109 3rd Ave S
Franklin, TN 37064
(615)791-3217

City of Franklin

Meeting Agenda

Franklin Municipal Planning Commission

Thursday, April 28, 2016 | **7:00 PM** | **Board Room**

Notice is hereby given that the Franklin Municipal Planning Commission will hold a regular meeting on Thursday, April 28, 2016, at 7:00 p.m. in the City Hall Board Room. Additional information can be found at www.franklintn.gov/planning.

The purpose of the meeting will be to consider matters brought to the attention of the Planning Commission and will include the following.

The typical process for discussing an item is as follows:

1. *Staff presentation,*
2. *Public comments,*
3. *Applicant presentation, and*
4. *Motion/discussion/vote.*

Applicants are encouraged to come to the meeting, even if they agree with the staff recommendation. The Planning Commission may defer or disapprove an application/request unless someone is present to represent it.

For accommodations due to disabilities or other special arrangements, please contact the Human Resources Department at (615) 791-3216, at least 24 hours prior to the meeting.

CALL TO ORDER

MINUTES

1. 16-0355 March 24, 2016 FMPC Minutes

Attachments: 3-24-16 FMPC Minutes

CITIZEN COMMENTS ON ITEMS NOT ON THE AGENDA

Open for Franklin citizens to be heard on items not included on this Agenda. As provided by law, the Planning Commission shall make no decisions or consideration of action of citizen comments, except to refer the matter to the Planning Director for administrative consideration, or to schedule the matter for Planning Commission consideration at a later date. Those citizens addressing the Planning Commission are required to complete a Public Comment Card in order for their name and address to be included within the official record.

ANNOUNCEMENTS

VOTE TO PLACE NON-AGENDA ITEMS ON THE AGENDA

The non-agenda process, by design, is reserved for rare instances, and only minor requests shall be considered. Non-agenda items shall be considered only upon the unanimous approval of all of the Planning Commission members.

16-0426 PUBLIC HEARING: Consideration of Resolution 2016-22 to be entitled "A Resolution, As Amended, Adopting A Plan Of Services For The Annexation Of 1845 Carters Creek Pike By The City Of Franklin, Tennessee"; (04-28-16 FMPC 9-0; 05-10-16 WS)

Sponsors: Ald. Ann Petersen

Attachments: Resolution 2016-22 1845 Carters Creek POS Revision 4-22-2016 Law Approve

1845 Carters Creek Pike POS Revision map

CONSENT AGENDA

The items under the consent agenda are deemed by the Planning Commission to be non-controversial and routine in nature and will be approved by one motion. The items on the consent agenda will not be individually discussed. Any member of the Planning Commission, City Staff, or the public desiring to discuss an item on the consent agenda may request that it be removed and placed on the regular agenda. It will then be considered in its printed order.

- *Initial Consent Agenda*
- *Secondary Consent Agenda- to include any items in which Commissioners recuse themselves*

SITE PLAN SURETIES

2. 16-0366 Alexander Plaza Subdivision, site plan, (Zaxby's); release the maintenance agreement for landscaping improvements. (CONSENT AGENDA)

3. 16-0367 Avalon PUD Subdivision, site plan, section 3, 97 dwelling units in 117 lots; release the maintenance agreement for landscaping improvements. (CONSENT AGENDA)

4. 16-0368 Avalon PUD Subdivision, site plan, section 5; release the maintenance agreement for landscaping improvements. (CONSENT AGENDA)

5. 16-0369 Cool Springs Corner Subdivision, site plan, lots 3 and 9 (Sam's/Jim N' Nicks Unified Plan); release the maintenance agreement for landscaping improvements. (CONSENT AGENDA)

6. 16-0370 Cool Springs East Subdivision, site plan, section 24, lots 11 and 703 (Hilton Garden Inn/Medical Office Building Unified Plan); release the maintenance agreement for landscaping lot 703 improvements. (CONSENT AGENDA)

7. 16-0371 Dallas Downs PUD Subdivision, site plan, section 2A, lot 28 (Heritage Church of Christ); accept the streets improvements, release the performance agreement and establish a maintenance agreement for one year. (CONSENT AGENDA)

8. 16-0372 Highlands at Ladd Park PUD Subdivision, site plan, sections 1 – 4; release the maintenance agreement for landscaping section 1, landscaping section 1 (street trees), landscaping section 3 and landscaping section 3 (street trees) improvements; accept the landscaping section 4 improvements, release the performance agreement and establish a maintenance agreement for one year. (CONSENT AGENDA)

9. 16-0373 Highlands at Ladd Park PUD Subdivision, site plan, section 8 and 9; release the maintenance agreement for landscaping street trees, landscaping open space section 1, part 8 and 9, and landscaping open space lot 2001 and 1047 improvements. (CONSENT AGENDA)

10. 16-0374 Jamison Station PUD Subdivision, site plan, section 1; release the maintenance agreement for landscaping (Phase 2) improvements. (CONSENT AGENDA)

11. 16-0375 McKays Mill PUD Subdivision, site plan, section 32 (Hadden Hall Area); accept the landscaping improvements, release the performance agreement and establish a maintenance agreement for one year. (CONSENT AGENDA)

12. 16-0376 Morningside PUD Subdivision, site plan, section 9, lot 21; release the maintenance agreement for landscaping and landscaping (retaining wall) improvements. (CONSENT AGENDA)

13. 16-0377 Through the Green PUD Subdivision, site plan, section 1 (The Grove at Shadow Green); release the maintenance agreement for streets improvements; accept the landscaping improvements, release the performance agreement and establish a maintenance agreement for one year. (CONSENT AGENDA)

14. 16-0378 Tywater Crossing PUD Subdivision, site plan, section 1; extend the performance agreement for landscaping improvements for six months. (CONSENT AGENDA)

15. 16-0379 Village at Clovercroft PUD Subdivision, site plan, sections 1 and 2; release the maintenance agreement for landscaping Phase 8 improvements. (CONSENT AGENDA)

16. 16-0380 Westhaven PUD Subdivision, site plan, section 10; release the maintenance agreement for landscaping (Phase 2) improvements. (CONSENT AGENDA)

17. 16-0381 Westhaven PUD Subdivision, site plan, section 17, revision 2; release the maintenance agreement for landscaping Phase 2 (north of Oleander) improvements. (CONSENT AGENDA)

18. 16-0382 Westhaven PUD Subdivision, site plan, section 19; release the maintenance agreement for landscaping Phase 2 (open space) improvements. (CONSENT AGENDA)

19. 16-0383 Westhaven PUD Subdivision, site plan, section 24; release the maintenance agreement for landscaping improvements. (CONSENT AGENDA)

REZONINGS AND DEVELOPMENT PLANS

20. 16-0332 Consideration Of Ordinance 2016-007, To Be Entitled, "An Ordinance To Rezone 1.1 Acres From Light Industrial (LI) District To Specific Development-Residential (SD-R 3.64) District For The Property Located At 405 Eddy Lane." (04/28/16 FMPC 8-0, 05-10-16 WS, 05-10-16 BOMA 7-0; 06/14/16 BOMA 2nd Reading 8-0) THIRD AND FINAL READING

Sponsors: Ald. Ann Petersen

Attachments: 2016-007 ORD Eddy Lane Rezoning_Law Approved 2
6083 Map Cottages at Eddy Lane Rezoning
6083 Rezone set

21. 16-0336 PUBLIC HEARING: Consideration Of Resolution 2016-19, To Be Entitled: "A Resolution Approving A Development Plan For Cottages At Eddy Lane PUD Subdivision, For The Property Located At 405 Eddy Lane." (04/28/16 FMPC 8-0; 5/10/16 WS)

Sponsors: Ald. Ann Petersen

Attachments: 2016-19 RES Cottages at Eddy Lane PUD Development Plan_Law Approved 2
6084 Map Cottages at Eddy Lane DP
6084 Cottages at Eddy Lane DP Conditions of Approval_01
Cottages at Eddy Lan Dev Plan FULL Set
Cottages at Eddy Lan Dev Plan Site Layout Sheet
Cottages at Eddy Lan Dev Plan Elevations

22. 16-0334 PUBLIC HEARING: Consideration Of Ordinance 2016-008, To Be Entitled, "An Ordinance To Rezone 30.39 Acres From General Commercial (GC) District To Specific Development-Residential (SD-R 10) District For The Property Located West Of Interstate 65, At 840 And 880 Oak Meadow Drive." (06-23-16 FMPC Recommended Disapproval 7-1; 07-12-16 BOMA WS; 08-09-16 BOMA 1st Reading 4-3) SECOND OF THREE READINGS

Sponsors: Ald. Ann Petersen

Attachments: 6085 Map Epoch Development PUD Subdivision Rezoning
2016-008 ORD_ Epoch Rezoning_Law Approved 3
Epoch Rezoning Set
Impact Study (5.26.16) - WITHOUT ACCESS ON SRO
Staff report and attachments from 4.28.16 FMPC Agenda item

23. 16-0342 PUBLIC HEARING: Consideration Of Resolution 2016-20, To Be Entitled: "A Resolution Approving A Development Plan For Epoch Development PUD Subdivision, For The Property Located West Of Interstate 65, At 840 And 880 Oak Meadow Drive." (06-23-16 FMPC Recommended Disapproval 7-1; 07-12-16 WS)

Sponsors: Ald. Ann Petersen and Amy Diaz-Barriga

Attachments: 6086 Map Epoch Development PUD Subdivision DP
6086 Conditions of Approval_02
2016-20 RES Epoch PUD Development Plan_Law Approved 2
Epoch PUD Site layout sheets
Epoch PUD elevations and perspectives
Epoch PUD FULL Resubmittal
Impact Study (5.26.16) - WITHOUT ACCESS ON SRO
4.28.16 FMPC item.staff report and attachments

SITE PLANS, PRELIMINARY PLATS, AND FINAL PLATS

24. 16-0073 Gist Street PUD Subdivision, final plat, creating 4 single-family lots, located at 1367 Columbia Avenue. (CONSENT AGENDA)

Attachments: MAP 6011 Gis Street PUD Subd, FP
6011 Gist Street FP Conditions of Approval_01
SIGNED plat COF 6011

25. 16-0314 Echelon PUD Subdivision, Final Plat, Section 1, Revision 1, lot line shifts within 10 lots, located at Carothers Road. (Consent Agenda)

Attachments: 6059 Echelon PUD Subd FP Sec 1 Rev 1 Conditions of Approval_01.pdf
6059 Echelon PUD Subd Final Plat Sec 1 Rev 1 Map.pdf
Echelon PUD Subdivision, final plat, section 1, revision 1 - submittal 003.pdf

26. 16-0315 Tap Root Hills PUD Subdivision, final plat, section 1, creating 39 single-family lots and 4 open space lots on 20.15 acres, located at 4101 Clovercroft Road. (Consent Agenda)

Attachments: 6081 Tap Root Hills Subd FP Sec 1 Conditions of Approval_01.pdf
6081 Tap Root Hills FP Sec 1 Map.pdf
Tap Root Hills Sec 1 final plat 2016-04-07-signed.pdf

27. 16-0316 Highlands at Ladd Park PUD Subdivision, final plat, section 28, creating 26 single-family lots and 1 open space lot, located along Carothers Parkway. (Consent Agenda)

Attachments: 6088 Highlands at Ladd Park PUD Sub FP Sec 28 Conditions of Approval_01.p
6088 Highlands at Ladd Park FP Sec 28 Map.pdf
2015165 ladd sec 28 plat-COF # 6088 RESUBMITED 4-7-16.pdf

28. 16-0317 Highlands at Ladd Park PUD Subdivision, final plat, section 40 (Amenity Center), creating one lot, located along Carothers Parkway. (Consent Agenda)

Attachments: 6089 Highlands at Ladd Park PUD Sub FP Sec 40 Conditions of Approval_01.p
6089 Highlands at ladd park section 40 FP Map.pdf
2015166-sec 40 plat amenities center-cof # 6089-resubmitted 4-7-16.pdf

29. 16-0320 Family Legacy PUD Subdivision, site plan, lot 1, construction of a 10,500 square foot funeral home on 3.80 acres, located at 554 Franklin Road. (Consent Agenda)

Sponsors: Franklin Municipal Planning Commission and Josh King

Attachments: 6072 Map_Family Legacy PUDSP.pdf
Layout_Family Legacy Lot 1 Site Plan - Resubmittal 4-7-16.pdf
Elevations Family Legacy Lot 1 Site Plan - Resubmittal 4-7-16-2.pdf
6072_FamilyLegacyPUD_Conditions of Approval_01.pdf
Family Legacy Lot 1 Site Plan - Resubmittal 4-7-16.pdf

30. 16-0321 Harpeth Square PUD Subdivision, final plat, section 1, creation of two lots for parking and building, located at the intersection of 2nd Avenue and East Main Street (Consent Agenda)

Sponsors: Franklin Municipal Planning Commission and Josh King

Attachments: 6074_HarpethSquare_Conditions of Approval_01.pdf
MAP_6074HarpethSquarePUDSubdivision.pdf
7.4.2016 HS Final Plat Sect 1 6074.pdf

31. 16-0322 Medcore Medical Office Subdivision, Site Plan, Phase 1, Lot 3, Revision 1, (Scott Hamilton Proton Therapy Centre), 110,030 square feet of commercial office space on located at 4588 Carothers Parkway on 11.62 acres, located between Liberty Pike and Murfreesboro Road across from Williamson Medical Outpatient Building, (Consent Agenda)

Sponsors: Franklin Municipal Planning Commission and Josh King

Attachments: 6076 Map_Medcore Medical.pdf
6076_MedcoreMedical_Conditions of Approval_01.pdf
6076_FullSet.pdf
6076_Elevations.pdf
6076_SiteLayout.pdf

32. 16-0323 Westhaven PUD Subdivision, Section 45, final plat, creation of 46 new detached residential lots on 9.89 acres, located west of Championship Boulevard and Stonewater Boulevard (Consent Agenda)

Sponsors: Franklin Municipal Planning Commission and Josh King

Attachments: 6077 Westhaven PUD SUbdivision Sec45 Map.pdf
6077_COA-WesthavenPUD Subdivision FPSec45.pdf
6077_WesthavenSec45_FP.pdf

33. 16-0251 Branch Creek Crossing PUD Subdivision, Final Plat, creating 3 buildable lots and 2 open space lots, on 19.1 acres, located at 574 Franklin Road. (Consent Agenda)

Attachments: 6045 Branch Creek Crossing PUD Subd FP Conditions of Approval_01.pdf
6045 Branch Creek Crossing PUD Subd Final Plat Map.pdf
Branch Creek Crossing PUD Subd Final Plat.pdf

34. 16-0346 Township PUD Subdivision, site plan, section 1, a 59,736 square foot assisted living facility on 17.30 acres, located at 1127 Murfreesboro Road, 1st site plan extension request. (CONSENT AGENDA)

Attachments: Site Plan Extension Request 040516

35. 16-0344 Watson Glen Subdivision, final plat, Section 1, Revision 17, resubdivision of Lot 24 into 2 lots, on 20.54 acres, located at Oak Meadow Drive. (Consent Agenda)

Attachments: 4.28.16 FMPC item. staff report and attachments
6091 MAP Watson Glen Subd Sec 1 Rev 17 Final Plat
Final Plat WATSON GLEN SEC 1 REV 17
6091 Conditions of Approval_02

36. 16-0343 Wynfield Village Subdivision, preliminary plat, 13-lot subdivision, on 8.18 acres, located at 821 Murfreesboro Road.

Attachments: 6092 MAP Wynfield Subd Preliminary Plat
6092 Wynfield Village PP Conditions of Approval_01
Wynfield Plan Full Set
Wynfield Plan Site Layout Sheet

37. 16-0388 Carothers Crossing East PUD Subdivision, site plan, lot 1, construction of a 120,577 square foot commercial building on 6.01 acres, located at the intersection of Liberty Pike and Carothers Parkway, with 1 design modification.

Sponsors: Franklin Municipal Planning Commission and Josh King

Attachments: Elevations_6071_Carotherscrossing.pdf
CompleteSetofPlans_6071_Carothers Crossing East PUD.pdf
SiteLayout Sheet_6071_CarothersCrossingPUD.pdf
MAP_6071 Carothers Crossing East.pdf
6071_CarothersCrossingEast_Conditions of Approval_01.pdf

ORDINANCE AND TEXT AMENDMENTS

38. 16-0345 Consideration Of Ordinance 2016-010, To Be Entitled: “An Ordinance To Amend Chapter 5 Of The Zoning Ordinance Of The City Of Franklin, Tennessee, Subsection 5.8.5, Pertaining To Floodplain Protection.” (04/28/16 FMPC 9-0, 05-10-16 WS, 05-10-16 BOMA 7-0; 06/14/16 BOMA 2nd Reading 8-0) THIRD AND FINAL READING

Sponsors: Ald. Ann Petersen

Attachments: Ordinance 2016-010_Amend ZO to add FIRM Panels 184F_355F_360F_Law A
Ordinance 2016-010 FIRM Panel Exhibit

39. 16-0363 Consideration of Ordinance 2015-80, As Amended, To Be Entitled, “An Ordinance To Amend The Zoning Ordinance Of The City Of Franklin, Tennessee, To Update The Development Standards And Sub-District Boundaries For The CAO-Columbia Avenue Overlay District By Amending Chapter 3, Subsection 3.4.7.”

Sponsors: Ald. Ann Petersen

Attachments: Ordinance 2015-80 3rd Reading 6.28.2016
CAO Map
Draft Ordinance 2015-80 CAO District Text Amendment Law Approved 3 As Am
Draft Ordinance 2015-80 CAO District Text Amendment.Law Approved 2

40. 16-0426 PUBLIC HEARING: Consideration of Resolution 2016-22 to be entitled "A Resolution, As Amended, Adopting A Plan Of Services For The Annexation Of 1845 Carters Creek Pike By The City Of Franklin, Tennessee"; (04-28-16 FMPC 9-0; 05-10-16 WS)

Sponsors: Ald. Ann Petersen

Attachments: Resolution 2016-22 1845 Carters Creek POS Revision 4-22-2016 Law Approve
1845 Carters Creek Pike POS Revision map

NON-AGENDA ITEMS

ANY OTHER BUSINESS

ADJOURN

HISTORIC
FRANKLIN
TENNESSEE

City of Franklin

109 3rd Ave S
Franklin, TN 37064
(615)791-3217

Meeting Minutes - Draft

Franklin Municipal Planning Commission

Thursday, March 24, 2016 | **7:00 PM** | **Board Room**

CALL TO ORDER

Present 7 - Commissioner Harrison, Commissioner Petersen, Commissioner McLemore, Commissioner Franks, Commissioner Gregory, Commissioner Lindsey, and Commissioner Hathaway

Absent 2 - Commissioner Allen, and Commissioner Orr

MINUTES

1. February 25, 2016 FMPC Minutes

Attachments: 02-25-16 FMPC Minutes

Commissioner Harrison moved, seconded by Commissioner Petersen to approve the February 25, 2016, Minutes as presented. The motion carried by the following vote:

Aye: 7 - Commissioner Harrison, Commissioner Petersen, Commissioner McLemore, Commissioner Franks, Commissioner Gregory, Commissioner Lindsey, and Commissioner Hathaway

Absent: 2 - Commissioner Allen, and Commissioner Orr

Chairing: 0

CITIZEN COMMENTS ON ITEMS NOT ON THE AGENDA

ANNOUNCEMENTS

VOTE TO PLACE NON-AGENDA ITEMS ON THE AGENDA

CONSENT AGENDA

Approval of the Consent Agenda

A motion was made by Commissioner Harrison, seconded by Commissioner McLemore, to approve items 3, 4, 8, and items 10 through 13 on the Consent Agenda. The motion carried by the following vote:

Aye: 7 - Commissioner Harrison, Commissioner Petersen, Commissioner McLemore, Commissioner Franks, Commissioner Gregory, Commissioner Lindsey, and Commissioner Hathaway

Absent: 2 - Commissioner Allen, and Commissioner Orr

Chairing: 0

Approval of the Consent Agenda

A motion was made by Commissioner Harrison, seconded by Commissioner Lindsey, to approve items 2, 6, and 7 on the Consent Agenda. The motion carried by the following vote:

Aye: 6 - Commissioner Harrison, Commissioner Petersen, Commissioner McLemore, Commissioner Franks, Commissioner Lindsey, and Commissioner Hathaway

Absent: 2 - Commissioner Allen, and Commissioner Orr

Recused: 1 - Commissioner Gregory

Chairing: 0

Approval of the Consent Agenda

A motion was made by Commissioner Harrison, seconded by Commissioner McLemore, to approve item 9 on the Consent Agenda. The motion carried by the following vote:

Aye: 6 - Commissioner Harrison, Commissioner Petersen, Commissioner McLemore, Commissioner Franks, Commissioner Gregory, and Commissioner Lindsey

Absent: 2 - Commissioner Allen, and Commissioner Orr

Recused: 1 - Commissioner Hathaway

Chairing: 0

SITE PLAN SURETIES

2. Berry Farms Town Center PUD Subdivision, site plan, section 1, revision 1, lot 62 (Amenity Center); accept the drainage improvements, release the performance agreement and establish a maintenance agreement for one year. (CONSENT AGENDA)

This Planning Item was approved.

3. Generals Retreat PUD Subdivision, site plan; extend the performance agreement for sidewalk and streets improvements. (CONSENT AGENDA)

This Planning Item was approved.

4. Through the Green PUD Subdivision, site plan, section 1 (The Grove at Shadow Green); release the maintenance agreement for drainage improvements. (CONSENT AGENDA)

This Planning Item was approved.

REZONINGS AND DEVELOPMENT PLANS

5. *Consideration Of Ordinance 2016-001, "An Ordinance Approving A Special Permit for Cul2vate For The Purpose Of Operating An Agricultural Use On 1.21 Acres, Located At 215 Granbury Street."; Establishing a Public Hearing for May 10, 2016. (3-24-16 FMPC 7-0, 04-12-16 WS) FIRST OF THREE READINGS

Attachments: 2016-001 Special Permit Ordinance Cul2vate (005)with attachments
Law Approved 2
Map Cul2vate Special Permit
Cul2vate Conditions of Approval_01.pdf
Cul2vate Plans.pdf

Mr. Baumgartner stated that the site would have two greenhouses and outdoor gardening beds for the growing of produce.

Ordinance 2016-001 gives greater detail of the specifications of what the Special Permit will allow, including hours of operation, parking, loading zones, etc., and approval was recommended.

Chair Hathaway asked for citizen comments. There were none.

Mr. Joey Lankford, of Franklin, represented the item and stated that he had recently moved back to Franklin from Capetown, South Africa. He had started a company, called "Cul2vate", that he would like to establish at 215 Granbury Street. He had previously grown vegetables overseas and had come back to launch a few sites in Middle Tennessee. He had been through the process of trying to set up a food-growing operation at this address that would engage the community with local vegetables and be a conduit for local delivery of nutritious foods. It would also provide a training platform for people who want to learn about agriculture and employment-related skills, and be job-placed at the end of four months. They have job-placement services, such as Riverbend Nurseries and Belden Farms. They will be trying to get people to go to these places at the end of the four months. He requested approval of Ordinance 2016-001.

Commissioner Harrison moved, seconded by Commissioner McLemore, that approval of Ordinance 2016-001 be recommended. The motion carried by the following vote:

Aye: 7 - Commissioner Harrison, Commissioner Petersen, Commissioner McLemore, Commissioner Franks, Commissioner Gregory, Commissioner Lindsey, and Commissioner Hathaway

Absent: 2 - Commissioner Allen, and Commissioner Orr

Chairing: 0

SITE PLANS, PRELIMINARY PLATS, AND FINAL PLATS

6. Berry Farms Town Center PUD Subdivision, final plat, section 7, creating 99 residential lots, 10 open space lots, 3 access lots on 34.06 acres, located near Old Peytonsville Road and Lewisburg Pike. (CONSENT AGENDA)

Attachments: MAP_6035 BFTC Sec7 FP.pdf
PLAT_6035_BFTC_Sec7.pdf
COA_6035_BFTCSec7.pdf

This Planning Item was approved.

7. Berry Farms Town Center PUD Subdivision, final plat, section 9, lot 901 and lot 902, revision 1, revising two lots to record drainage, access, and utility easements. (CONSENT AGENDA)

Attachments: MAP_6036 BFTC Sec9 FP.pdf
Plat_6036_BFTC_Lot901+902.pdf
COA_6036_BFTCLot901+902.pdf

This Planning Item was approved.

8. Carothers Crossing East Subdivision, final plat, creating 4 commercial lots on 6.01 acres located at the northeast corner of Liberty Pike and Carothers Parkway. (CONSENT AGENDA)

Attachments: MAP_6039CarothersCrossingEastFP.pdf
PLAT_6039_CarothersCrossingEast.pdf
COA_6039_CarothersCrossingEastFP.pdf

This Planning Item was approved.

9. Harpeth Square PUD Subdivision, final plat, combining 9 commercial lots into two buildable lots to support the Harpeth Square PUD Development located in the block along East Main Street between 2nd Avenue North and Bridge Street (CONSENT AGENDA)

Attachments: MAP_6041 Harpeth Square PUD Subdivision Final Plat.pdf
PLAT_6041_HarpethSquarePUD.pdf
COA_6041_HarpethSquare.pdf

This Planning Item was approved.

10. Highlands at Ladd Park PUD Subdivision, section 18, final plat, 23-lot subdivision, on 6.67 acres, located at Barlow Drive. (CONSENT AGENDA)

Attachments: 2016007-LADD SEC 18 PLAT-COF#6049 RESUBMITTED 3-3-16

MAP 6049 Highlands at Ladd Park, final plat , section 18

COF 6049 Conditions of Approval

This Planning Item was approved.

11. Highlands at Ladd Park PUD Subdivision, section 26, final plat, creating 37 residential lots and 3 open space lots, on 21.7 acres, located at Carothers Parkway. (CONSENT AGENDA)

Attachments: MAP 6050 Highlands at Ladd Park, final plat, section 26

Highlands at Ladd Park PUD Subdivision, final plat, section 26 - submittal 002

COF 6050 Conditions of Approval

This Planning Item was approved.

12. Huffines Development Subdivision, final plat, consolidation of 2 lots, on 6.37 acres, located at 1340 Huffines Ridge Drive. (CONSENT AGENDA)

Attachments: MAP 6052 Huffines Development Subdivision

Huffines Development Subdivision, final plat - submittal 002

COF 6052 Conditions of Approval

This Planning Item was approved.

13. Lockwood Glen PUD Subdivision, Final Plat, Section 7, creating 30 lots on 12.65 acres, located along South Carothers Road. (CONSENT AGENDA)

Attachments: Lockwood Glen PUD Subd Sec 7 Final Plat.pdf

Lockwood Glen FP Sec 7 Conditions of Approval_01.pdf

Lockwood Glen FP Sec 7 Plans.pdf

This Planning Item was approved.

NON-AGENDA ITEMS

ANY OTHER BUSINESS

ADJOURN

There being no further business, the meeting adjourned at 7:07 p.m.

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Chair Mike Hathaway

RESOLUTION 2016-22

A RESOLUTION, AS AMENDED, ADOPTING A PLAN OF SERVICES FOR THE ANNEXATION OF 1845 CARTERS CREEK PIKE BY THE CITY OF FRANKLIN, TENNESSEE.

WHEREAS, *Tennessee Code Annotated* (T.C.A.) § 6-51-102 requires that a plan of services be adopted by the municipal governing body prior to passage of an annexation ordinance.

1845 CARTERS CREEK PIKE

The proposed annexation area of 75.69 acres located west of Carters Creek Pike and southwest of Downs Boulevard and adjoining the City limits within the southwestern part of the Franklin Urban Growth Boundary (UGB). A map is attached as Exhibit A. The area comprises a total of 75.69 acres in one parcel with one owner, Heavy Helium, LLC ("Owner"). The Applicant Monte and Camille Schaefer are in process of purchasing the property from the Owner. The Applicant has requested annexation by the City of Franklin. The area currently is vacant ("Property").

WHEREAS, the Property is contiguous to the City of Franklin City limits.

WHEREAS, it is believed in the best interest of the City of Franklin to annex such area to provide for future development in accordance with City standards.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

Section 1. Pursuant to the provisions of T.C.A. § 6-51-102, there is hereby adopted, for the area bounded as described above, the following Plan of Services:

Water

The Property is located within the City of Franklin Utility District. The existing/proposed zoning is Agricultural. As long as the proposed use remains agricultural, the Property Owner shall be allowed to utilize the existing well water onsite and the City of Franklin will not be responsible for providing water service.

If the existing/proposed use of the Property changes, the Property Owner shall be responsible for the engineering, design and construction of a public water main. Currently this would require an extension from the intersection of Bradford Drive and West Main Street along Carters Creek Pike and shall be extended across the frontage of their Property (approximately 1,900 LF). It shall be the responsibility of the Property Owner to ensure that adequate water for both domestic use and fire protection is provided to the site. The City does not allow water mains within state right-of-way. The Property Owner shall be required to acquire the necessary offsite easements to provide service to the Property.

Reclaimed Water

According to the City of Franklin's Municipal Code, reclaimed water systems need to be extended to a development if the development is within 1,000 feet of an existing reclaimed

Law Dept. approved 04.28.16

water line. In the case of this Property, a several-mile extension would be required to serve the Property. For this reason, reclaimed water will not be required to be extended to the Property.

Wastewater

The majority of the Property lies within the West Basin as defined in the City of Franklin Sanitary Sewer Basin Study. The Property Owners are anticipated to construct a horse barn, a track building, an indoor riding ring, and three care-taker apartments creating very little impact on the sanitary sewer collection system. The existing/proposed zoning is Agricultural. As long as the existing/proposed use remains agricultural, the Property Owner shall be allowed to construct and operate a septic system approved by Williamson County Board of Health.

The City Administrator may require the Property Owner to connect to the public sanitary sewer system based on the following reasons:

1) The proposed/existing use changes and increase the impact on the proposed septic system.
2) The Property Owner's private sewage disposal system no longer complies with the Williamson County Board of Health regulations.
3) The conditions on the Property pose an unacceptable risk to the public health, safety and welfare.

If the Property Owner is required to connect to the public sewer system they will be responsible for the engineering, design, easement acquisition, connection fees and construction of the public main. The time frame associated with this connection shall be determined by the City Administrator.

Stormwater

The Property Owner shall be responsible for the engineering, design and construction of the necessary stormwater infrastructure for the development of the property and shall comply with all requirements as outlined in the Franklin Municipal Code. As the Property develops, the City of Franklin will charge prevailing stormwater user fees per policies and procedures as outlined in the Franklin Municipal Code.

Streets

Access to the Property shall be provided on Carters Creek Pike. Carters Creek Pike is classified as a Minor Arterial in the City of Franklin Major Thoroughfare Plan. The Property Owner shall be required to dedicate the necessary future right-of-way for Carters Creek Pike to allow the City to make future improvements as this area of the City continues to develop. The Property Owner shall be required to dedicate 67.5 feet of right-of-way from the existing centerline of Carters Creek Pike as part of the final plat.

The future extension of Mack Hatcher Parkway goes through the western portion of this Property. The Property Owner shall be required to reserve 225 feet of right-of-way following the proposed centerline of the Mack Hatcher Parkway Extension project. This shall be completed as part of the final plat.

The Property Owner shall be required to complete a traffic impact study as part of the development of this property. Additional requirements will be determined as part of the site plan review and approval process.

Traffic Control

Traffic signals, traffic signs, street markings, and other traffic-control devices will be installed as the need is established by appropriate study and traffic standards. New development after the effective date of annexation shall comply with City regulations governing traffic markings.

Street Lighting

No off-site street lighting is proposed. Street lighting within new developments shall be funded and installed by the Property Owner per City policy.

Street Name Signs

No additional street name signs in the area have been deemed necessary. New development shall install street-name signs per City policy.

Planning and Zoning

The Planning and Zoning jurisdiction will extend to the annexed area on the effective date of the annexation. City Planning will thereafter encompass the annexed area.

Fire Protection

Fire protection by the present personnel and equipment of the Franklin Fire Department will be provided on and after the effective date of annexation. No additional staffing or equipment will be necessary to serve the annexation area at this time. Fire protection will be provided by the City of Franklin, TN. Due to the proposed agricultural use, the site will not have public water available for fire suppression. All agricultural buildings shall be built out of non-combustible material. Any proposed residential units shall have a sprinkler system connected to the proposed well.

Police Protection

Police patrol and response to calls by the Franklin Police Department will be provided on and after the effective date of annexation. Police services will be provided with existing personal and equipment.

Building and Code Inspection Services

Any Building and Code inspection services will begin in the annexed area on the effective date of annexation. New development after the effective date of annexation shall comply with City building codes. New development shall pay all applicable fees and permits for inspection services.

Garbage and Recycling Pickup and Environmental

The Sanitation Department will begin pick-up, per their regulations, on the effective day of annexation.

City of Franklin Land Use Plan

SOUTHALL CHARACTER AREA

The Southall Character Area straddles Carters Creek Pike and Columbia Avenue to the southwest and south of downtown Franklin. To the north, the area is bound by the West Harpeth and Central Franklin Character Areas, to the east by the Carnton and Goose Creek Character Areas and to the south and west by the UGB. There are approximately 4,230 acres in the area, and large residential lots and vacant land account for a majority of that acreage. There are almost 400 acres dedicated to industrial uses, which is more than half of the region's total (although much of this is the rock quarry), and there is also some commercial and office space. There is no

Attached Residential in this area. Rolling Meadows Subdivision, in the adjacent West Harpeth Character Area, is an example of a desirable affordable neighborhood. Affordable housing is an important element that should be provided for in the area. The lack of sewer infrastructure limits residential development in the southern portion of the area, unless advanced on-site technology is permitted. Other areas of inadequate infrastructure include the need for additional collector roads necessary to access undeveloped pockets of land. The Southall Character Area has rich natural resources including rolling terrain with significant areas constrained by steep slopes (twenty percent or greater), hilltops and significant mature tree cover that provides habitat for wildlife. These features should be preserved to the greatest extent possible to maintain the environmental quality and scenic views within the area. The Lula Lane incinerator is no longer operating and provides an opportunity for redevelopment. Whenever possible, opportunities to create parks and to preserve open space should be pursued. Connectivity of these elements as part of a regional network is important.

SPECIAL AREA 4
1. This area shall have vehicular and pedestrian connections to Westhaven and Willow Springs PUD Subdivisions.

VISION
The Southall Character Area will remain semi-rural with strong preservation of natural features, particularly of hillsides and hilltops. Development will respect and enhance the character of the area while creating neighborhoods and preserving natural features, such as steep slopes, hilltops and floodplains.

SECTION 2. This Resolution shall be effective from and after its adoption.

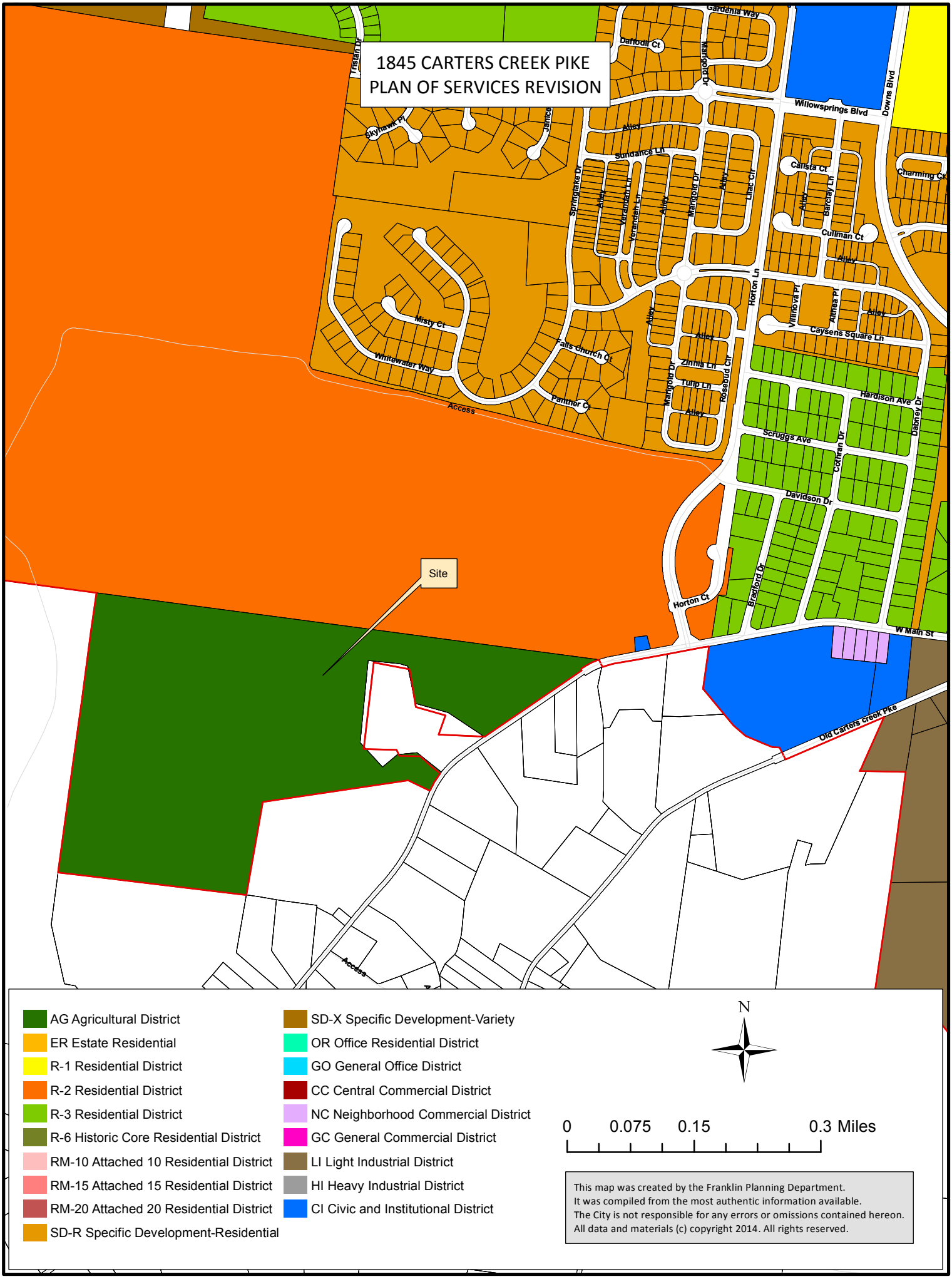
ADOPTED THIS _____.

_____ _____

ERIC S. STUCKEY **DR. KEN MOORE**
City Administrator Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney


1845 CARTERS CREEK PIKE
PLAN OF SERVICES REVISION
Site
Access
Access
Gardenia Way
Daffodil Ct
Marigold Dr
Willowsprings Blvd
Downs Blvd
Skyhawk Pl
Janice
Alley
Sundance Ln
Springlake Dr
Veramedan Cir
Lilac Cir
Callista Ct
Barclay Ln
Charming Ck
Cullman Ct
Horton Ln
Misty Ct
Whitewater Way
Falls Church Ct
Panther Ct
Zinnia Ln
Tulip Ln
Rosebud Cir
Villinova Pl
Almea Pl
Caysens Square Ln
Hardison Ave
Dabney Dr
Scruggs Ave
Cothran Dr
Davidson Dr
Bradford Dr
Horton Ct
W Main St
Old Carters Creek Pike
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
0.075
0.15
0.3 Miles
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It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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ORDINANCE 2016-007

TO BE ENTITLED, "AN ORDINANCE TO REZONE 1.1 ACRES FROM LIGHT INDUSTRIAL (LI) DISTRICT TO SPECIFIC DEVELOPMENT-RESIDENTIAL (SD-R 3.64) DISTRICT FOR THE PROPERTY LOCATED AT 405 EDDY LANE."

WHEREAS, the City of Franklin, Tennessee, encourages responsible growth and the sensible transition of land uses and densities; and

WHEREAS, the Specific Development-Residential district provides zoning for land uses compatible with both the Franklin Land Use Plan and surrounding development; and

WHEREAS, the Board of Mayor and Alderman (BOMA) of the City of Franklin, Tennessee, adopted Resolution 2016-19, approving a Plan Unit Development (PUD) Development Plan as required by the Franklin Zoning Ordinance; and

WHEREAS, the zoning has been reviewed and approved by BOMA after a public hearing and a recommendation by the Franklin Municipal Planning Commission.

NOW THEREFORE BE IT ORDAINED BY THE BOARD OF MAYOR AND ALDERMAN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That the following described property shall be, and is hereby, rezoned from its present zoning classification of **LI** District to **SD-R(3.64)** District:

PREMISES CONSIDERED

Map-Parcel	Acres
78-71.00	1.1
Total	1.1

Legal Description provided:

BEING A TRACT OF LAND AS SHOWN ON PROPERTY MAP 78, ASSESSOR'S OFFICE AND LYING WHOLLY WITHIN THE 9th CIVIL DISTRICT OF WILLIAMSON COUNTY, FRANKLIN, TENNESSEE. BOUNDED IN GENERAL BY EDDY LANE ON THE WEST; ARROW MOLDED PLASTICS, INC. ON THE NORTH AND EAST; LOT 7 OF HICKORY END ESTATES ON THE SOUTH, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN EXISTING CONCRETE MONUMENT ON THE EAST SIDE OF EDDY LANE (15.87' FROM THE CENTER), THE NORTHWEST CORNER OF LOT 7 OF HICKORY END ESTATES THENCE LEAVING LOT 7 AND WITH THE EAST SIDE OF EDDY LANE N09°57'36"E 217.96' TO AN EXISTING CONCRETE MONUMENT, THE SOUTH WEST CORNER OF ARROW MOLDED PLASTICS, INC. (REF. DEED BOOK 1145 PAGE 757 R.O.W.C.); THENCE LEAVING EDDY

LANE AND WITH THE SOUTH AND WEST LINES OF SAID ARROW PLASTICS S80°14’02”E 225.24’ TO AN EXISTING IRON PIN; THENCE S10°13’17”W 196.34’ TO AN EXISTING IRON PIN; THENCE N80°12’51”W 40.09’ TO AN EXISTING IRON PIN; THENCE S09°50’23”W 22.01’ TO AN EXISTING IRON PIN IN THE NORTH LINE OF THE AFOREMENTIONED LOT 7 OF HICKORY END ESTATES; THENCE WITH THE NORTH LINE OF LOT 7, N80°07’00”W 184.30’ TO THE POINT OF BEGINNING, CONTAINING 1.10 ACRES, MORE OR LESS, AND BEING THE WALTER LEE SMITHSON AND OVELLA S. SMITHSON LIVING TRUST PROPERTY AS RECORDED IN DEED BOOK 1300 PAGE 544 REGISTER’S OFFICE, ACCORDING TO A SURVEY BY RANDOLPH L. CHAPDELAINE R.L.S.#1444, 7376 WALKER ROAD, FRANKLIN, TENNESSEE 37062 AND DATED MAY 15, 2008.

SECTION II: That the attached Location Map shall serve the purpose of further delimiting the geographical boundaries as described by this Ordinance.

SECTION III. BE IT FINALLY ORDAINED by the Board of Mayor and Aldermen of the City of Franklin, Tennessee, that this Ordinance shall take effect from and after its passage on third and final reading, the health, safety, and welfare of the citizens requiring it.

ATTEST:

By: _____
Eric Stuckey
City Administrator/Recorder

CITY OF FRANKLIN, TENNESSEE:

By: _____
Dr. Ken Moore
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

PLANNING COMMISSION RECOMMENDED: _____

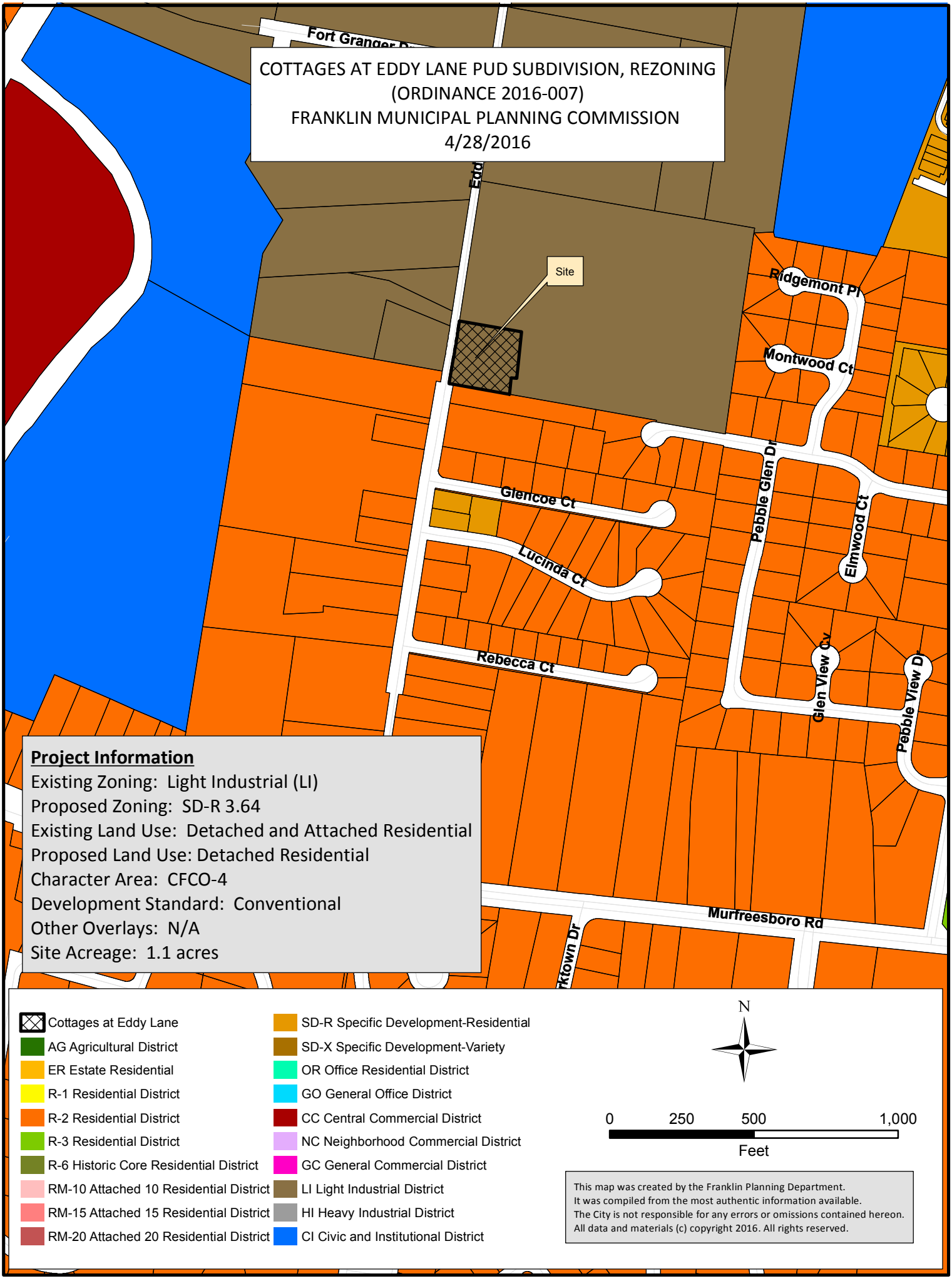
PASSED FIRST READING: _____

PUBLIC HEARING HELD: _____

PASSED SECOND READING: _____

PASSED THIRD READING: _____

Law Dept. approved 04.14.16


COTTAGES AT EDDY LANE PUD SUBDIVISION, REZONING
(ORDINANCE 2016-007)
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/2016
Site
Ridgemont Pl
Montwood Ct
Glencoe Ct
Lucinda Ct
Pebble Glen Dr
Elmwood Ct
Rebecca Ct
Glen View Cv
Pebble View Dr
Murfreesboro Rd
Project Information
Existing Zoning: Light Industrial (LI)
Proposed Zoning: SD-R 3.64
Existing Land Use: Detached and Attached Residential
Proposed Land Use: Detached Residential
Character Area: CFCO-4
Development Standard: Conventional
Other Overlays: N/A
Site Acreage: 1.1 acres
Cottages at Eddy Lane
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0 250 500 1,000
Feet
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It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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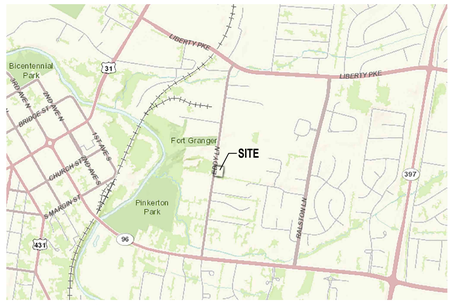
COTTAGES AT EDDY LANE

REZONING REQUEST

COF # 6083
MAP 78, PARCEL 71.00
FRANKLIN, TENNESSEE
CIVIL DISTRICT 9

SHEET INDEX

C 0.0 COVER SHEET
C 1.0 OVERALL EXISTING CONDITIONS PLAN
C 1.1 ENLARGED EXISTING CONDITIONS PLAN



VACINITY MAP
1" = 1,500' APPROX

N

LANDSCAPE ARCHITECT/PLANNER
GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY SUITE 200
FRANKLIN TN 37064
GREG GAMBLE, RLA (615) 975-5765
EMAIL ADDRESS: greggamble209@gmail.com

GDC GAMBLE DESIGN COLLABORATIVE

COTTAGES AT EDDY LANE
REZONING REQUEST
COF # 6083
FRANKLIN, TENNESSEE

SITE DATA:

PROJECT NAME:	COTTAGES AT EDDY LANE
PROJECT NUMBER:	6083
SUBDIVISION:	NA
LOT NUMBER:	NA
ADDRESS:	405 EDDY LANE,
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 78, PARCEL 71.00
EXISTING ZONING:	LIGHT INDUSTRIAL
PROPOSED ZONING:	SD-R(3.64)
CHARACTER AREA OVERLAY:	CFCO-4
OTHER APPLICABLE OVERLAYS	NONE
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
TOTAL ACREAGE:	1.1 AC
TOTAL SQUARE FOOTAGE:	48,156 SF
MINIMUM REQUIRED SETBACKS:	
FRONT YARD:	35'
REAR YARD:	30'
SIDE YARD:	MIN 7.5' 12' BETWEEN STRUCTURES
OWNER / APPLICANT:	AVENUE 11 DEVELOPMENT
ADDRESS:	1577 WOODMONT BLVD. NASHVILLE, TN 37215
OWNER:	(615) 972-9568
EMAIL:	kurt@ave11dev.com
CONTACT:	KURT DENNY
ENGINEER:	KIMLEY-HORN
ADDRESS:	214 OCEANSIDE DRIVE, NASHVILLE, TN 37204
PHONE:	(615) 564-2701
EMAIL:	ryan.mcmaster@kimley-horn.com
CONTACT:	RYAN MCMASTER
LANDSCAPE ARCHITECT :	GAMBLE DESIGN COLLABORATIVE
ADDRESS:	144 S.E. PARKWAY, SUITE 200, FRANKLIN, TN 37064
PHONE:	(615) 975-5765
FAX:	(615) 790-1350
EMAIL:	greg.gamble@gdc-tn.com
CONTACT:	GREG GAMBLE

PRE-APPLICATION SUBMITTAL	FEBRUARY 9, 2016
INITIAL SUBMITTAL	MARCH 14, 2016
RESUBMITTAL	APRIL 7, 2016
REVISION	-
REVISION	-

GRAPHIC SCALE 1"=40'

0 20 40 80 160

THE INFORMATION SHOWN ON THIS PLAN IS BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIP ZONE 4100 AND NAD 83 DATUM.

LEGAL DESCRIPTION

BEING A TRACT OF LAND AS SHOWN ON PROPERTY MAP 78, ASSESSOR'S OFFICE AND LYING WHOLLY WITHIN THE 9th CIVIL DISTRICT OF WILLIAMSON COUNTY, FRANKLIN, TENNESSEE. BOUNDED IN GENERAL BY EDDY LANE ON THE WEST; ARROW MOLDED PLASTICS, INC. ON THE NORTH AND EAST; LOT 7 OF HICKORY END ESTATES ON THE SOUTH, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN EXISTING CONCRETE MONUMENT ON THE EAST SIDE OF EDDY LANE (15.87' FROM THE CENTER), THE NORTHWEST CORNER OF LOT 7 OF HICKORY END ESTATES THENCE LEAVING LOT 7 AND WITH THE EAST SIDE OF EDDY LANE N09°57'36"E 217.96' TO AN EXISTING CONCRETE MONUMENT, THE SOUTH WEST CORNER OF ARROW MOLDED PLASTICS, INC. (REF. DEED BOOK 1145 PAGE 757 R.O.W.C.); THENCE LEAVING EDDY LANE AND WITH THE SOUTH AND WEST LINES OF SAID ARROW PLASTICS S80°14'02"E 225.24' TO AN EXISTING IRON PIN; THENCE S10°13'17"W 196.34' TO AN EXISTING IRON PIN; THENCE N80°12'51"W 40.09' TO AN EXISTING IRON PIN; THENCE S09°50'23"W 22.01' TO AN EXISTING IRON PIN IN THE NORTH LINE OF THE AFOREMENTIONED LOT 7 OF HICKORY END ESTATES; THENCE WITH THE NORTH LINE OF LOT 7, N80°07'00"W 184.30' TO THE POINT OF BEGINNING, CONTAINING 1.10 ACRES, MORE OR LESS, AND BEING THE WALTER LEE SMITHSON AND OVELLA S. SMITHSON LIVING TRUST PROPERTY AS RECORDED IN DEED BOOK 1300 PAGE 544 REGISTER'S OFFICE, ACCORDING TO A SURVEY BY RANDOLPH L. CHAPDELAINE R.L.S.#1444, 7376 WALKER ROAD, FRANKLIN, TENNESSEE 37062 AND DATED MAY 15, 2008.

THE ABOVE TRACT IS SUBJECT TO ALL EASEMENTS, RESTRICTIONS, COVENANTS OF RECORD AND TO THE FINDINGS OF A TITLE REPORT.

SITE DATA:

PROJECT NAME:	COTTAGES AT EDDY LANE
PROJECT NUMBER:	6083
SUBDIVISION:	NA
LOT NUMBER:	NA
ADDRESS:	405 EDDY LANE,
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 78, PARCEL 71.00
EXISTING ZONING:	LIGHT INDUSTRIAL
PROPOSED ZONING:	SD-R(3.64)
CHARACTER AREA OVERLAY:	CFCO-4
OTHER APPLICABLE OVERLAYS	NONE
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
TOTAL ACREAGE:	1.1 AC
TOTAL SQUARE FOOTAGE:	48,156 SF
MINIMUM REQUIRED SETBACKS:	
FRONT YARD:	35'
REAR YARD:	30'
SIDE YARD:	MIN 7.5'
	12' BETWEEN STRUCTURES
OWNER / APPLICANT:	AVENUE 11 DEVELOPMENT
ADDRESS:	1577 WOODMONT BLVD. NASHVILLE, TN 37215
OWNER:	(615) 972-9568
EMAIL:	kurt@ave11dev.com
CONTACT:	KURT DENNY
ENGINEER:	KIMLEY-HORN
ADDRESS:	214 OCEANSIDE DRIVE, NASHVILLE, TN 37204
PHONE:	(615) 564-2701
EMAIL:	ryan.mcmaster@kimley-horn.com
CONTACT:	RYAN MCMASTER
LANDSCAPE ARCHITECT :	GAMBLE DESIGN COLLABORATIVE
ADDRESS:	144 S.E. PARKWAY, SUITE 200, FRANKLIN, TN 37064
PHONE:	(615) 975-5765
FAX:	(615) 790-1350
EMAIL:	greggamble@gdc-tn.com
CONTACT:	GREG GAMBLE

500' OFFSET NEIGHBORS LIST

PRCLID	Property Address	Owner	ZONE	CHARACTER AREA	LAND USE	DEV STANDARD
078---05200	EDDY LN	CITY OF FRANKLIN	LIGHT INDUSTRIAL	CFCO-6	INDUSTRIAL	EITHER
078---05300	312 EDDY LN	MENEFEE VALERIE POTTER	LIGHT INDUSTRIAL	CFCO-4	INDUSTRIAL	CONVENTIONAL
078---05400	314 EDDY LN	WOODY BENNY J	LIGHT INDUSTRIAL	CFCO-6	RESIDENTIAL	EITHER
078---05500	EDDY LN	WOODY BENNY J	LIGHT INDUSTRIAL	CFCO-6	VACANT	EITHER
078---05501	400 EDDY LN	WOODY BENNY J	LIGHT INDUSTRIAL	CFCO-6	INDUSTRIAL	EITHER
078---06707	406 EDDY LN	DODD DANNY R	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078---07100	405 EDDY LN	AVENUE 11 DEV LLC	LIGHT INDUSTRIAL	CFCO-6	RESIDENTIAL	EITHER
078---07200	309 EDDY LN 1	COMPASS DATACENTERS BNA IA LLC	LIGHT INDUSTRIAL	CFCO-6	INDUSTRIAL	EITHER
078---07300	EDDY LN	MIDDLE TENNESSEE ELECTRIC	LIGHT INDUSTRIAL	CFCO-6	UTILITIES	EITHER
078---07302	EDDY LN	TENNESSEE VALLEY AUTHORITY	LIGHT INDUSTRIAL	CFCO-6	UTILITIES	EITHER
078D-C00400	1224 HICKORY RIDGE DR	KUCK FREDERIC D	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-C00500	1228 HICKORY RIDGE DR	WILLIAMS ANTHONY BOYD	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-C00600	1232 HICKORY RIDGE DR	KIRKSEY RONALD D	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-C00700	407 EDDY LN	JONES WILLIAM J	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00100	604 GLENCOE CT	MILLER-HARPER PHYLLIS	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00200	608 GLENCOE CT	STARK CAROL K	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00300	612 GLENCOE CT	LOWERY GRADY	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00400	618 GLENCOE CT	STARK CAROL K TRUSTEE	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00500	620 GLENCOE CT	SAUSEDO KEITH A	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00600	624 GLENCOE CT	YOUNG SANDRA E	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00800	632 GLENCOE CT	HAMLIN KURT W	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-E00100	409 EDDY LN	FISHER CLEM A	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-E00200	411 EDDY LN	KOLE GERALD	R-2	CFCO-4	VACANT	CONVENTIONAL
078E-E00300	413 EDDY LN	KOLE GERALD	R-2	CFCO-4	VACANT	CONVENTIONAL
078D-F00100	417 EDDY LN APT A	THOMPSON MILDRED PAUNEE	SD-R	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-F00200	415 EDDY LN APT A	THOMPSON MILDRED PAUNEE	SD-R	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-F00300	106 LUCINDA CT	WARREN CELINDA C	SD-R	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-G00100	408 EDDY LN	HAMLING KATHLEEN K	R-2	CFCO-4	VACANT	CONVENTIONAL
078D-G00200	412 EDDY LN	CHILDRESS JASON	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-G00300	416 EDDY LN	CHILDRESS JASON	R-2	CFCO-4	VACANT	CONVENTIONAL
078E-I00100	112 LUCINDA CT	COURSEY MARK LYNN	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-I00200	116 LUCINDA CT	DODGE KENNETH B	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-I00300	120 LUCINDA CT	BLACKNEY SHAWN M	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-I00400	124 LUCINDA CT	HOOD MIKCKEY D	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-I00500	128 LUCINDA CT	GUNDERSON HEATHER	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-I00600	136 LUCINDA CT	DESOUZA KENNETH R	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL

OVERALL EXISTING CONDITIONS PLAN

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

Kimley»Horn
214 Oceanside Drive Nashville, TN 37204
Main: 615.564.2701 | www.kimley-horn.com

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COTTAGES AT EDDY LANE

REZONING REQUEST

FRANKLIN, TENNESSEE

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT
STATE OF TENNESSEE
No. 328
LANDSCAPE ARCHITECT

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
SUITE 230
FRANKLIN, TENNESSEE 37064
GREG GAMBLE
greggamble209@gmail.com
615.975.5765

rev.	date
1.	4.7.2016

GDC Job No. 15024
MARCH 14, 2016

SHEET

C1.0

COF # 6083

GRAPHIC SCALE 1"=20'

0 10 20 40 60

THE INFORMATION SHOWN ON THIS PLAN IS BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIP ZONE 4100 AND NAD 83 DATUM.

STATEMENT OF IMPACTS

STREET NETWORK
EDDY LANE IS CATEGORIZED AS A MAJOR COLLECTOR WITH AN EXISTING 30' ROW SECTION AND A PROPOSED 65' ROW SECTION, 21.5' OF ROW FROM THE EXISTING ROW LINE ON THE EAST SIDE OF THE STREET WILL BE REQUIRED FOR DEDICATION. BASED ON THE CITY OF FRANKLIN MAJOR THOROUGHFARE PLAN, THIS PROPOSED DEVELOPMENT WILL NOT ADVERSELY AFFECT PLANS ASSOCIATED WITH PROJECT #21. AVERAGE DAILY TRIPS WILL INCREASE FROM 31 UNDER EXISTING CONDITIONS TO 38 UNDER PROPOSED CONDITIONS.

WATER
WATER WILL BE PROVIDED BY CITY OF FRANKLIN VIA AN EXISTING 6" PIPE RUNNING WITHIN THE PAVEMENT OF EDDY LANE. THERE ARE THREE EXISTING RESIDENTIAL SERVICES THAT WILL CONTINUE TO SERVE THE SITE. ONE ADDITIONAL RESIDENTIAL WATER SERVICE IS PROPOSED. AS THE SITE IS PROPOSED TO GO FROM 2 SINGLE FAMILY AND 1 DUPLEX(4 TOTAL SFUE) TO 4 SINGLE FAMILY HOMES (4SFUE), WATER USE IN GPD IS NOT EXPECTED TO INCREASE ON THIS SITE.

SEWER
SEWER WILL BE PROVIDED BY CITY OF FRANKLIN VIA AN EXISTING 8" PIPE RUNNING WITHIN THE PAVEMENT OF EDDY LANE. THERE ARE THREE EXISTING RESIDENTIAL SERVICES THAT WILL CONTINUE TO SERVE THE SITE. ONE ADDITIONAL RESIDENTIAL SANITARY SEWER SERVICE IS PROPOSED.

RECLAIMED WATER
RECLAIMED WATER IS NOT KNOWN TO BE PRESENT AT THIS SITE, EXTENSIONS ARE NOT PROPOSED.

DRAINAGE FACILITIES
POST DEVELOPMENT PEAK FLOWS WILL BE LESS THAN PRE DEVELOPMENT PEAK FLOWS AND THE OUTFALL LOCATION WILL NOT CHANGE. THE DEVELOPMENT WILL INCREASE IMPERVIOUS AREA FROM 0.26 AC TO 0.41 AC. ALL WATER ON THE SITE WILL BE CONVEYED TO LOW IMPACT DEVELOPMENT STORMWATER TREATMENT AREAS AND THEN ROUTED TO THE PROPOSED DETENTION POND, AND THEN TO THE EXISTING PIPE AT THE SOUTHEAST CORNER OF THE SITE.

POLICE/FIRE
0.92 MILES FROM THE POLICE DEPARTMENT AND 1.3 MILES FROM THE FIRE DEPARTMENT. AS ALL HOMES SHARE FRONTAGE ALONG EDDY LANE, ACCESSIBILITY OF EMERGENCY VEHICLES WILL NOT BE AN ISSUE.

RECREATION/SCHOOLS
WHILE NUMBER OF STRUCTURES WILL INCREASE BY ONE, THIS DEVELOPMENT WILL NOT ADD ANY ADDITIONAL RESIDENTIAL UNITS AND WILL THEREFORE HAVE NO ADVERSE EFFECT ON SURROUNDING SCHOOLS AND RECREATIONAL FACILITIES.

REFUSE COLLECTION
REFUSE COLLECTION SERVICE WILL BE PROVIDED BY THE CITY OF FRANKLIN SOLID WASTE.

RESTRICTIVE COVENANTS
NO HOA WILL BE ESTABLISHED FOR THIS SUBDIVISION

MINERAL RIGHTS
NO THIRD PARTY MINERAL RIGHTS ARE ASSOCIATED WITH THIS PROPERTY.

LAND USE PLAN COMPLIANCE
CHARACTER AREA OVERLAY: CFCO-6
APPLICABLE DEVELOPMENT STANDARD: CONVENTIONAL

LOCAL COMPATIBILITY
THE COTTAGES AT EDDY LANE HAVE COMPARABLE LOT ACREAGE AND FRONT YARD SETBACKS TO THE EXISTING RESIDENCES TO THE SOUTH ON EDDY LANE. THE PROPOSED LOTS WILL CONTINUE THE ESTABLISHED RHYTHM AND CHARACTER OF THE NEIGHBORING HOMES AS WELL.

SIDEWALK
SIDEWALKS TO BE INSTALLED.

STORMWATER MANAGEMENT NARRATIVE
ON-SITE STORMWATER WILL BE DIRECTED AWAY FROM PROPOSED BUILDINGS VIA POSITIVE DRAINAGE AND SWALES. OVERALL DRAINAGE PATTERNS WILL MIMIC EXISTING CONDITIONS, FLOWING FROM NORTH TO SOUTH AND WEST TO EAST. STORMWATER WILL THEN BE DIRECTED TO PROPOSED BIORETENTION AREAS. OFF-SITE STORMWATER WILL BE DIVERTED AWAY FROM ANY PROPOSED STORMWATER TREATMENT AREAS. THE PROPOSED BIORETENTION AREAS WILL TREAT STORMWATER RUNOFF BEFORE IT EITHER INFILTRATES INTO THE SOIL OR DISCHARGES T THE PROPOSED DETENTION BASIN.

EACH INDIVIDUAL OWNER SHALL BE RESPONSIBLE FOR AND SHALL MAINTAIN THE STORMWATER INFRASTRUCTURE LOCATED ON THE INDIVIDUAL LOT. THESE ITEMS INCLUDE RAIN GARDENS, DETENTION BASINS, AND DRAINAGE SWALES.

SITE DATA:

PROJECT NAME:	COTTAGES AT EDDY LANE
PROJECT NUMBER:	6083
SUBDIVISION:	NA
LOT NUMBER:	NA
ADDRESS:	405 EDDY LANE,
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 78, PARCEL 71.00
EXISTING ZONING:	LIGHT INDUSTRIAL
PROPOSED ZONING:	SD-R(3.64)
CHARACTER AREA OVERLAY:	CFCO-4
OTHER APPLICABLE OVERLAYS	NONE
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
TOTAL ACREAGE:	1.1 AC
TOTAL SQUARE FOOTAGE:	48,156 SF
MINIMUM REQUIRED SETBACKS:	
FRONT YARD:	35'
REAR YARD:	30'
SIDE YARD:	MIN 7.5'
	12' BETWEEN STRUCTURES
OWNER / APPLICANT:	AVENUE 11 DEVELOPMENT
ADDRESS:	1577 WOODMONT BLVD. NASHVILLE, TN 37215
OWNER:	(615) 972-9568
EMAIL:	kurt@ave11dev.com
CONTACT:	KURT DENNY
ENGINEER:	KIMLEY-HORN
ADDRESS:	214 OCEANSIDE DRIVE, NASHVILLE, TN 37204
PHONE:	(615) 564-2701
EMAIL:	ryan.mcmaster@kimley-horn.com
CONTACT:	RYAN MCMASTER
LANDSCAPE ARCHITECT :	GAMBLE DESIGN COLLABORATIVE
ADDRESS:	144 S.E. PARKWAY, SUITE 200, FRANKLIN, TN 37064
PHONE:	(615) 975-5765
FAX:	(615) 790-1350
EMAIL:	greg.gamble@gdc-tn.com
CONTACT:	GREG GAMBLE

EXISTING TREE CANOPY

BASED ON AERIAL PHOTOGRAPHS OF THE PROPERTY THE EXISTING TREE CANOPY IS APPROXIMATELY 8.098 SF WHICH IS 16.8% OF THE TOTAL SITE

TREE CANOPY DATA

TREE AREA	EXISTING
TREE A	16,656 SF
TREE B	2,855 SF
TOTAL SF	19,511 SF

EXISTING TREE CANOPY: 19,511 SF
19,511 SF/48,156 SF = .405 (40.5%) OF TOTAL SITE

REQUIRED CANOPY PRESERVATION =
45% OF TOTAL CANOPY
19,511 SF * 45% = 8,780 SF

SPECIMEN TREE LIST

Number	Type	Size	Health	Status
1	HACKBERRY	26"	GOOD	REMAINS

EXISTING SOILS

STB2—STIVERSVILLE SILT LOAM, 2 TO 5 PERCENT SLOPES, ERODED
STC2—STIVERSVILLE SILT LOAM, 5 TO 12 PERCENT SLOPES, ERODED

GENERAL NOTES

1. THERE ARE NO SLOPES GREATER THAN 14% ON THE SITE
2. THERE ARE NO THIRD PARTY MINERAL RIGHTS ARE ASSOCIATED WITH THIS PROPERTY.
3. THERE IS NO FLOOD PLAIN ON THE SITE.

ENLARGED EXISTING CONDITIONS

GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

Kimley»Horn
214 Oceanside Drive, Nashville, TN 37204
Main: 615.564.2701 | www.kimley-horn.com
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COTTAGES AT EDDY LANE

REZONING REQUEST

FRANKLIN, TENNESSEE

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT
STATE OF TENNESSEE
LANDSCAPE ARCHITECT

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
SUITE 230
FRANKLIN, TENNESSEE 37064
GREG GAMBLE
greggamble209@gmail.com
615.975.5765

rev.	date
1.	4.7.2016

GDC Job No. 15024
MARCH 14, 2016

SHEET
C1.1

COF # 6083

RESOLUTION 2016-19

TO BE ENTITLED: "A RESOLUTION APPROVING A DEVELOPMENT PLAN FOR COTTAGES AT EDDY LANE PUD SUBDIVISION, FOR THE PROPERTY LOCATED AT 405 EDDY LANE."

WHEREAS, the Board of Mayor and Alderman (BOMA) of the City of Franklin, Tennessee, has, or will, approve the zoning for the property as part of Ordinance 2016-007; and

WHEREAS, the Planned Unit Development (PUD) process is a review procedure that is intended to encourage innovative land planning and design and avoid the monotony sometimes associated with large developments by:

(a) Reducing or eliminating the inflexibility that sometimes results from strict application of zoning standards that were designed primarily for individual lots;

(b) Allowing greater freedom in selecting the means to provide access, light, open space, and design amenities;

(c) Encouraging a sensitive design that respects the surrounding established land use character and natural or man-made features of the site including, but not limited to, trees, historic features, streams, hillsides, and floodplains;

(d) Promoting quality design and environmentally sensitive development by allowing development to take advantage of special site characteristics, locations, and land uses; and

(e) Allowing deviations from certain zoning standards that would otherwise apply if not contrary to the general spirit and intent of this ordinance; and

WHEREAS, the PUD process requires the approval of a Development Plan that is reviewed and approved by BOMA, after a public hearing and a recommendation by the Franklin Municipal Planning Commission.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF MAYOR AND ALDERMAN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That the legal description of the property included in the Development Plan is as follows:

PREMISES CONSIDERED

Map-Parcel	Acres
78-71.00	1.1
Total	1.1

Legal Description provided:

BEING A TRACT OF LAND AS SHOWN ON PROPERTY MAP 78, ASSESSOR'S OFFICE AND LYING WHOLLY WITHIN THE 9th CIVIL DISTRICT OF WILLIAMSON COUNTY, FRANKLIN, TENNESSEE. BOUNDED IN GENERAL BY EDDY LANE ON THE WEST; ARROW MOLDED PLASTICS, INC. ON THE NORTH AND EAST; LOT 7 OF HICKORY END ESTATES ON THE SOUTH, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

Law Dept. approved 04.14.16

BEGINNING AT AN EXISTING CONCRETE MONUMENT ON THE EAST SIDE OF EDDY LANE (15.87' FROM THE CENTER), THE NORTHWEST CORNER OF LOT 7 OF HICKORY END ESTATES THENCE LEAVING LOT 7 AND WITH THE EAST SIDE OF EDDY LANE N09°57'36"E 217.96' TO AN EXISTING CONCRETE MONUMENT, THE SOUTH WEST CORNER OF ARROW MOLDED PLASTICS, INC. (REF. DEED BOOK 1145 PAGE 757 R.O.W.C.); THENCE LEAVING EDDY LANE AND WITH THE SOUTH AND WEST LINES OF SAID ARROW PLASTICS S80°14'02"E 225.24' TO AN EXISTING IRON PIN; THENCE S10°13'17"W 196.34' TO AN EXISTING IRON PIN; THENCE N80°12'51"W 40.09' TO AN EXISTING IRON PIN; THENCE S09°50'23"W 22.01' TO AN EXISTING IRON PIN IN THE NORTH LINE OF THE AFOREMENTIONED LOT 7 OF HICKORY END ESTATES; THENCE WITH THE NORTH LINE OF LOT 7, N80°07'00"W 184.30' TO THE POINT OF BEGINNING, CONTAINING 1.10 ACRES, MORE OR LESS, AND BEING THE WALTER LEE SMITHSON AND OVELLA S. SMITHSON LIVING TRUST PROPERTY AS RECORDED IN DEED BOOK 1300 PAGE 544 REGISTER'S OFFICE, ACCORDING TO A SURVEY BY RANDOLPH L. CHAPDELAINE R.L.S.#1444, 7376 WALKER ROAD, FRANKLIN, TENNESSEE 37062 AND DATED MAY 15, 2008.

SECTION II: That the attached Location Map and Development Plan shall serve the purpose of further delimiting the geographical boundaries as described by this Resolution.

SECTION III: That the overall entitlements for the Cottages at Eddy Lane PUD Subdivision are as follows:

Entitlements	Cottages at Eddy Lane
Base Zone District	SD-R (3.64)
Character Area Overlay	CFCO-4
Other Zoning Overlays	None
Development Standard	Traditional
Number of Dwelling Units	4
Number of Nonresidential Square Footage	0
Number of Hotel Rooms	0
Connectivity Index	n/a
Open Space Requirements	n/a
Number of Phases in Development	1

SECTION IV: That the Development Plan, the exhibits accompanying the Development Plan, and all conditions and restrictions placed upon the Development Plan by the Franklin Municipal Planning Commission and this Board shall be made a part of this Resolution as though copied verbatim herein, and

that a permanent record of the Development Plan, the exhibits accompanying the Development Plan, and all such conditions and restrictions shall be kept in the Franklin Planning and Sustainability Department.

SECTION V: That this Resolution shall take effect from and after its passage on its first and final reading, the health, safety, and welfare of the citizens requiring it.

_____ _____

ERIC S. STUCKEY
City Administrator

DR. KEN MOORE
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

PREAPPLICATION CONFERENCE: 2/23/16

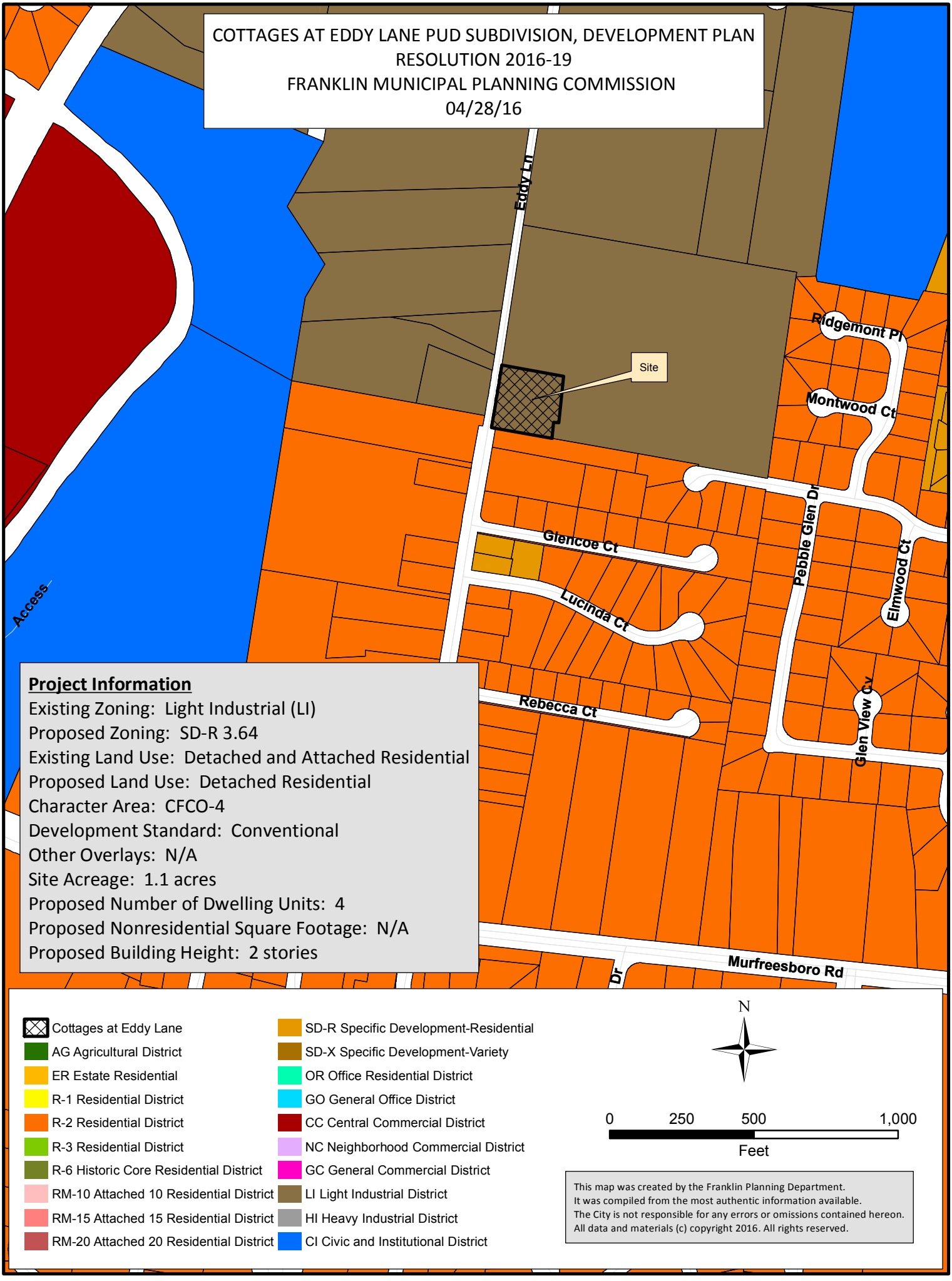
BOMA/FMPC JOINT CONCEPTUAL WORKSHOP: 2/25/16

NEIGHBORHOOD MEETING: 3/9/16

PLANNING COMMISSION RECOMMENDED APPROVAL: 4/28/16

PUBLIC HEARING AND BOMA APPROVAL: _____

Law Dept. approved 04.14.16


COTTAGES AT EDDY LANE PUD SUBDIVISION, DEVELOPMENT PLAN
RESOLUTION 2016-19
FRANKLIN MUNICIPAL PLANNING COMMISSION
04/28/16
Eddy Ln
Site
Ridgemont Pl
Montwood Ct
Pebble Glen Dr
Glencoe Ct
Lucinda Ct
Elmwood Ct
Glen View Cv
Rebecca Ct
Murfreesboro Rd
Access
Project Information
Existing Zoning: Light Industrial (LI)
Proposed Zoning: SD-R 3.64
Existing Land Use: Detached and Attached Residential
Proposed Land Use: Detached Residential
Character Area: CFCO-4
Development Standard: Conventional
Other Overlays: N/A
Site Acreage: 1.1 acres
Proposed Number of Dwelling Units: 4
Proposed Nonresidential Square Footage: N/A
Proposed Building Height: 2 stories
Cottages at Eddy Lane
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
250
500
1,000
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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COF no: 6084

CONDITIONS OF APPROVAL:

Engineering - PUD Plan Checklist

General Comments

1. H. Stormwater Management Plan

- There are two options for detention and water quality features in residential developments:

1) If there are any shared features which serve multiple lots not under common ownership, these must be located in an Open Space Lot to be maintained by an HOA. (This is the City's preferred option).

2) If there will not be an HOA and the lots will not be under common ownership, detention and water quality must be handled on a lot-by-lot basis (for example, by individual raingardens on each lot, each within a Green Infrastructure Easement), not through the use of shared stormwater features.

The proposed use of "open space areas" within lots to semantically address the requirements of the Stormwater Ordinance and requiring individual homeowners to maintain shared stormwater features is not an acceptable approach.

2. B. General Information

-

The previous comment "Provide the length, width and location of the guest parking stalls." was not completely addressed. Provide the width of the parking stalls. Indicate which side of the drive the parking stalls are to be located.

Planning (Landscape)

General Comments

3. Informal open space

- Zoning ordinance 5.5.2(2) refers to "formal" open space. Per COF Zoning 5.5.3 private open space, 15% of the gross development shall be informal open space. Applicant meets the open space requirement with the existing tree lines. Applicant shall provide the open space calculations on the plans.

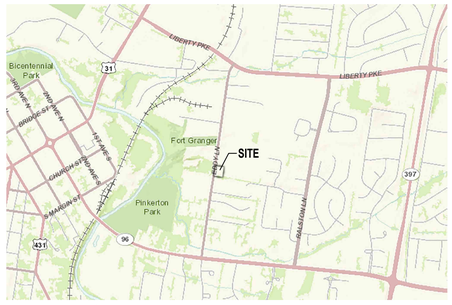
COTTAGES AT EDDY LANE

PUD SUBDIVISION, DEVELOPMENT PLAN

COF # 6084
MAP 78, PARCEL 71.00
FRANKLIN, TENNESSEE
CIVIL DISTRICT 9

SHEET INDEX

C 0.0 COVER SHEET
C 1.0 OVERALL EXISTING CONDITIONS PLAN
C 1.1 ENLARGED EXISTING CONDITIONS PLAN
C 2.0 OVERALL DEVELOPMENT PLAN
C 2.1 TREE PRESERVATION PLAN
C 3.0 GRADING, DRAINAGE, AND UTILITY PLAN
C 4.0 TYPICAL ARCHITECTURE



VACINITY MAP
1" = 1,500' APPROX

LANDSCAPE ARCHITECT/PLANNER
GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY SUITE 200
FRANKLIN TN 37064
GREG GAMBLE, RLA (615) 975-5765
EMAIL ADDRESS: greggamble209@gmail.com

GDC GAMBLE DESIGN COLLABORATIVE

COTTAGES AT EDDY LANE
PUD SUBDIVISION, DEVELOPMENT PLAN
COF # 6084
FRANKLIN, TENNESSEE

SITE DATA:

PROJECT NAME:	COTTAGES AT EDDY LANE
PROJECT NUMBER:	6084
SUBDIVISION:	NA
LOT NUMBER:	NA
ADDRESS:	405 EDDY LANE,
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 78, PARCEL 71.00
EXISTING ZONING:	LIGHT INDUSTRIAL
PROPOSED ZONING:	SD-R(3.64)
CHARACTER AREA OVERLAY:	CFCO-4
OTHER APPLICABLE OVERLAYS	NONE
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
TOTAL ACREAGE:	1.1 AC
TOTAL SQUARE FOOTAGE:	48,156 SF
MINIMUM REQUIRED SETBACKS:	
FRONT YARD:	35'
REAR YARD:	30'
SIDE YARD:	MIN 7.5' 12' BETWEEN STRUCTURES
OWNER / APPLICANT:	AVENUE 11 DEVELOPMENT
ADDRESS:	1577 WOODMONT BLVD. NASHVILLE, TN 37215
OWNER:	(615) 972-9568
EMAIL:	kurt@ave11dev.com
CONTACT:	KURT DENNY
ENGINEER:	KIMLEY-HORN
ADDRESS:	214 OCEANSIDE DRIVE, NASHVILLE, TN 37204
PHONE:	(615) 564-2701
EMAIL:	ryan.mcmaster@kimley-horn.com
CONTACT:	RYAN MCMASTER
LANDSCAPE ARCHITECT :	GAMBLE DESIGN COLLABORATIVE
ADDRESS:	144 S.E. PARKWAY, SUITE 200, FRANKLIN, TN 37064
PHONE:	(615) 975-5765
FAX:	(615) 790-1350
EMAIL:	greg.gamble@gdc-tn.com
CONTACT:	GREG GAMBLE

PRE-APPLICATION SUBMITTAL	FEBRUARY 9, 2016
INITIAL SUBMITTAL	MARCH 14, 2016
RESUBMITTAL	APRIL 7, 2016
REVISION	-
REVISION	-

GRAPHIC SCALE 1"=40'

0 20 40 80 160

THE INFORMATION SHOWN ON THIS PLAN IS BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIP ZONE 4100 AND NAD 83 DATUM.

LEGAL DESCRIPTION

BEING A TRACT OF LAND AS SHOWN ON PROPERTY MAP 78, ASSESSOR'S OFFICE AND LYING WHOLLY WITHIN THE 9th CIVIL DISTRICT OF WILLIAMSON COUNTY, FRANKLIN, TENNESSEE. BOUNDED IN GENERAL BY EDDY LANE ON THE WEST; ARROW MOLDED PLASTICS, INC. ON THE NORTH AND EAST; LOT 7 OF HICKORY END ESTATES ON THE SOUTH, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN EXISTING CONCRETE MONUMENT ON THE EAST SIDE OF EDDY LANE (15.87' FROM THE CENTER), THE NORTHWEST CORNER OF LOT 7 OF HICKORY END ESTATES THENCE LEAVING LOT 7 AND WITH THE EAST SIDE OF EDDY LANE N09°57'36"E 217.96' TO AN EXISTING CONCRETE MONUMENT, THE SOUTH WEST CORNER OF ARROW MOLDED PLASTICS, INC. (REF. DEED BOOK 1145 PAGE 757 R.O.W.C.); THENCE LEAVING EDDY LANE AND WITH THE SOUTH AND WEST LINES OF SAID ARROW PLASTICS S80°14'02"E 225.24' TO AN EXISTING IRON PIN; THENCE S10°13'17"W 196.34' TO AN EXISTING IRON PIN; THENCE N80°12'51"W 40.09' TO AN EXISTING IRON PIN; THENCE S09°50'23"W 22.01' TO AN EXISTING IRON PIN IN THE NORTH LINE OF THE AFOREMENTIONED LOT 7 OF HICKORY END ESTATES; THENCE WITH THE NORTH LINE OF LOT 7, N80°07'00"W 184.30' TO THE POINT OF BEGINNING, CONTAINING 1.10 ACRES, MORE OR LESS, AND BEING THE WALTER LEE SMITHSON AND OVELLA S. SMITHSON LIVING TRUST PROPERTY AS RECORDED IN DEED BOOK 1300 PAGE 544 REGISTER'S OFFICE, ACCORDING TO A SURVEY BY RANDOLPH L. CHAPDELAINE R.L.S.#1444, 7376 WALKER ROAD, FRANKLIN, TENNESSEE 37062 AND DATED MAY 15, 2008.

THE ABOVE TRACT IS SUBJECT TO ALL EASEMENTS, RESTRICTIONS, COVENANTS OF RECORD AND TO THE FINDINGS OF A TITLE REPORT.

SITE DATA:

PROJECT NAME:	COTTAGES AT EDDY LANE
PROJECT NUMBER:	6084
SUBDIVISION:	NA
LOT NUMBER:	NA
ADDRESS:	405 EDDY LANE,
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 78, PARCEL 71.00
EXISTING ZONING:	LIGHT INDUSTRIAL
PROPOSED ZONING:	SD-R(3.64)
CHARACTER AREA OVERLAY:	CFCO-4
OTHER APPLICABLE OVERLAYS	NONE
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
TOTAL ACREAGE:	1.1 AC
TOTAL SQUARE FOOTAGE:	48,156 SF
MINIMUM REQUIRED SETBACKS:	
FRONT YARD:	35'
REAR YARD:	30'
SIDE YARD:	MIN 7.5'
	12' BETWEEN STRUCTURES
OWNER / APPLICANT:	AVENUE 11 DEVELOPMENT
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FAX:	(615) 790-1350
EMAIL:	greg.gamble@gdc-tn.com
CONTACT:	GREG GAMBLE

500' OFFSET NEIGHBORS LIST

PRCLID	Property Address	Owner	ZONE	CHARACTER AREA	LAND USE	DEV STANDARD
078---05200	EDDY LN	CITY OF FRANKLIN	LIGHT INDUSTRIAL	CFCO-6	INDUSTRIAL	EITHER
078---05300	312 EDDY LN	MENEFEE VALERIE POTTER	LIGHT INDUSTRIAL	CFCO-4	INDUSTRIAL	CONVENTIONAL
078---05400	314 EDDY LN	WOODY BENNY J	LIGHT INDUSTRIAL	CFCO-6	RESIDENTIAL	EITHER
078---05500	EDDY LN	WOODY BENNY J	LIGHT INDUSTRIAL	CFCO-6	VACANT	EITHER
078---05501	400 EDDY LN	WOODY BENNY J	LIGHT INDUSTRIAL	CFCO-6	INDUSTRIAL	EITHER
078---06707	406 EDDY LN	DODD DANNY R	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078---07100	405 EDDY LN	AVENUE 11 DEV LLC	LIGHT INDUSTRIAL	CFCO-6	RESIDENTIAL	EITHER
078---07200	309 EDDY LN 1	COMPASS DATACENTERS BNA IA LLC	LIGHT INDUSTRIAL	CFCO-6	INDUSTRIAL	EITHER
078---07300	EDDY LN	MIDDLE TENNESSEE ELECTRIC	LIGHT INDUSTRIAL	CFCO-6	UTILITIES	EITHER
078---07302	EDDY LN	TENNESSEE VALLEY AUTHORITY	LIGHT INDUSTRIAL	CFCO-6	UTILITIES	EITHER
078D-C00400	1224 HICKORY RIDGE DR	KUCK FREDERIC D	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-C00500	1228 HICKORY RIDGE DR	WILLIAMS ANTHONY BOYD	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-C00600	1232 HICKORY RIDGE DR	KIRKSEY RONALD D	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-C00700	407 EDDY LN	JONES WILLIAM J	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00100	604 GLENCOE CT	MILLER-HARPER PHYLLIS	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00200	608 GLENCOE CT	STARK CAROL K	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00300	612 GLENCOE CT	LOWERY GRADY	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00400	618 GLENCOE CT	STARK CAROL K TRUSTEE	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00500	620 GLENCOE CT	SAUSEDO KEITH A	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00600	624 GLENCOE CT	YOUNG SANDRA E	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-D00800	632 GLENCOE CT	HAMLIN KURT W	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-E00100	409 EDDY LN	FISHER CLEM A	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-E00200	411 EDDY LN	KOLE GERALD	R-2	CFCO-4	VACANT	CONVENTIONAL
078D-E00300	413 EDDY LN	KOLE GERALD	R-2	CFCO-4	VACANT	CONVENTIONAL
078D-F00100	417 EDDY LN APT A	THOMPSON MILDRED PAUNEE	SD-R	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-F00200	415 EDDY LN APT A	THOMPSON MILDRED PAUNEE	SD-R	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-F00300	106 LUCINDA CT	WARREN CELINDA C	SD-R	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-G00100	408 EDDY LN	HAMLING KATHLEEN K	R-2	CFCO-4	VACANT	CONVENTIONAL
078D-G00200	412 EDDY LN	CHILDRESS JASON	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078D-G00300	416 EDDY LN	CHILDRESS JASON	R-2	CFCO-4	VACANT	CONVENTIONAL
078E-I00100	112 LUCINDA CT	COURSEY MARK LYNN	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-I00200	116 LUCINDA CT	DODGE KENNETH B	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-I00300	120 LUCINDA CT	BLACKNEY SHAWN M	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-I00400	124 LUCINDA CT	HOOD MIKCKEY D	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-I00500	128 LUCINDA CT	GUNDERSON HEATHER	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL
078E-I00600	136 LUCINDA CT	DESOUZA KENNETH R	R-2	CFCO-4	RESIDENTIAL	CONVENTIONAL

OVERALL EXISTING CONDITIONS PLAN

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

Kimley»Horn
214 Oceanside Drive Nashville, TN 37204
Main: 615.564.2701 | www.kimley-horn.com

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COTTAGES AT EDDY LANE

PUD SUBDIVISION, DEVELOPMENT PLAN

FRANKLIN, TENNESSEE

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
SUITE 230
FRANKLIN, TENNESSEE 37064
GREG GAMBLE
greggamble209@gmail.com
615.975.5765

rev. date

1. 4.7.2016

GDC Job No. 15024
MARCH 14, 2016

SHEET

C1.0

COF # 6084

GRAPHIC SCALE 1"=20'

0 10 20 40 60

THE INFORMATION SHOWN ON THIS PLAN IS BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIP ZONE 4100 AND NAD 83 DATUM.

SITE DATA:

PROJECT NAME:	COTTAGES AT EDDY LANE
PROJECT NUMBER:	6084
SUBDIVISION:	NA
LOT NUMBER:	NA
ADDRESS:	405 EDDY LANE,
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 78, PARCEL 71.00
EXISTING ZONING:	LIGHT INDUSTRIAL
PROPOSED ZONING:	SD-R(3.64)
CHARACTER AREA OVERLAY:	CFCO-4
OTHER APPLICABLE OVERLAYS	NONE
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
TOTAL ACREAGE:	1.1 AC
TOTAL SQUARE FOOTAGE:	48,156 SF
MINIMUM REQUIRED SETBACKS:	
FRONT YARD:	35'
REAR YARD:	30'
SIDE YARD:	MIN 7.5'
	12' BETWEEN STRUCTURES
OWNER / APPLICANT:	AVENUE 11 DEVELOPMENT
ADDRESS:	1577 WOODMONT BLVD. NASHVILLE, TN 37215
OWNER:	(615) 972-9568
EMAIL:	kurt@ave11dev.com
CONTACT:	KURT DENNY
ENGINEER:	KIMLEY-HORN
ADDRESS:	214 OCEANSIDE DRIVE, NASHVILLE, TN 37204
PHONE:	(615) 564-2701
EMAIL:	ryan.mcmaster@kimley-horn.com
CONTACT:	RYAN MCMASTER
LANDSCAPE ARCHITECT :	GAMBLE DESIGN COLLABORATIVE
ADDRESS:	144 S.E. PARKWAY, SUITE 200, FRANKLIN, TN 37064
PHONE:	(615) 975-5765
FAX:	(615) 790-1350
EMAIL:	greg.gamble@gdc-tn.com
CONTACT:	GREG GAMBLE

EXISTING TREE CANOPY

BASED ON AERIAL PHOTOGRAPHS OF THE PROPERTY THE EXISTING TREE CANOPY IS APPROXIMATELY 8,098 SF WHICH IS 16.8% OF THE TOTAL SITE

TREE CANOPY DATA

TREE AREA	EXISTING
TREE A	16,656 SF
TREE B	2,855 SF
TOTAL SF	19,511 SF

EXISTING TREE CANOPY: 19,511 SF
19,511 SF/48,156 SF = .405 (40.5%) OF TOTAL SITE

REQUIRED CANOPY PRESERVATION =
45% OF TOTAL CANOPY
19,511 SF * 45% = 8,780 SF

SPECIMEN TREE LIST

Number	Type	Size	Health	Status
1	HACKBERRY	26"	GOOD	REMAINS

EXISTING SOILS

STB2—STIVERSVILLE SILT LOAM, 2 TO 5 PERCENT SLOPES, ERODED
STC2—STIVERSVILLE SILT LOAM, 5 TO 12 PERCENT SLOPES, ERODED

GENERAL NOTES

1. THERE ARE NO SLOPES GREATER THAN 14% ON THE SITE
2. THERE ARE NO THIRD PARTY MINERAL RIGHTS ARE ASSOCIATED WITH THIS PROPERTY.
3. THERE IS NO FLOOD PLAIN ON THE SITE.

ENLARGED EXISTING CONDITIONS

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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COTTAGES AT EDDY LANE
PUD SUBDIVISION, DEVELOPMENT PLAN
FRANKLIN, TENNESSEE

GREGORY C. CARLISLE
REGISTERED
LANDSCAPE ARCHITECT
No. 329
STATE OF TENNESSEE

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
SUITE 230
FRANKLIN, TENNESSEE 37064
GREG GAMBLE
greggamble2098@gmail.com
615.975.5765

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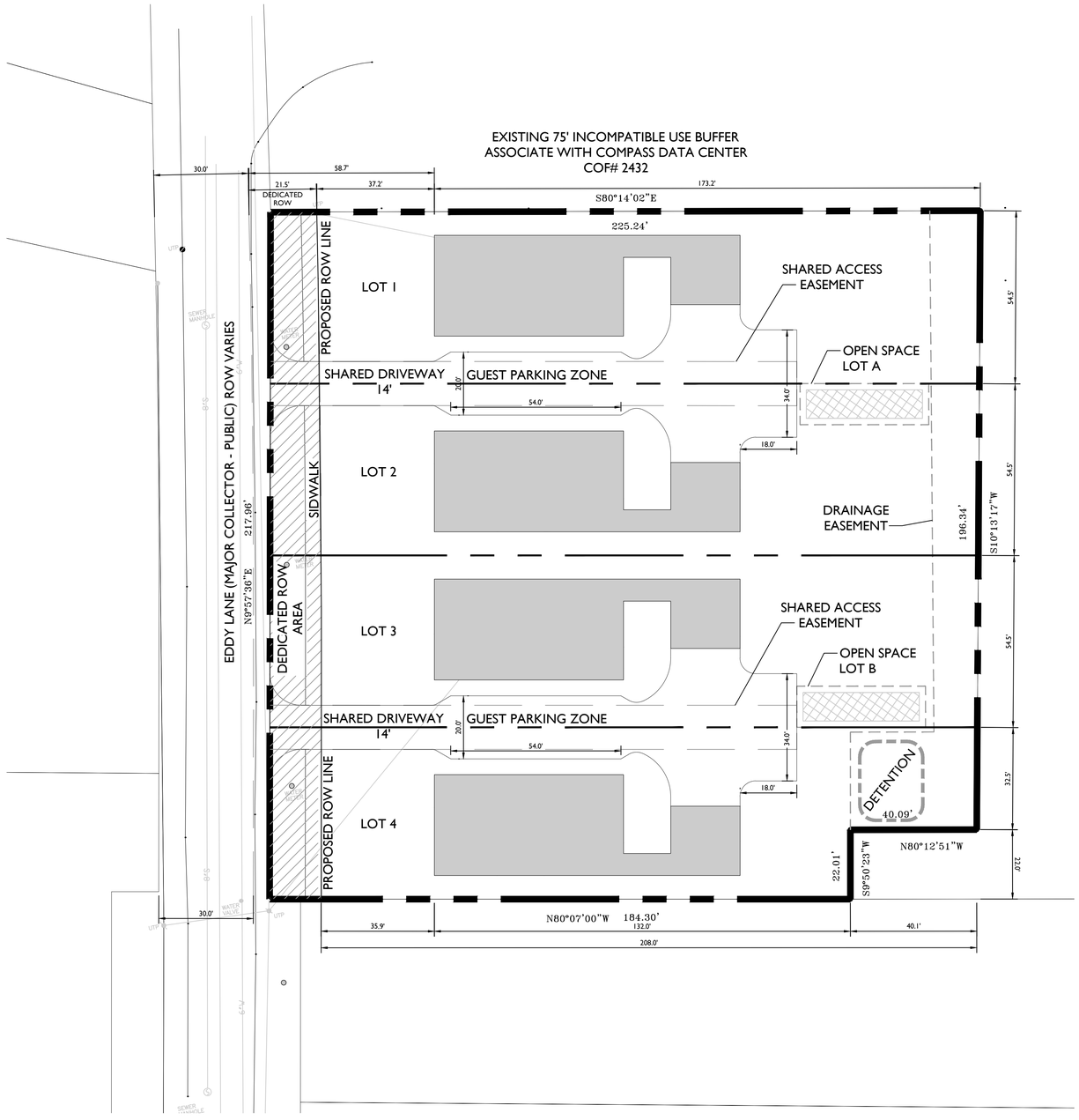

THE INFORMATION SHOWN ON THIS PLAN IS BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIP ZONE 4100 AND NAD 83 DATUM.

LOT AREAS

LOT #	LOT SF	LOT ACREAGE
LOT 1	11,445 SF	0.26 AC
LOT 2	11,391 SF	0.26 AC
LOT 3	11,336 SF	0.26 AC
LOT 4	10,456 SF	0.24 AC
OPEN SPACE LOT A	533 SF	0.01 AC
OPEN SPACE LOT B	533 SF	0.01 AC

SITE DATA:

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LOT NUMBER:	NA
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COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 78, PARCEL 71.00
EXISTING ZONING:	LIGHT INDUSTRIAL
PROPOSED ZONING:	SD-R(3.64)
CHARACTER AREA OVERLAY:	CFCO-4
OTHER APPLICABLE OVERLAYS	NONE
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
TOTAL ACREAGE:	1.1 AC
TOTAL SQUARE FOOTAGE:	48,156 SF
MINIMUM REQUIRED SETBACKS:	
FRONT YARD:	35'
REAR YARD:	30'
SIDE YARD:	MIN 7.5' 12' BETWEEN STRUCTURES
OWNER / APPLICANT:	AVENUE 11 DEVELOPMENT
ADDRESS:	1577 WOODMONT BLVD. NASHVILLE, TN 37215
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PHONE:	(615) 975-5765
FAX:	(615) 790-1350
EMAIL:	greg.gamble@gdc-tn.com
CONTACT:	GREG GAMBLE
BUILDING SQUARE FOOTAGE:	2,800 - 3,200 SF
BUILDING HEIGHT:	3 STORY MAX
LANDSCAPE SURFACE RATIO:	.40
MINIMUM LANDSCAPE RATIO:	.20
INCOMPATIBLE-USE BUFFER REQUIRED:	NOT REQUIRED
MINIMUM PARKING REQUIRED:	2 PER HOME
EXISTING PARKING:	N/A
PARKING PROVIDED:	3 PER HOME
RESIDENTIAL DENSITY:	3.64 DUA (4 SINGLE FAMILY DETACHED HOMES)
EXISTING TREE CANOPY:	0.19 AC
PRESERVED TREE CANOPY:	0.19 AC
PARKLAND	N/A
OPEN SPACE:	N/A

OVERALL DENSITY:	3.64 UNITS/AC
NET DENSITY (MINUS ROW):	3.64 UNITS/AC
NET DENSITY (MINUS ROW AND OVERLAY CONSTRAINTS):	3.88 UNITS/AC
NUMBER OF RESIDENTIAL UNITS BY TYPE:	4 SINGLE FAMILY
NON RESIDENTIAL SQUARE FOOTAGE:	0
TOTAL ACREAGE BY USE, ENTIRE SITE:	1.1 AC RESIDENTIAL
TOTAL ACREAGE BY USE, PER SECTION:	1.1 AC RESIDENTIAL

STATEMENT OF IMPACTS

STREET NETWORK
EDDY LANE IS CATEGORIZED AS A MAJOR COLLECTOR WITH AN EXISTING 30' ROW SECTION AND A PROPOSED 65' ROW SECTION. 21.5' OF ROW FROM THE EXISTING ROW LINE ON THE EAST SIDE OF THE STREET WILL BE REQUIRED FOR DEDICATION. BASED ON THE CITY OF FRANKLIN MAJOR THOROUGHFARE PLAN, THIS PROPOSED DEVELOPMENT WILL NOT ADVERSELY AFFECT PLANS ASSOCIATED WITH PROJECT #21. AVERAGE DAILY TRIPS WILL INCREASE FROM 31 UNDER EXISTING CONDITIONS TO 38 UNDER PROPOSED CONDITIONS.

WATER
WATER WILL BE PROVIDED BY CITY OF FRANKLIN VIA AN EXISTING 6" PIPE RUNNING WITHIN THE PAVEMENT OF EDDY LANE. THERE ARE THREE EXISTING RESIDENTIAL SERVICES THAT WILL CONTINUE TO SERVE THE SITE. ONE ADDITIONAL RESIDENTIAL WATER SERVICE IS PROPOSED. AS THE SITE IS PROPOSED TO GO FROM 2 SINGLE FAMILY AND 1 DUPLEX(4 TOTAL SFUE) TO 4 SINGLE FAMILY HOMES (4SFUE), WATER USE IN GPD IS NOT EXPECTED TO INCREASE ON THIS SITE.

SEWER
SEWER WILL BE PROVIDED BY CITY OF FRANKLIN VIA AN EXISTING 8" PIPE RUNNING WITHIN THE PAVEMENT OF EDDY LANE. THERE ARE THREE EXISTING RESIDENTIAL SERVICES THAT WILL CONTINUE TO SERVE THE SITE. ONE ADDITIONAL RESIDENTIAL SANITARY SEWER SERVICE IS PROPOSED.

RECLAIMED WATER
RECLAIMED WATER IS NOT KNOWN TO BE PRESENT AT THIS SITE, EXTENSIONS ARE NOT PROPOSED.

DRAINAGE FACILITIES
POST DEVELOPMENT PEAK FLOWS WILL BE LESS THAN PRE DEVELOPMENT PEAK FLOWS AND THE OUTFALL LOCATION WILL NOT CHANGE. THE DEVELOPMENT WILL INCREASE IMPERVIOUS AREA FROM 0.26 AC TO 0.41 AC. ALL WATER ON THE SITE WILL BE CONVEYED TO LOW IMPACT DEVELOPMENT STORMWATER TREATMENT AREAS AND THEN ROUTED TO THE PROPOSED DETENTION POND, AND THEN TO THE EXISTING PIPE AT THE SOUTHEAST CORNER OF THE SITE.

POLICE/FIRE
0.92 MILES FROM THE POLICE DEPARTMENT AND 1.3 MILES FROM THE FIRE DEPARTMENT. AS ALL HOMES SHARE FRONTAGE ALONG EDDY LANE, ACCESSIBILITY OF EMERGENCY VEHICLES WILL NOT BE AN ISSUE.

RECREATION/SCHOOLS
WHILE NUMBER OF STRUCTURES WILL INCREASE BY ONE, THIS DEVELOPMENT WILL NOT ADD ANY ADDITIONAL RESIDENTIAL UNITS AND WILL THEREFORE HAVE NO ADVERSE EFFECT ON SURROUNDING SCHOOLS AND RECREATIONAL FACILITIES.

REFUSE COLLECTION
REFUSE COLLECTION SERVICE WILL BE PROVIDED BY THE CITY OF FRANKLIN SOLID WASTE.

RESTRICTIVE COVENANTS
NO HOA WILL BE ESTABLISHED FOR THIS SUBDIVISION

MINERAL RIGHTS
NO THIRD PARTY MINERAL RIGHTS ARE ASSOCIATED WITH THIS PROPERTY.

LAND USE PLAN COMPLIANCE
CHARACTER AREA OVERLAY: CFCO-6
APPLICABLE DEVELOPMENT STANDARD: CONVENTIONAL

LOCAL COMPATIBILITY
THE COTTAGES AT EDDY LANE HAVE COMPARABLE LOT ACREAGE AND FRONT YARD SETBACKS TO THE EXISTING RESIDENCES TO THE SOUTH ON EDDY LANE. THE PROPOSED LOTS WILL CONTINUE THE ESTABLISHED RHYTHM AND CHARACTER OF THE NEIGHBORING HOMES AS WELL.

SIDEWALK
SIDEWALKS TO BE INSTALLED.

STORMWATER MANAGEMENT NARRATIVE:
ON-SITE STORMWATER WILL BE DIRECTED AWAY FROM PROPOSED BUILDINGS VIA POSITIVE DRAINAGE AND SWALES. OVERALL DRAINAGE PATTERNS WILL MIMIC EXISTING CONDITIONS, FLOWING FROM NORTH TO SOUTH AND WEST TO EAST. STORMWATER WILL THEN BE DIRECTED TO PROPOSED BIORETENTION AREAS. OFF-SITE STORMWATER WILL BE DIVERTED AWAY FROM ANY PROPOSED STORMWATER TREATMENT AREAS. THE PROPOSED BIORETENTION AREAS WILL TREAT STORMWATER RUNOFF BEFORE IT EITHER INFILTRATES INTO THE SOIL OR DISCHARGES T THE PROPOSED DETENTION BASIN.

EACH INDIVIDUAL OWNER SHALL BE RESPONSIBLE FOR AND SHALL MAINTAIN THE STORMWATER INFRASTRUCTURE LOCATED ON THE INDIVIDUAL LOT. THESE ITEMS INCLUDE RAIN GARDENS, DETENTION BASINS, AND DRAINAGE SWALES.

OVERALL DEVELOPMENT PLAN

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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COTTAGES AT EDDY LANE
PUD SUBDIVISION, DEVELOPMENT PLAN
FRANKLIN, TENNESSEE

GREGORY C. GAMBLE — REGISTERED LANDSCAPE ARCHITECT — No. 329 — STATE OF TENNESSEE

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
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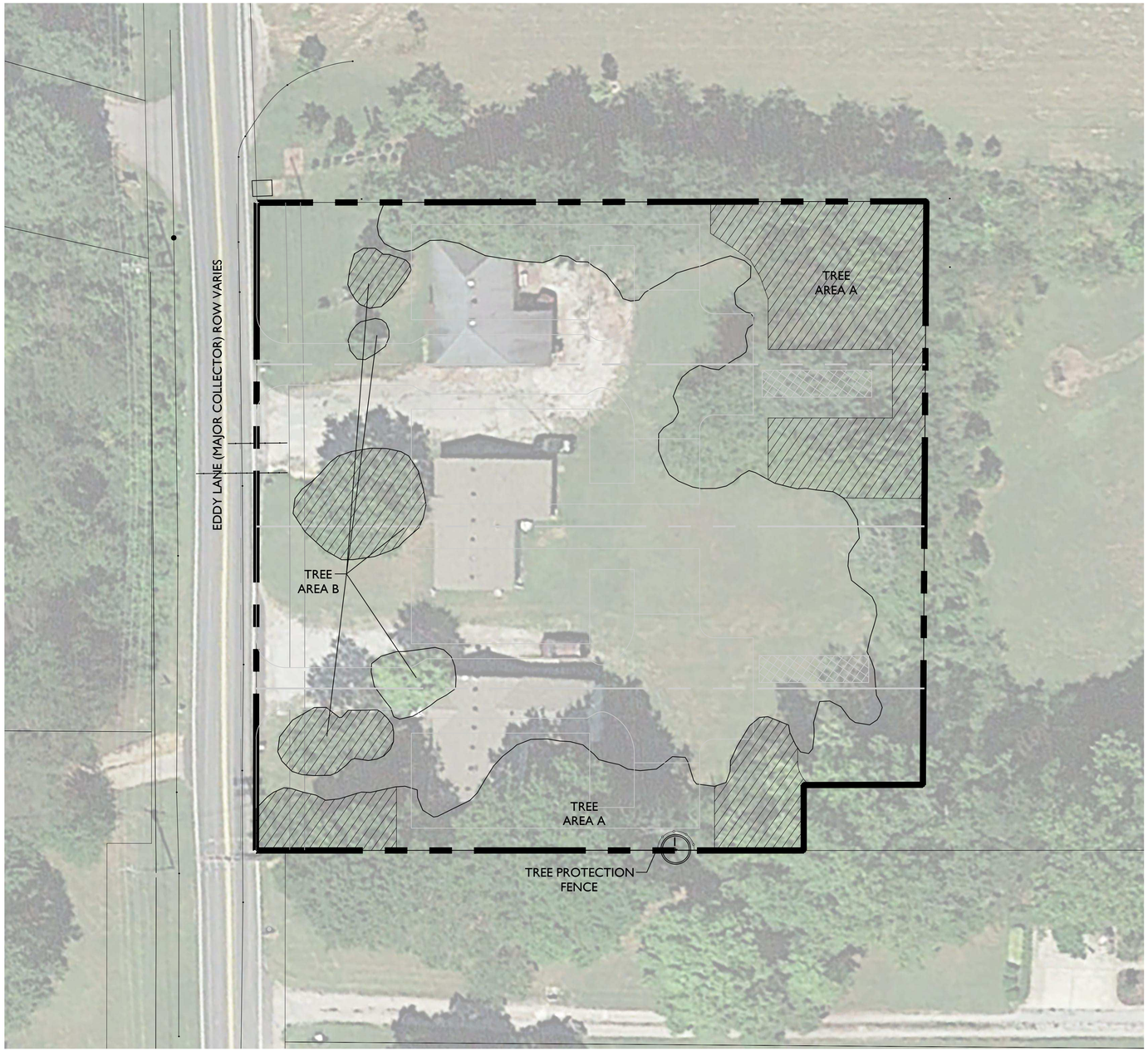
COF # 6084



GRAPHIC SCALE 1"=20'

0 10 20 40 60

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FAX:	(615) 790-1350
EMAIL:	greg.gamble@gdc-tn.com
CONTACT:	GREG GAMBLE

EXISTING TREE CANOPY

BASED ON AERIAL PHOTOGRAPHS OF THE PROPERTY THE EXISTING TREE CANOPY IS APPROXIMATELY 8,098 SF WHICH IS 16.8% OF THE TOTAL SITE

TREE CANOPY DATA

TREE AREA	EXISTING	REMOVED	PRESERVED
TREE A	16,656 SF	10,066 SF	6,590 SF
TREE B	2,855 SF	636 SF	2,219 SF
TOTAL SF	19,511 SF	10,702 SF	8,809 SF

EXISTING TREE CANOPY: 19,511 SF
19,511 SF/48,156 SF = .405 (40.5%) OF TOTAL SITE

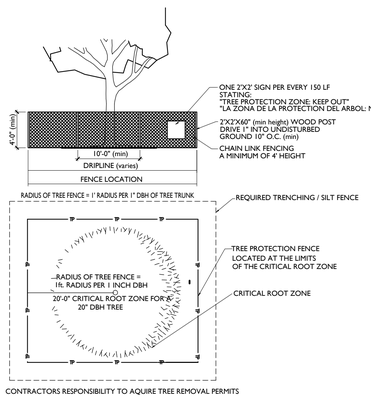
REQUIRED CANOPY PRESERVATION =
45% OF TOTAL CANOPY
19,511 SF * 45% = 8,780 SF

PROVIDED CANOPY PRESERVATION =
8,809 SF (45% OF TOTAL CANOPY)

SPECIMEN TREE LIST

NUMBER	TYPE	SIZE	HEALTH	STATUS
1	HACKBERRY	26"	GOOD	RETAINED

TOTAL HEALTHY INCHES REMOVED: 0"
TOTAL REPLACEMENT INCHES REQUIRED: 0"



TREE PROTECTION FENCING DETAIL

TREE PROTECTION NOTES:

1. The tree protection barriers shall be constructed before the issuance of any permits, and shall remain intact throughout the entire period of construction.

2. The tree protection barrier shall be installed as labeled on this plan or a distance to the radius of the dripline, whichever is greatest, as measured from the trunk of the protected tree.

3. Any required excavation in or around the protection zone to accommodate underground services, footings, etc; shall be indicated on the plan, and shall be excavated by hand. In addition, related root pruning shall be accomplished via ANSI A-300-95 standard so as to minimize impact on the general root system.

4. The storage of building materials or stock piling shall not be permitted within the limits of or against the protection barriers.

5. Trees within the protection barriers must be adequately cared for throughout the construction process (i.e., they must be watered sufficiently). Fill shall not be placed upon the root system as to endanger the health or life of the affected tree.

TREE PRESERVATION PLAN

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DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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COTTAGES AT EDDY LANE

PUD SUBDIVISION, DEVELOPMENT PLAN

FRANKLIN, TENNESSEE

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
SUITE 230
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GREG GAMBLE
greggamble209@gmail.com
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COF # 6084

COF GRADING & DRAINAGE GENERAL NOTES

1. GRADING PERMIT IS REQUIRED FOR ANY PROJECT DISTURBING MORE THAN 10,000 SF, ADDING MORE THAN 5,000 SF OF IMPERVIOUS SURFACE OR FOR ANY SITE GRADING REQUIRING STOCKPILING OF MATERIAL.
2. THE DEVELOPER SHALL PROVIDE THE NECESSARY LABOR AND SUPERVISION REQUIRED TO SUPPORT FIELD TESTING BY THE INDEPENDENT TESTING FIRM AND INSPECTIONS BY CITY OFFICIALS AT NO COST TO THE CITY. TEST REPORTS OF FIELD TESTING IF APPLICABLE SHALL BE SUBMITTED DIRECTLY TO THE STREET DEPARTMENT. DEFECTS DISCLOSED BY TESTS SHALL BE RECTIFIED.
3. AN AUTHORIZED REPRESENTATIVE OF THE CITY SHALL MAKE A FINAL INSPECTION OF THE PROJECT AFTER COMPLETION TO DETERMINE ACCEPTABILITY OF THE WORK AND FOR RELEASE OF PERFORMANCE BONDS IF REQUIRED. BEFORE THIS FINAL INSPECTION CAN BE MADE, THE ENGINEER RESPONSIBLE FOR THE PROJECT SHALL CERTIFY IN WRITING TO THE CITY ENGINEER THAT THE WORK HAS BEEN COMPLETED IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS.
4. DRAINAGE FACILITIES INCLUDING, BUT NOT LIMITED TO, CULVERTS, DETENTION BASINS AND DITCHES, AS WELL AS THE ROADWAY SUB-GRADE, BASE STONE AND BINDER & SURFACE COARSE SHALL BE INSPECTED, TESTED AND GIVEN APPROVAL AT EACH STAGE OF INSTALLATION PRIOR TO PROCEEDING TO THE NEXT STAGE OF CONSTRUCTION. FINAL CONSTRUCTION INSPECTION FOR APPROVAL AND ACCEPTANCE OF STREETS AND DRAINAGE SYSTEMS WILL NOT BE GRANTED UNTIL ALL WORK HAS BEEN COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS.
5. LOCATING AND COORDINATION FOR THE RELOCATION OF EXISTING UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR. TENNESSEE'S ONE-CALL AND THE CITY OF FRANKLIN UTILITY LOCATION SERVICE SHALL BE UTILIZED IN ADDITION TO COORDINATION WITH LOCAL UTILITY OWNERS. THE CONTRACTOR SHALL AT ALL TIMES PROTECT EXISTING UTILITIES AND WILL BE RESPONSIBLE FOR COSTS DUE TO DAMAGE CAUSED TO ANY UTILITY LINES.

STORMWATER MANAGEMENT NARRATIVE

ON-SITE STORMWATER WILL BE DIRECTED AWAY FROM PROPOSED BUILDINGS VIA POSITIVE DRAINAGE AND SWALES. OVERALL DRAINAGE PATTERNS WILL MIMIC EXISTING CONDITIONS, FLOWING FROM NORTH TO SOUTH AND WEST TO EAST. STORMWATER WILL THEN BE DIRECTED TO PROPOSED BIORETENTION AREAS. OFF-SITE STORMWATER WILL BE DIVERTED AWAY FROM ANY PROPOSED STORMWATER TREATMENT AREAS. THE PROPOSED BIORETENTION AREAS WILL TREAT STORMWATER RUNOFF BEFORE IT EITHER INFILTRATES INTO THE SOIL OR DISCHARGES T THE PROPOSED DETENTION BASIN.

SITE DATA CHART

• SITE AREA:	1.11 AC
• IMPERVIOUS AREA:	0.41 AC
• DISTURBED AREA	± 1.00 AC
• Rv VALUE:	TBD

IMPACT STATEMENT

WATER
WATER WILL BE PROVIDED BY CITY OF FRANKLIN VIA AN EXISTING 6" PIPE RUNNING WITHIN THE PAVEMENT OF EDDY LANE. THERE ARE THREE EXISTING RESIDENTIAL SERVICES THAT WILL CONTINUE TO SERVE THE SITE, ONE ADDITIONAL RESIDENTIAL WATER SERVICE IS PROPOSED, AS THE SITE IS PROPOSED TO GO FROM 2 SINGLE FAMILY AND 1 DUPLEX(4 TOTAL SFUE) TO 4 SINGLE FAMILY HOMES (4SFUE), WATER USE IN GPD IS NOT EXPECTED TO INCREASE ON THIS SITE.

SEWER
SEWER WILL BE PROVIDED BY CITY OF FRANKLIN VIA AN EXISTING 8" PIPE RUNNING WITHIN THE PAVEMENT OF EDDY LANE. THERE ARE THREE EXISTING RESIDENTIAL SERVICES THAT WILL CONTINUE TO SERVE THE SITE, ONE ADDITIONAL RESIDENTIAL SANITARY SEWER SERVICE IS PROPOSED.

RECLAIMED WATER
RECLAIMED WATER IS NOT KNOWN TO BE PRESENT AT THIS SITE, EXTENSIONS ARE NOT PROPOSED.

DRAINAGE FACILITIES
POST DEVELOPMENT PEAK FLOWS WILL BE LESS THAN PRE DEVELOPMENT PEAK FLOWS AND THE OUTFALL LOCATION WILL NOT CHANGE. THE DEVELOPMENT WILL INCREASE IMPERVIOUS AREA FROM 0.26 AC TO 0.41 AC. ALL WATER ON THE SITE WILL BE CONVEYED TO LOW IMPACT DEVELOPMENT STORMWATER TREATMENT AREAS AND THEN ROUTED TO THE PROPOSED DETENTION POND, AND THEN TO THE EXISTING PIPE AT THE SOUTHEAST CORNER OF THE SITE.

CONTACT INFORMATION

WATER AND SEWER CITY OF FRANKLIN-BEN MCNEIL 124 LUMBER DRIVE 615-550-6855	GAS ATMOS GAS-RON MYATT 200 NOAH DRIVE 615-794-2596
STORMWATER CITY OF FRANKLIN-JEFF WILLOUGHBY 109 3RD AVE SOUTH 615-550-6651	ELECTRIC MTEMC-GARY OSBURN 2156 EDWARD CURD LANE 615-595-4677

UTILITY PLAN DATA CHART

• FACILITY TYPE:	RESIDENTIAL-SINGLE FAMILY
• UNIT FLOW IN GPD:	350 GPD PER HOME
• NUMBER OF UNITS	4
• TOTAL FLOW IN GPD:	1400

UTILITY NARRATIVE

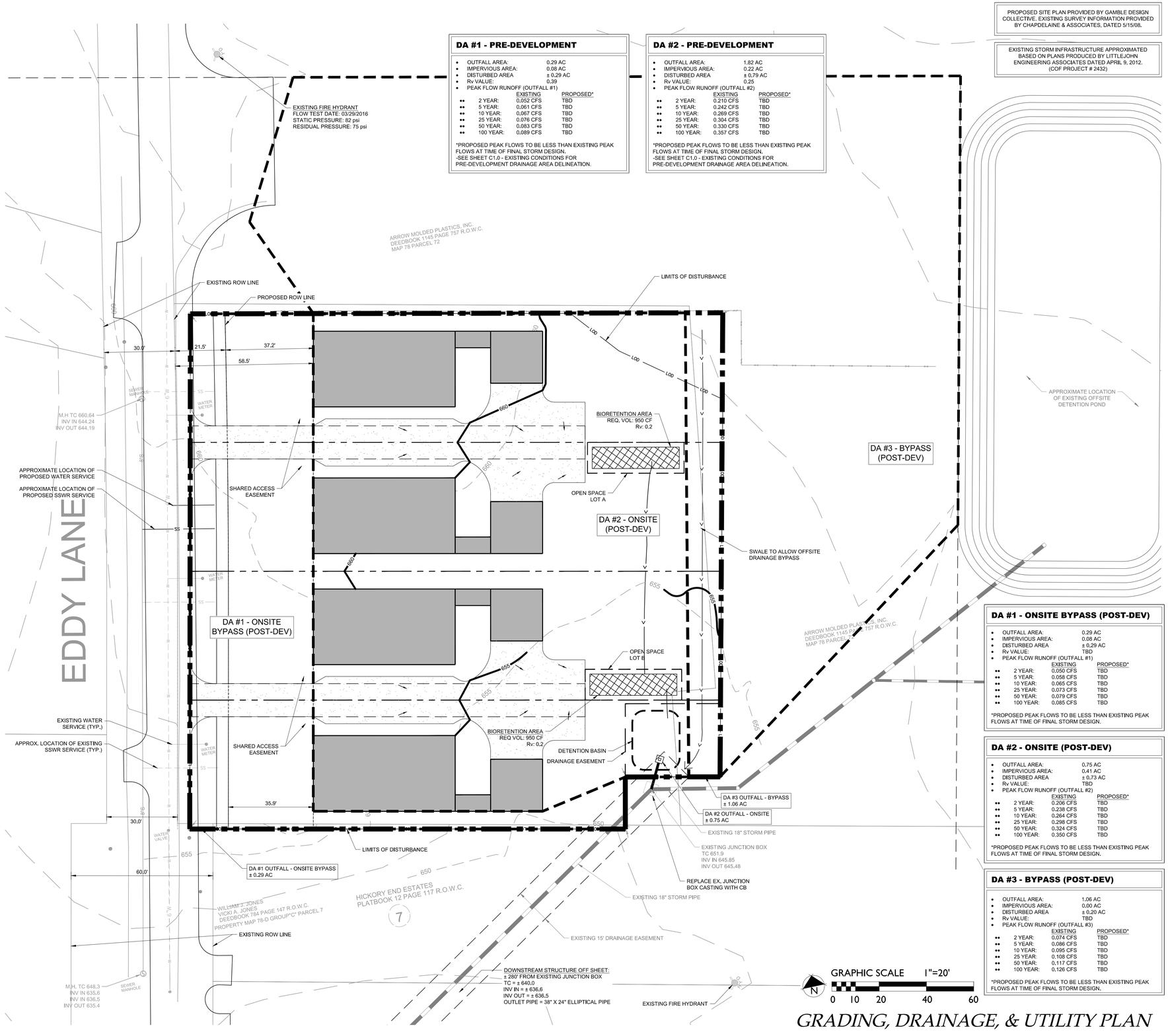
WATER AND SEWER SERVICES WILL BE INSTALLED AT TIME OF CONSTRUCTION. PAVEMENT CUTS MAY BE NECESSARY FOR PROPOSED WATER AND SEWER SERVICE CONNECTIONS TO BE MADE.

EXISTING UTILITIES NOTE

CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES AND NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES AND/OR CONFLICTS WITH EXISTING OR PROPOSED UTILITIES PRIOR TO PROCEEDING. COF DOES NOT PARTICIPATE IN 811/TN ONE CALL. CONTACT COF WATER/SEWER DEPT. FOR LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

UTILITY NOTES

1. CONTRACTOR RESPONSIBLE FOR VERIFYING EXISTING ELEVATIONS COMPARED TO THOSE SHOWN ON PLAN PRIOR TO GRADING. NOTIFY OWNER'S REPRESENTATIVE IF DISCREPANCIES ARE FOUND.
2. AREAS FOR CONSTRUCTION THAT REQUIRE DE-WATERING FOR EXCAVATION WILL BE DONE AT NO ADDITIONAL COST TO THE OWNER.
3. ALL WATER AND SEWER MATERIALS AND CONSTRUCTION SHALL BE IN COMPLIANCE WITH CITY OF FRANKLIN'S STANDARD SPECIFICATIONS.
4. MAINTAIN MINIMUM 10 FEET HORIZONTAL SEPARATION BETWEEN WATER & SANITARY SEWER OR 18" VERTICAL SEPARATION AT CROSSING LOCATIONS.
5. REFER TO CITY OF FRANKLIN WATER & SEWER STANDARD SPECIFICATIONS FOR PIPE BEDDING REQUIREMENTS.
6. ALL WATER VALVES TO BE LOCATED OUTSIDE OF PAVED AREAS WHERE POSSIBLE.
7. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF AS-BUILT DRAWINGS OF WATER & SANITARY SEWER CONSTRUCTION PRIOR TO THE ACCEPTANCE OF THE PUBLIC UTILITIES.
8. IT SHALL BE THE RESPONSIBILITY OF THE OWNER OF LOT 2 TO MAINTAIN OPEN SPACE LOT A.
9. IT SHALL BE THE RESPONSIBILITY OF THE OWNER OF LOT 3 TO MAINTAIN OPEN SPACE LOT B.
10. IT SHALL BE THE RESPONSIBILITY OF THE OWNER OF LOT 4 TO MAINTAIN THE DETENTION POND.



DA #1 - ONSITE BYPASS (POST-DEV)

- OUTFALL AREA: 0.29 AC
- IMPERVIOUS AREA: 0.08 AC
- DISTURBED AREA ± 0.29 AC
- Rv VALUE: TBD
- PEAK FLOW RUNOFF (OUTFALL #1)

	EXISTING	PROPOSED*
•• 2 YEAR:	0.050 CFS	TBD
•• 5 YEAR:	0.058 CFS	TBD
•• 10 YEAR:	0.065 CFS	TBD
•• 25 YEAR:	0.073 CFS	TBD
•• 50 YEAR:	0.079 CFS	TBD
•• 100 YEAR:	0.085 CFS	TBD

*PROPOSED PEAK FLOWS TO BE LESS THAN EXISTING PEAK FLOWS AT TIME OF FINAL STORM DESIGN.

DA #2 - ONSITE (POST-DEV)

- OUTFALL AREA: 0.75 AC
- IMPERVIOUS AREA: 0.41 AC
- DISTURBED AREA ± 0.73 AC
- Rv VALUE: TBD
- PEAK FLOW RUNOFF (OUTFALL #2)

	EXISTING	PROPOSED*
•• 2 YEAR:	0.206 CFS	TBD
•• 5 YEAR:	0.238 CFS	TBD
•• 10 YEAR:	0.264 CFS	TBD
•• 25 YEAR:	0.298 CFS	TBD
•• 50 YEAR:	0.324 CFS	TBD
•• 100 YEAR:	0.350 CFS	TBD

*PROPOSED PEAK FLOWS TO BE LESS THAN EXISTING PEAK FLOWS AT TIME OF FINAL STORM DESIGN.

DA #3 - BYPASS (POST-DEV)

- OUTFALL AREA: 1.06 AC
- IMPERVIOUS AREA: 0.00 AC
- DISTURBED AREA ± 0.20 AC
- Rv VALUE: TBD
- PEAK FLOW RUNOFF (OUTFALL #3)

	EXISTING	PROPOSED*
•• 2 YEAR:	0.074 CFS	TBD
•• 5 YEAR:	0.086 CFS	TBD
•• 10 YEAR:	0.095 CFS	TBD
•• 25 YEAR:	0.108 CFS	TBD
•• 50 YEAR:	0.117 CFS	TBD
•• 100 YEAR:	0.126 CFS	TBD

*PROPOSED PEAK FLOWS TO BE LESS THAN EXISTING PEAK FLOWS AT TIME OF FINAL STORM DESIGN.

GRADING, DRAINAGE, & UTILITY PLAN

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

Kimley»Horn
214 Oceanside Drive, Nashville, TN 37204
Main: 615.564.2701 | www.kimley-horn.com

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COTTAGES AT EDDY LANE
PUD SUBDIVISION, DEVELOPMENT PLAN
FRANKLIN, TENNESSEE

RYAN McMASTER — REGISTERED — CIVIL ENGINEER — No. 108032 — STATE OF TENNESSEE — 4/7/16

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
SUITE 230
FRANKLIN, TENNESSEE 37064
GREG GAMBLE
greggamble209@gmail.com
615.975.5765

rev. date
△ _____
△ _____
△ _____
△ _____

GDC Job No. 15024
MARCH 14, 2016

SHEET
C3.0

COF # 6084

STANDARD HOME FRONT ELEVATIONS
CONCEPTUAL ONLY / NOT FOR APPROVAL

ELEVATIONS PROVIDED BY: ZACH MCKINNEY AT CAPSTONE HOMES, LLC

GENERAL ARCHITECTURAL ELEVATION NOTES:

1. Elevations shown are typical for this development. Final design plans shall be submitted with the request for building permits and shall indicate compliance with the City of Franklin's architectural design standards.
2. Materials include concrete board with stone and brick accents.
3. Tabulations will be provided at site plan as elevations are conceptual at this point.
5. Typical square footage will range from 2,800 to 3,200 sf.
6. Two car garage in rear.

The elevations shown here are representative of the buildings planned for this project. They are the basis for design review by the City of Franklin at the time of building permit. Based on my professional experience, the plans presented meet or exceed the design standards set forth by the City of Franklin.

Greg Gamble, Registered Landscape Architect.

TYPICAL ARCHITECTURE

GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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COTTAGES AT EDDY LANE

PUD SUBDIVISION, DEVELOPMENT PLAN

FRANKLIN, TENNESSEE

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
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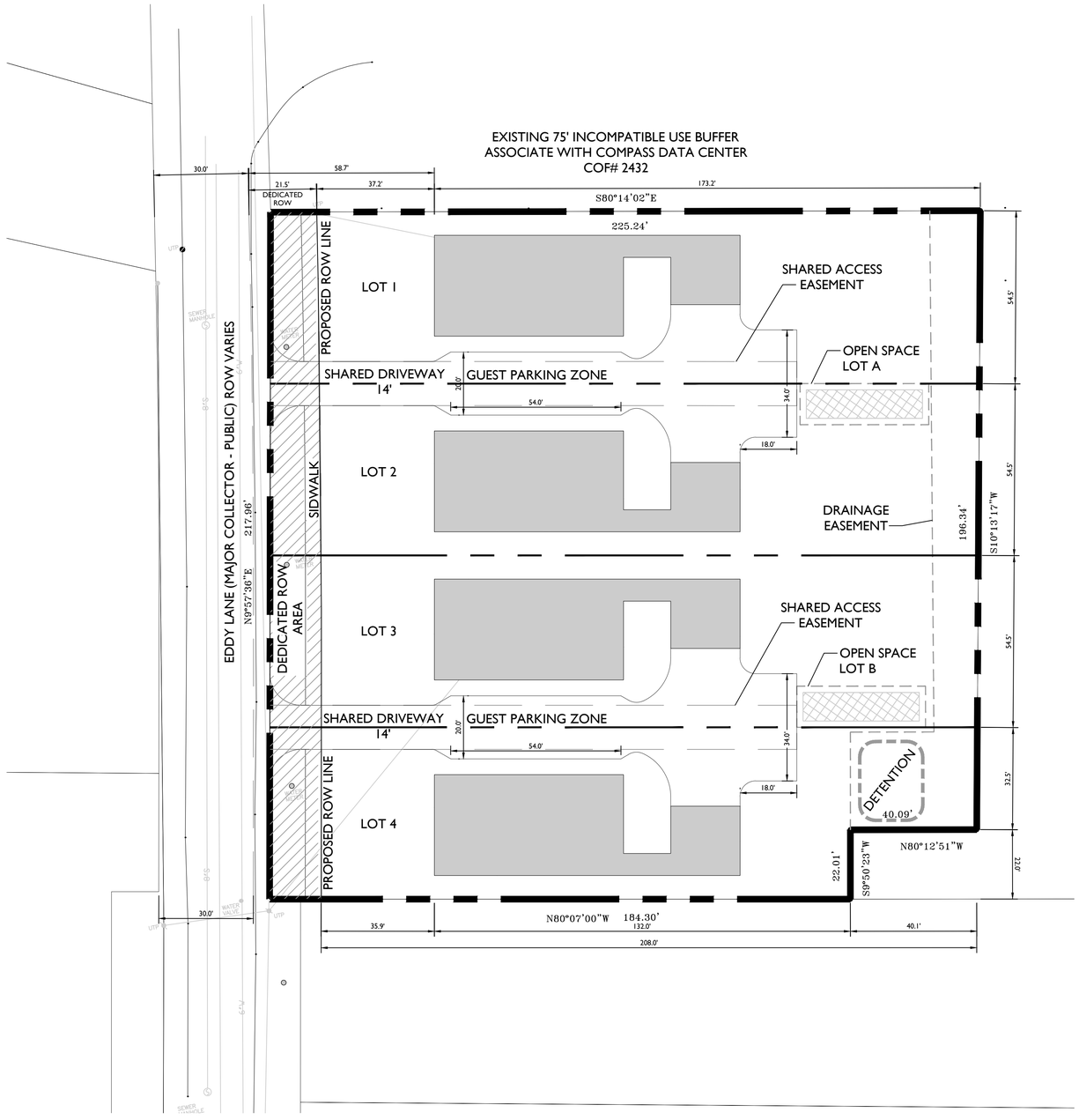

THE INFORMATION SHOWN ON THIS PLAN IS BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIP ZONE 4100 AND NAD 83 DATUM.

LOT AREAS

LOT #	LOT SF	LOT ACREAGE
LOT 1	11,445 SF	0.26 AC
LOT 2	11,391 SF	0.26 AC
LOT 3	11,336 SF	0.26 AC
LOT 4	10,456 SF	0.24 AC
OPEN SPACE LOT A	533 SF	0.01 AC
OPEN SPACE LOT B	533 SF	0.01 AC

SITE DATA:

PROJECT NAME:	COTTAGES AT EDDY LANE
PROJECT NUMBER:	6084
SUBDIVISION:	NA
LOT NUMBER:	NA
ADDRESS:	405 EDDY LANE,
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 78, PARCEL 71.00
EXISTING ZONING:	LIGHT INDUSTRIAL
PROPOSED ZONING:	SD-R(3.64)
CHARACTER AREA OVERLAY:	CFCO-4
OTHER APPLICABLE OVERLAYS	NONE
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
TOTAL ACREAGE:	1.1 AC
TOTAL SQUARE FOOTAGE:	48,156 SF
MINIMUM REQUIRED SETBACKS:	
FRONT YARD:	35'
REAR YARD:	30'
SIDE YARD:	MIN 7.5' 12' BETWEEN STRUCTURES
OWNER / APPLICANT:	AVENUE 11 DEVELOPMENT
ADDRESS:	1577 WOODMONT BLVD. NASHVILLE, TN 37215
OWNER:	(615) 972-9568
EMAIL:	kurt@ave11dev.com
CONTACT:	KURT DENNY
ENGINEER:	KIMLEY-HORN
ADDRESS:	214 OCEANSIDE DRIVE, NASHVILLE, TN 37204
PHONE:	(615) 564-2701
EMAIL:	ryan.mcmaster@kimley-horn.com
CONTACT:	RYAN MCMASTER
LANDSCAPE ARCHITECT :	GAMBLE DESIGN COLLABORATIVE
ADDRESS:	144 S.E. PARKWAY, SUITE 200, FRANKLIN, TN 37064
PHONE:	(615) 975-5765
FAX:	(615) 790-1350
EMAIL:	greg.gamble@gdc-tn.com
CONTACT:	GREG GAMBLE
BUILDING SQUARE FOOTAGE:	2,800 - 3,200 SF
BUILDING HEIGHT:	3 STORY MAX
LANDSCAPE SURFACE RATIO:	.40
MINIMUM LANDSCAPE RATIO:	.20
INCOMPATIBLE-USE BUFFER REQUIRED:	NOT REQUIRED
MINIMUM PARKING REQUIRED:	2 PER HOME
EXISTING PARKING:	N/A
PARKING PROVIDED:	3 PER HOME
RESIDENTIAL DENSITY:	3.64 DUA (4 SINGLE FAMILY DETACHED HOMES)
EXISTING TREE CANOPY:	0.19 AC
PRESERVED TREE CANOPY:	0.19 AC
PARKLAND	N/A
OPEN SPACE:	N/A

OVERALL DENSITY:	3.64 UNITS/AC
NET DENSITY (MINUS ROW):	3.64 UNITS/AC
NET DENSITY (MINUS ROW AND OVERLAY CONSTRAINTS):	3.88 UNITS/AC
NUMBER OF RESIDENTIAL UNITS BY TYPE:	4 SINGLE FAMILY
NON RESIDENTIAL SQUARE FOOTAGE:	0
TOTAL ACREAGE BY USE, ENTIRE SITE:	1.1 AC RESIDENTIAL
TOTAL ACREAGE BY USE, PER SECTION:	1.1 AC RESIDENTIAL

STATEMENT OF IMPACTS

STREET NETWORK
EDDY LANE IS CATEGORIZED AS A MAJOR COLLECTOR WITH AN EXISTING 30' ROW SECTION AND A PROPOSED 65' ROW SECTION. 21.5' OF ROW FROM THE EXISTING ROW LINE ON THE EAST SIDE OF THE STREET WILL BE REQUIRED FOR DEDICATION. BASED ON THE CITY OF FRANKLIN MAJOR THOROUGHFARE PLAN, THIS PROPOSED DEVELOPMENT WILL NOT ADVERSELY AFFECT PLANS ASSOCIATED WITH PROJECT #21. AVERAGE DAILY TRIPS WILL INCREASE FROM 31 UNDER EXISTING CONDITIONS TO 38 UNDER PROPOSED CONDITIONS.

WATER
WATER WILL BE PROVIDED BY CITY OF FRANKLIN VIA AN EXISTING 6" PIPE RUNNING WITHIN THE PAVEMENT OF EDDY LANE. THERE ARE THREE EXISTING RESIDENTIAL SERVICES THAT WILL CONTINUE TO SERVE THE SITE. ONE ADDITIONAL RESIDENTIAL WATER SERVICE IS PROPOSED. AS THE SITE IS PROPOSED TO GO FROM 2 SINGLE FAMILY AND 1 DUPLEX(4 TOTAL SFUE) TO 4 SINGLE FAMILY HOMES (4SFUE), WATER USE IN GPD IS NOT EXPECTED TO INCREASE ON THIS SITE.

SEWER
SEWER WILL BE PROVIDED BY CITY OF FRANKLIN VIA AN EXISTING 8" PIPE RUNNING WITHIN THE PAVEMENT OF EDDY LANE. THERE ARE THREE EXISTING RESIDENTIAL SERVICES THAT WILL CONTINUE TO SERVE THE SITE. ONE ADDITIONAL RESIDENTIAL SANITARY SEWER SERVICE IS PROPOSED.

RECLAIMED WATER
RECLAIMED WATER IS NOT KNOWN TO BE PRESENT AT THIS SITE, EXTENSIONS ARE NOT PROPOSED.

DRAINAGE FACILITIES
POST DEVELOPMENT PEAK FLOWS WILL BE LESS THAN PRE DEVELOPMENT PEAK FLOWS AND THE OUTFALL LOCATION WILL NOT CHANGE. THE DEVELOPMENT WILL INCREASE IMPERVIOUS AREA FROM 0.26 AC TO 0.41 AC. ALL WATER ON THE SITE WILL BE CONVEYED TO LOW IMPACT DEVELOPMENT STORMWATER TREATMENT AREAS AND THEN ROUTED TO THE PROPOSED DETENTION POND, AND THEN TO THE EXISTING PIPE AT THE SOUTHEAST CORNER OF THE SITE.

POLICE/FIRE
0.92 MILES FROM THE POLICE DEPARTMENT AND 1.3 MILES FROM THE FIRE DEPARTMENT. AS ALL HOMES SHARE FRONTAGE ALONG EDDY LANE, ACCESSIBILITY OF EMERGENCY VEHICLES WILL NOT BE AN ISSUE.

RECREATION/SCHOOLS
WHILE NUMBER OF STRUCTURES WILL INCREASE BY ONE, THIS DEVELOPMENT WILL NOT ADD ANY ADDITIONAL RESIDENTIAL UNITS AND WILL THEREFORE HAVE NO ADVERSE EFFECT ON SURROUNDING SCHOOLS AND RECREATIONAL FACILITIES.

REFUSE COLLECTION
REFUSE COLLECTION SERVICE WILL BE PROVIDED BY THE CITY OF FRANKLIN SOLID WASTE.

RESTRICTIVE COVENANTS
NO HOA WILL BE ESTABLISHED FOR THIS SUBDIVISION

MINERAL RIGHTS
NO THIRD PARTY MINERAL RIGHTS ARE ASSOCIATED WITH THIS PROPERTY.

LAND USE PLAN COMPLIANCE
CHARACTER AREA OVERLAY: CFCO-6
APPLICABLE DEVELOPMENT STANDARD: CONVENTIONAL

LOCAL COMPATIBILITY
THE COTTAGES AT EDDY LANE HAVE COMPARABLE LOT ACREAGE AND FRONT YARD SETBACKS TO THE EXISTING RESIDENCES TO THE SOUTH ON EDDY LANE. THE PROPOSED LOTS WILL CONTINUE THE ESTABLISHED RHYTHM AND CHARACTER OF THE NEIGHBORING HOMES AS WELL.

SIDEWALK
SIDEWALKS TO BE INSTALLED.

STORMWATER MANAGEMENT NARRATIVE:
ON-SITE STORMWATER WILL BE DIRECTED AWAY FROM PROPOSED BUILDINGS VIA POSITIVE DRAINAGE AND SWALES. OVERALL DRAINAGE PATTERNS WILL MIMIC EXISTING CONDITIONS, FLOWING FROM NORTH TO SOUTH AND WEST TO EAST. STORMWATER WILL THEN BE DIRECTED TO PROPOSED BIORETENTION AREAS. OFF-SITE STORMWATER WILL BE DIVERTED AWAY FROM ANY PROPOSED STORMWATER TREATMENT AREAS. THE PROPOSED BIORETENTION AREAS WILL TREAT STORMWATER RUNOFF BEFORE IT EITHER INFILTRATES INTO THE SOIL OR DISCHARGES T THE PROPOSED DETENTION BASIN.

EACH INDIVIDUAL OWNER SHALL BE RESPONSIBLE FOR AND SHALL MAINTAIN THE STORMWATER INFRASTRUCTURE LOCATED ON THE INDIVIDUAL LOT. THESE ITEMS INCLUDE RAIN GARDENS, DETENTION BASINS, AND DRAINAGE SWALES.

OVERALL DEVELOPMENT PLAN

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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COTTAGES AT EDDY LANE
PUD SUBDIVISION, DEVELOPMENT PLAN
FRANKLIN, TENNESSEE

GREGORY C. GAMBLE — REGISTERED LANDSCAPE ARCHITECT — No. 329 — STATE OF TENNESSEE

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
SUITE 230
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GREG GAMBLE
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FRANKLIN, TENNESSEE

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REGISTERED
LANDSCAPE ARCHITECT

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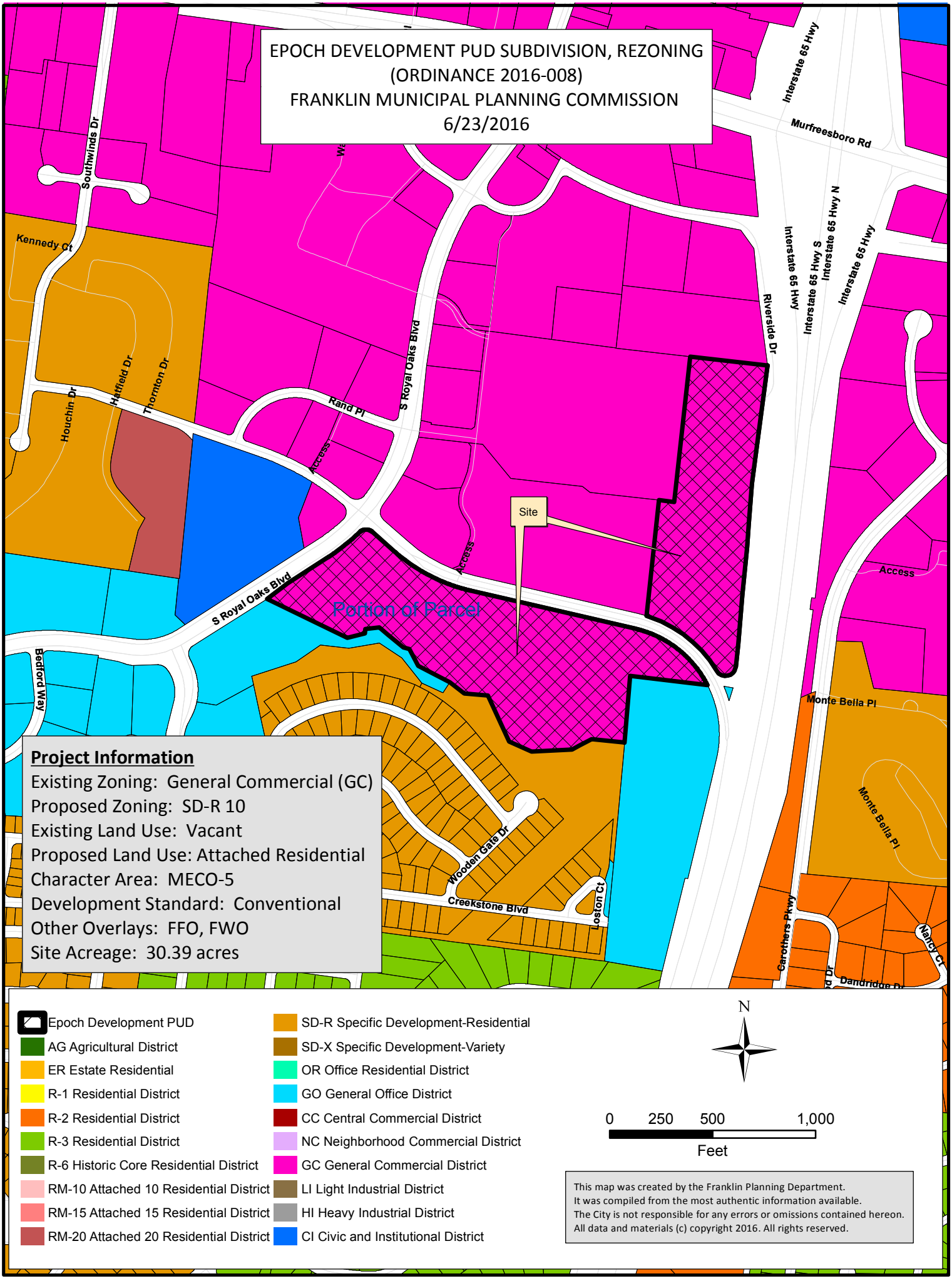
EPOCH DEVELOPMENT PUD SUBDIVISION, REZONING
(ORDINANCE 2016-008)
FRANKLIN MUNICIPAL PLANNING COMMISSION
6/23/2016
Project Information
Existing Zoning: General Commercial (GC)
Proposed Zoning: SD-R 10
Existing Land Use: Vacant
Proposed Land Use: Attached Residential
Character Area: MECO-5
Development Standard: Conventional
Other Overlays: FFO, FWO
Site Acreage: 30.39 acres
Site
Portion of Parcel
Southwinds Dr
Kennedy Ct
Houchin Dr
Hatfield Dr
Thornton Dr
Rand Pl
S Royal Oaks Blvd
Access
Bedford Way
Murfreesboro Rd
Interstate 65 Hwy
Interstate 65 Hwy S
Interstate 65 Hwy N
Riverside Dr
Monte Bella Pl
Wooden Gate Dr
Creekstone Blvd
Loston Ct
Carothers Pkwy
Nancy Ct
Epoch Development PUD
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0 250 500 1,000
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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ORDINANCE 2016-008

TO BE ENTITLED, "AN ORDINANCE TO REZONE 30.39 ACRES FROM GENERAL COMMERCIAL (GC) DISTRICT TO SPECIFIC DEVELOPMENT-RESIDENTIAL (SD-R 10) DISTRICT FOR THE PROPERTY LOCATED WEST OF INTERSTATE 65, AT 840 AND 880 OAK MEADOW DRIVE."

WHEREAS, the City of Franklin, Tennessee, encourages responsible growth and the sensible transition of land uses and densities; and

WHEREAS, the Specific Development-Residential district provides zoning for land uses compatible with both the Franklin Land Use Plan and surrounding development; and

WHEREAS, the Board of Mayor and Alderman (BOMA) of the City of Franklin, Tennessee, adopted Resolution 2016-20, approving a Plan Unit Development (PUD) Development Plan as required by the Franklin Zoning Ordinance; and

WHEREAS, the zoning has been reviewed and approved by BOMA after a public hearing and a recommendation by the Franklin Municipal Planning Commission.

NOW THEREFORE BE IT ORDAINED BY THE BOARD OF MAYOR AND ALDERMAN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That the following described property shall be, and is hereby, rezoned from its present zoning classification of **GC** District to **SD-R (10.0)** District:

PREMISES CONSIDERED

Map-Parcel	Acres
79-88 (portion of)	13.06
79-101.19	17.33
Total	30.39

LOT 24
MAP 79, PORTION OF PARCEL 88.00
SURVEY TRACT 1

A TRACT OF LAND IN THE NINTH CIVIL DISTRICT OF WILLIAMSON COUNTY, CITY OF FRANKLIN, TENNESSEE AND BEING GENERALLY BOUNDED ON THE NORTH BY OAK MEADOW DRIVE, (RIGHT-OF-WAY WIDTH VARIES), ON THE EAST BY NASHVILLE LODGE NO. 72, B.P.O. ELKS, RECORDED IN DEED BOOK 1708, PAGE 12, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE (R.O.W.C.,T.) ON THE SOUTH BY OPEN SPACE LOT 808 AS SHOWN ON THE PLAN ENTITLED "CREEKSTONE COMMONS, P.U.D SUBDIVISION, SECTION FOUR" OF RECORD IN PLAT BOOK P58, PAGE 10, R.O.W.C.,T. AND LOT 27 AS SHOWN ON THE PLAN ENTITLED "CREEKSTONE COMMONS, REVISION FOUR" OF RECORD IN PLAT BOOK P49, PAGE 110, R.O.W.C.,T. AND ON THE WEST BY THE REMAINDER OF LOT 24 OF FINAL PLAN OF WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, OF RECORD IN PLAT BOOK 29, PAGE 139, R.O.W.C.T AND BEING DESCRIBED ACCORDING TO A SURVEY DATED OCTOBER 15, 2015 AND PREPARED BY KEVIN L. BIRDWELL, R.L.S. NO. 1797 WHOSE ADDRESS IS RAGAN SMITH ASSOCIATES, 315 WOODLAND STREET, NASHVILLE, TN 37206 AND BEING MORE

PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING IN THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND BEING THE SOUTH END OF A CURVE AT THE INTERSECTION OF THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND PROCEEDING AS FOLLOWS:
THENCE, WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 72.76 FEET, A CENTRAL ANGLE OF 83 DEGREES 22 MINUTES 19 SECONDS, AND A CHORD BEARING AND DISTANCE OF NORTH 89 DEGREES 31 MINUTES 21 SECONDS EAST, 66.50 FEET TO AN IRON ROD (NEW) WITH CAP STAMPED (RSA) IN THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE;
THENCE, WITH THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE THE FOLLOWING TWO CALLS:
1. SOUTH 48 DEGREES 47 MINUTES 29 SECONDS EAST, 121.81 FEET;
2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 820.00 FEET, AN ARC LENGTH OF 71.61 FEET, A CENTRAL ANGLE OF 05 DEGREES 00 MINUTES 12 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 51 DEGREES 17 MINUTES 35 SECONDS EAST, 71.58 FEET TO AN IRON ROD (NEW) WITH CAP STAMPED (RSA), THE **POINT OF BEGINNING** OF THE HEREIN DESCRIBED TRACT OF LAND AND PROCEEEDING AS FOLLOWS:
THENCE, WITH SAID SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE THE FOLLOWING THREE CALLS:
1. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 820.00 FEET, AN ARC LENGTH OF 330.94 FEET, A CENTRAL ANGLE OF 23 DEGREES 07 MINUTES 24 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 65 DEGREES 21 MINUTES 21 SECONDS EAST, 328.69 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. SOUTH 76 DEGREES 55 MINUTES 03 SECONDS EAST, 834.46 FEET TO AN IRON ROD (NEW)WITH CAP STAMPED (RSA);
3. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 537.96 FEET, AN ARC LENGTH OF 464.57 FEET, A CENTRAL ANGLE OF 49 DEGREES 28 MINUTES 46 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 52 DEGREES 10 MINUTES 40 SECONDS EAST, 450.27 FEET TO AN IRON ROD (NEW)WITH CAP STAMPED (RSA);
THENCE, LEAVING THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND WITH THE NORTH LINE OF THE NASHVILLE LODGE NO. 72, B.P.O. ELKS PROPERTY, NORTH 83 DEGREES 59 MINUTES 15 SECONDS WEST, 376.29 FEET TO A 1/2 INCH DIAMETER IRON ROD (OLD),
THENCE, WITH THE WEST LINE OF THE NASHVILLE LODGE NO. 72, B.P.O. ELKS PROPERTY, SOUTH 05 DEGREES 14 MINUTES 00 SECONDS WEST, PASSING A WITNESS IRON ROD (NEW) ON THE NORTH SIDE OF WATSON BRANCH AT A DISTANCE OF 298.26 AND A TOTAL DISTANCE OF 323.26 FEET TO A POINT IN THE CENTER OF WATSON BRANCH, SAID POINT BEING THE NORTHEAST CORNER OF LOT 808 ON SAID PLAN OF CREEKSTONE COMMONS P.U.D. SUDIVISION, SECTION FOUR;
THENCE, WITH THE CENTERLINE OF WATSON BRANCH AND THE NORTH LINE OF LOT 808 OF SAID CREEKSTONE COMMONS P.U.D. SUBDIVISION, SECTION FOUR AND THE NORTH LINE OF LOT 27 ON SAID PLAN OF CREEKSTONE COMMONS SUBDIVISION, REVISION 4 THE FOLLOWING SIXTEEN BEARINGS AND DISTANCES:
1. NORTH 83 DEGREES 48 MINUTES 10 SECONDS WEST, 161.22 FEET;
2. SOUTH 61 DEGREES 46 MINUTES 08 SECONDS WEST, 106.65 FEET;
3. SOUTH 86 DEGREES 48 MINUTES 30 SECONDS WEST, 198.12 FEET;
4. NORTH 65 DEGREES 28 MINUTES 52 SECONDS WEST, 120.02 FEET;
5. NORTH 24 DEGREES 43 MINUTES 04 SECONDS WEST, 244.21 FEET;
6. NORTH 84 DEGREES 36 MINUTES 00 SECONDS WEST, 115.35 FEET;
7. NORTH 52 DEGREES 04 MINUTES 01 SECONDS WEST, 87.70 FEET;
8. NORTH 57 DEGREES 18 MINUTES 12 SECONDS WEST, 163.19 FEET;
9. NORTH 29 DEGREES 52 MINUTES 55 SECONDS WEST, 101.80 FEET;
10. NORTH 74 DEGREES 02 MINUTES 09 SECONDS WEST, 41.15 FEET;
11. NORTH 48 DEGREES 56 MINUTES 27 SECONDS WEST, 137.25 FEET;
12. SOUTH 88 DEGREES 57 MINUTES 25 SECONDS WEST, 67.60 FEET,

13. SOUTH 10 DEGREES 32 MINUTES 54 SECONDS WEST, 26.12 FEET,
14. SOUTH 74 DEGREES 19 MINUTES 35 SECONDS WEST, 89.75 FEET,
15. NORTH 75 DEGREES 22 MINUTES 06 SECONDS WEST, 55.08 FEET,
16. NORTH 62 DEGREES 35 MINUTES 03 SECONDS WEST, 10.27 FEET,
THENCE, LEAVING WATSON BRANCH WITH A THE CENTERLINE OF A DRAINAGE DITCH AND SEVERING SAID LOT 24 OF FINAL PLAN OF WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, THE FOLLOWING SEVEN BEARINGS AND DISTANCES:
1. NORTH 39 DEGREES 40 MINUTES 55 SECONDS EAST, 27.30 FEET,
2. SOUTH 89 DEGREES 07 MINUTES 57 SECONDS EAST, 31.47 FEET,
3. NORTH 25 DEGREES 32 MINUTES 12 SECONDS EAST, 70.78 FEET,
4. NORTH 10 DEGREES 00 MINUTES 40 SECONDS WEST, 49.37 FEET,
5. NORTH 54 DEGREES 59 MINUTES 41 SECONDS EAST, 103.02 FEET,
6. NORTH 40 DEGREES 36 MINUTES 36 SECONDS EAST, 74.71 FEET,
7. NORTH 53 DEGREES 28 MINUTES 05 SECONDS EAST, 164.68 FEET TO THE POINT OF BEGINNING AND CONTAINING 754,942 SQUARE FEET OR 17.33 ACRES, MORE OR LESS.

and

LOT 32
MAP 79, PARCEL 101.00

A TRACT OF LAND IN THE NINTH CIVIL DISTRICT OF WILLIAMSON COUNTY, CITY OF FRANKLIN, TENNESSEE, AND BEING LOT 32 AS SHOWN ON THE FINAL PLAT ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2, REVISION 1, RESUBDIVISION OF LOT 31” OF RECORD IN PLAT BOOK P62, PAGE 45, REGISTER'S OFFICE FOR WILLIAMSON COUNTY TENNESSEE (R.O.W.C.T.). AND BEING GENERALLY BOUNDED ON THE NORTH BY LOT 10 AS SHOWN ON PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2” OF RECORD IN PLAT BOOK 13, PAGE 85, R.O.W.C.T., ON THE EAST BY RIVERSIDE DRIVE (IMPROVED AND UNIMPROVED ROAD, RIGHT-OF-WAY WIDTH VARIES), ON THE SOUTH BY OAK MEADOW DRIVE (RIGHT-OF-WAY WITH VARIES), AND ON THE WEST BY LOT 2 AS SHOWN ON THE PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, (RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11) OF RECORD IN PLAT BOOK 29, PAGE 139, R.O.W.C.T. AND LOT 31 ON SAID PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2, REVISION 1, RESUBDIVISION OF LOT 31” OF RECORD IN PLAT BOOK P62, PAGE 45, R.OW.C.T., AND BEING DESCRIBED ACCORDING TO A SURVEY DATED OCTOBER 15, 2015 AND PREPARED BY KEVIN L BIRDWELL, R.L.S. NO. 1797 WHOSE ADDRESS IS RAGAN SMITH ASSOCIATES, 315 WOODLAND STREET, NASHVILLE, TN 37206 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT AN IRON ROD (OLD) WITH CAP STAMPED “RAGAN-SMITH ASSOCIATES” (RSA), SAID PIN BEING IN THE EASTERLY RIGHT-OF-WAY OF SOUTH ROYAL OAKS BOULEVARD AND BEING THE NORTH END OF A CURVE AT THE INTERSECTION OF THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND THE NORTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND BEING A WESTERLY CORNER OF LOT 30 OF THE FINAL PLAT ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2 OF RECORD IN PLAT BOOK P43, PAGE 40, R.O.W.C.T.;
THENCE, WITH A CURVE TO THE LEFT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 73.83 FEET, A CENTRAL ANGLE OF 84 DEGREES 35 MINUTES 53 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 06 DEGREES 29 MINUTES 38 SECONDS EAST, 67.30 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA) IN THE NORTHERLY RIGHT-OF-WAY OF OAK MEADOW DRIVE (RIGHT-OF-WAY WIDTH VARIES);
THENCE, CONTINUING WITH SAID RIGHT-OF-WAY AND WITH THE SOUTHERLY LINE OF SAID LOT 30 THE FOLLOWING TWO CALLS:
1. SOUTH 48 DEGREES 47 MINUTES 29 SECONDS EAST, 157.42 FEET IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 750.00 FEET, AN ARC LENGTH OF 251.97 FEET, A CENTRAL ANGLE OF 19 DEGREES 14 MINUTES 55 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 58 DEGREES 24 MINUTES 57 SECONDS EAST, 250.78 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA) AT THE SOUTHWEST CORNER OF LOT 31 ON THE PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2, REVISON 1, RESUBDIVISION OF LOT 31” OF RECORD IN PLAT BOOK P62, PAGE 45, R.O.W.C.T.;
THENCE, CONTINUING WITH SAID RIGHT-OF-WAY AND WITH THE SOUTHERLY LINE OF SAID LOT 31 THE FOLLOWING THREE CALLS:
1. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 750.00 FEET, AN ARC LENGTH OF 116.20 FEET,

A CENTRAL ANGLE OF 08 DEGREES 52 MINUTES 38 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 72 DEGREES 28 MINUTES 44 SECONDS EAST, 116.09 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. SOUTH 76 DEGREES 55 MINUTES 03 SECONDS EAST, 811.13 FEET TO AN IRON ROD (OLD);
3. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 607.96 FEET, AN ARC LENGTH OF 43.08 FEET, A CENTRAL ANGLE OF 04 DEGREES 03 MINUTES 37 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 74 DEGREES 53 MINUTES 15 SECONDS EAST, 43.07 FEET TO A PK NAIL (OLD) IN THE CENTERLINE OF AN ACCESS DRIVE, THE **POINT OF BEGINNING** OF THE HEREIN DESCRIBED TRACT OF LAND AND PROCEEEDING AS FOLLOWS:
4. THENCE, LEAVING SAID RIGHT-OF-WAY OF OAK MEADOW DRIVE WITH THE CENTERLINE OF SAID ACCESS DRIVE AND THE EAST LINE OF SAID LOT 31 ON THE PLAN ENTITLED "WATSON GLEN SUBDIVISION, SECTION 2, REVISON 1, RESUBDIVISION OF LOT 31" OF RECORD IN PLAT BOOK P62, PAGE 45, R.O.W.C.T.;NORTH 06 DEGREES 14 MINUTES 29 SECONDS EAST, 564.50 FEET TO A PK NAIL (OLD) IN THE SOUTH LINE OF LOT 2 AS SHOWN ON THE PLAN ENTITLED "WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, (RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11);
THENCE, WITH THE SOUTH AND EAST LINE OF SAID LOT 2, THE FOLLOWING TWO BEARINGS AND DISTANCES:
1. SOUTH 83 DEGREES 35 MINUTES 44 SECONDS EAST, 73.68 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. NORTH 06 DEGREES 24 MINUTES 16 SECONDS EAST, 708.89 FEET TO PUNCH HOLE IN A LIGHT BASE IN THE SOUTH LINE OF SAID LOT 10 OF FINAL PLAT ENTITLED "WATSON GLEN SUBDIVISION, SECTION 2";
THENCE, WITH THE SOUTH LINE OF SAID LOT 10, SOUTH 83 DEGREES 32 MINUTES 35 SECONDS EAST, 377.77 FEET TO CONCRETE MONUMENT OLD IN THE WESTERLY RIGHT-OF-WAY OF RIVERSIDE DRIVE (RIGHT-OF-WAY WIDTH VARIES);
THENCE, WITH THE WESTERLY RIGHT-OF-WAY OF RIVERSIDE DRIVE (IMPROVED AND UNIMPROVED ROAD), THE FOLLOWING FOUR CALLS:
1. SOUTH 07 DEGREES 40 MINUTES 29 SECONDS WEST, 577.88 FEET TO AN IRON ROD (OLD);
2. SOUTH 04 DEGREES 01 MINUTES 39 SECONDS WEST, 310.67 FEET TO AN IRON ROD (OLD);
3. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 11300.00 FEET, AN ARC LENGTH OF 470.04 FEET, A CENTRAL ANGLE OF 02 DEGREES 23 MINUTES 00 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 05 DEGREES 13 MINUTES 09 SECONDS WEST, 470.01 FEET TO A CONCRETE MONUMENT (OLD);
4. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 11300.00 FEET, AN ARC LENGTH OF 112.73 FEET, A CENTRAL ANGLE OF 00 DEGREES 34 MINUTES 18 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 06 DEGREES 41 MINUTES 48 SECONDS WEST, 112.73 FEET TO A CONCRETE MONUMENT (OLD);
THENCE, LEAVING SAID RIGHT-OF-WAY OF RIVERSIDE DRIVE AND WITH THE NORTH RIGHT-OF-WAY OF OAK MEADOW DRIVE (RIGHT-OF-WAY WIDTH VARIES) THE FOLLOWING TWO CALLS:
1. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 123.89 FEET, A CENTRAL ANGLE OF 141 DEGREES 58 MINUTES 19 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 77 DEGREES 58 MINUTES 06 SECONDS WEST, 94.54 FEET TO AN IRON ROD (OLD);
2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 607.96 FEET, AN ARC LENGTH OF 443.66 FEET, A CENTRAL ANGLE OF 41 DEGREES 48 MINUTES 42 SECONDS, AND A CHORD BEARING AND DISTANCE OF NORTH 51 DEGREES 57 MINUTES 06 SECONDS WEST, 433.88 FEET TO THE **POINT OF BEGINNING** AND CONTAINING 569,021 SQUARE FEET OR 13.06 ACRES, MORE OR LESS.

SECTION II: That the attached Location Map shall serve the purpose of further delimiting the geographical boundaries as described by this Ordinance.

SECTION III. BE IT FINALLY ORDAINED by the Board of Mayor and Aldermen of the City of Franklin, Tennessee, that this Ordinance shall take effect from and after its passage on third and final reading, the health, safety, and welfare of the citizens requiring it.

ATTEST:

By: _____
Eric Stuckey
City Administrator/Recorder

CITY OF FRANKLIN, TENNESSEE:

By: _____
Dr. Ken Moore
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

PLANNING COMMISSION RECOMMENDED: _____

PASSED FIRST READING: _____

PUBLIC HEARING HELD: _____

PASSED SECOND READING: _____

PASSED THIRD READING: _____

REZONING

The Epoch Development
REZONING SUBMITTAL

Franklin, Williamson County, Tennessee

CITY OF FRANKLIN PROJECT NO. 6085

JUNE 2 2016

SITE DATA

PROJECT NAME	THE EPOCH DEVELOPMENT REZONING & PUD APPLICATION
PROJECT NUMBER:	6086
LOTS:	2 EXISTING, 5 PROPOSED
ADDRESS:	840 & 880 OAK MEADOWS DR.
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH
MAP, GROUP AND PARCEL NUMBERS:	MAP 79, PARCELS 88.00 (PORTION OF) & 101.19
EXISTING ZONING:	GC (GENERAL COMMERCIAL)
PROPOSED ZONING:	SD-R (10) (SPECIFIC DEVELOPMENT RESIDENTIAL 10 UNITS/AC.)
CHARACTER AREA OVERLAY:	MECO-5
OTHER APPLICABLE OVERLAYS:	FFO & FWO
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	13.06 + 17.33 = 30.39 ACRES
SQUARE FOOTAGE OF SITE:	569,021 + 754,942 = 1,323,963 SQUARE FEET
MINIMUM REQUIRED SETBACK LINES:	ATTACHED RESIDENTIAL USE
YARD FRONTING COLLECTOR (OAK MEADOWS)	40'
SIDE YARD	15'
REAR YARD	30'
OWNER (BOTH PARCELS):	E. WARNER BASS, TRUSTEE
ADDRESS:	150 3RD AVE. SOUTH, SUITE 2800, NASHVILLE, TN 37201
PHONE NO.:	615.742.6400
E-MAIL ADDRESS:	wbass@bassberry.com
CONTACT NAME:	MR. WARNER BASS
MINERAL RIGHTS:	CONTROLLED BY CURRENT PROPERTY OWNER
APPLICANT:	CRUNK ENGINEERING LLC
ADDRESS:	1894 GEN. GEORGE PATTON DR., SUITE 600 FRANKLIN, TN 37067
PHONE NO.:	615.873.1795
E-MAIL ADDRESS:	adam@crunkeng.com
CONTACT NAME:	MR. ADAM CRUNK, P.E.
DENSITY	
ATTACHED DWELLING UNITS	302 UNITS
LAND AREA	30.39 ACRES
LAND AREA WITHIN FLOODPLAIN OVERLAY	8.32 ACRES
OVERALL DENSITY	9.9 UNITS/ACRE
NET DENSITY (MINUS OVERLAY CONSTRAINT)	13.7 UNITS/ACRE
BUILDING HEIGHT	
ALLOWABLE	6 STORIES MAXIMUM
PROPOSED	NORTH PARCEL - 4 STORIES SOUTH PARCEL 2/3 STORIES (2 STORY FACING STREET)
PROPOSED LANDSCAPE SURFACE RATIO:	NORTH SITE - 0.53; SOUTH SITE - 0.76; COMBINED - 0.66
MINIMUM LANDSCAPE SURFACE RATIO:	0.20

PARKING

EXISTING 0

REQUIRED (1.5/1BR + 2.5/2BR + 3/3BR)

NORTH SITE		SOUTH SITE	
1BR - 72 UNITS * 1.5 =	108 SPACES	1BR - 28 UNITS * 1.5 =	42 SPACES
2BR - 116 UNITS * 2.5 =	290 SPACES	2BR - 50 UNITS * 2.5 =	125 SPACES
3BR - 16 UNITS * 3.0 =	48 SPACES	3BR - 20 UNITS * 3.0 =	60 SPACES
TOTAL REQUIRED =	446 SPACES	TOTAL REQUIRED =	227 SPACES
INCLUDING 9 ADA SPACES		INCLUDING 7 ADA SPACES	

MAXIMUM PARKING: NORTH SITE - 536 SPACES; SOUTH SITE - 273 SPACES

PROPOSED

NORTH SITE		SOUTH SITE	
REGULAR SPACES	430	REGULAR SPACES	186
COMPACT SPACE (0 % OF TOTAL)	0	COMPACT SPACES (14 % OF TOTAL)	31
ADA SPACES	16	ADA SPACES	10
TOTAL PROVIDED	446	TOTAL PROVIDED	227

TREE CANOPY:

SITE HAS BEEN WALKED WITH LARRY MIZZELL TO IDENTIFY TREES TO BE REMOVED. TREE CANOPY REQUIREMENTS WILL BE ADDRESSED AT SITE PLAN REVIEW TO COMPLY WITH ZONING ORDINANCE.

PARKLAND DEDICATION: FEE IN LIEU OF FOR 4.64 ACRES, 302 TOTAL UNITS PROPOSED

OPEN SPACE:

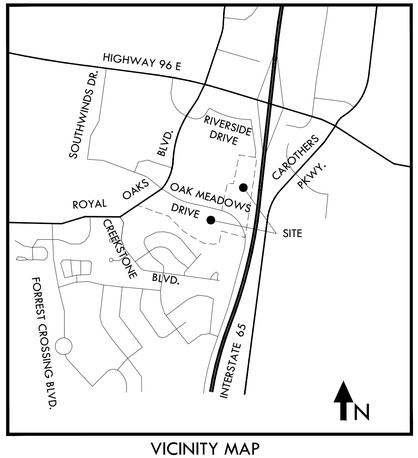
TOTAL OPEN SPACE REQ'D (15% OF 30.39 AC.)	4.56 AC.
FORMAL OPEN SPACE REQUIRED (33% OF OPEN SPACE REQUIRED)	1.52 AC.
	2.4 AC. PROVIDED
INFORMAL OPEN SPACE REQUIRED (67% OF OPEN SPACE REQUIRED)	3.04 AC.
	8.0 AC. PROVIDED

USE BUFFER: 50-FT CLASS C INCOMPATIBLE LAND USE BUFFER (SOUTH PORTION OF SOUTH SITE)
40-FT INTERSTATE BUFFER (EAST PORTION OF NORTH SITE)

NOTES:

PROPERTY IS LOCATED ON MAP 79 AS A PORTION OF LOT 88.00 AND PARCEL 101.19 CONTAINING 30.39 ACRES.

PARCEL 88.00 DOES LIE WITHIN THE 100-YEAR FLOOD PLAIN AS INDICATED BY FIRM MAP NO. 47187C0212F DATED SEPTEMBER 29, 2006.



VICINITY MAP
NO SCALE

PREPARED FOR:

EPOCH RESIDENTIAL

359 Carolina Avenue

Winter Park, Florida

(407) 644-9055

STATEMENT OF IMPACT - POLICE, FIRE, SOLID WASTE, PARKS:
The proposed project will add 302 multi-family units. The property is currently undeveloped within the existing City Limits of the City of Franklin. Therefore, no new land is being developed outside the existing jurisdiction of City of Franklin Police, Fire, or Solid Waste services.

The project is approximately a 4 mile driving distance from the Police Station; 1.5 mile driving distance from the nearest fire station on Murfreesboro Rd.
The project will have two dumpster locations for solid waste. One serving 204 units and the other serving 98 units.
No new parkland is being dedicated as part of this project. However, this project will contribute to parkland funds.

STATEMENT OF IMPACT - STORMWATER:

The proposed development contains two site features that will be protected during construction. The south site contains a wetland area as well as a stream, Watson Branch. the site has been designed not to impact these site features. The required buffers for each feature have been shown on these plans.

STATEMENT OF IMPACT - TRANSPORTATION:
The proposed project will add 302 multi-family units with access along Oak Meadow Drive and Riverside Drive. The primary road corridor serving the project is the major arterial South Royal Oaks Boulevard. Based on the traffic study performed for this project, the majority of traffic will be directed in the northernly direction toward Cool Springs.

STATEMENT OF IMPACTS - WATER AND SEWER:
The proposed project is the construction of 302 new attached dwelling units with a mixture of one, two, and three bedroom units. The project will result in a projected flow of 87,400 GPD. The Northern site will be served by water off of the existing 10" main in the old Riverside Drive ROW, and sewer at the existing manhole behind the Home Depot. The Southern site will be served by water with a new 8" main along Oak Meadow Dr. that will connect from Royal Oaks Blvd. and tie into the 10" main along the old Riverside Drive ROW, and sewer will be served by the existing 24" main that runs along Watson Branch on the subject property. Reclaimed water is not located in the project vicinity.

SHEET NO.	SHEET TITLE
C0.0	COVER SHEET
C1.0	OVERALL EXISTING CONDITIONS
C1.1	NORTH SITE EXISTING CONDITIONS
C1.2	SOUTH SITE EXISTING CONDITIONS

CRUNK ENGINEERING LLC
1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

ENGINEERING CRUNK

WILSON CAIN — REGISTERED — AGRICULTURE — COMMERCE — No. 114180 — STATE OF TENNESSEE — 6/2/16

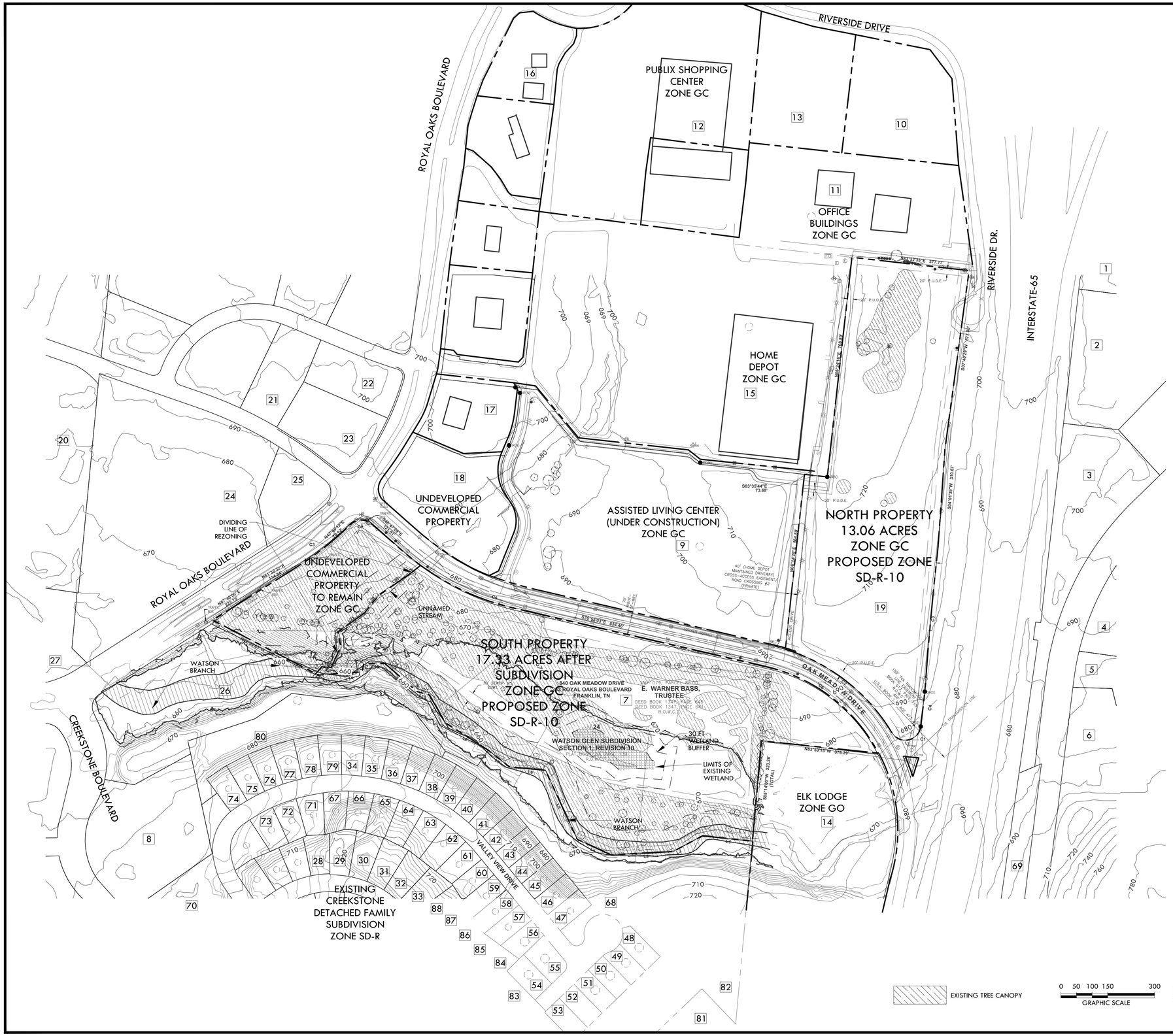
THE EPOCH DEVELOPMENT
REZONING SUBMITTAL
COF #6085 FRANKLIN, TN

REVISIONS		
No.	DATE	

06/02/16 15001

C0.0

COVER SHEET



ID	PRCUID	DEED / PLAT	LAND USE	OWNER	ZONING
1	079---06905	DB 3844 DP 619 PB116 PP114	HOTEL	BRE/LQ PROP LLC	GC
2	079---06906	DB 2906 DP 435 PB22 PP11	AUTO DLR	ADKINS RODNEY G	GC
3	079---07600	DB 4341 DP763 PB22 PP11	CHURCH	CHURCH GATE THE	GC
4	079---08000	DB6337 DP70 PB61 PP69	REC	SOAR ADVENTURE TOWER LLC	GC
5	079---08200	DB5165 DP555	UNDEV.	NICHOLS J DONALD	SD-R
6	079---08300	DB1350 DP525	ATTACHED RESID.	UNITED DOMINION REALTY LP	GC
7	079---08800	DB1347 DP645 PB29 PP139	UNDEV.	BASS E WARNER TR	GC
8	079---10001	DB2192 DP320 PB31 PP125	DAYCARE	WOOD & WOOD LLC	GO
9	079---10100	DB6533 DP243 PB62 PP45	ASST. LVG	DOMINION SENIOR LIVING OF FRANKLIN L	GC
10	079---10101	DB5434 DP690	OFFICE	5107 LLC	GC
11	079---10102	DB2200 DP199 PB19 PP59	OFFICE	LIN DON REALTY LLC	GC
12	079---10103	DB5459 DP859 PB59 PP3	RETAIL	PUBLIX TENNESSEE LLC	GC
13	079---10104	DB6168 DP806 PB22 PP120	ASST. LVG	FRANKLIN TN SENIOR CARE PROPERTY LLC	GC
14	079---10105		REC	NASHVILLE LODGE #72 BPO ELKS	GO
15	079---10110	DB4406 DP792 PB29 PP138	RETAIL	HD DEVELOPMENT OF MARYLAND INC	GC
16	079---10114	DB5459 DP859 PB29 PP139	RETAIL	PUBLIX TENNESSEE LLC	GC
17	079---10116	DB1792 DP29 PB29 PP139	RETAIL	FIRST-CITIZENS BANK AND TR CO	GC
18	079---10117	PB 43 PP40	UNDEV.	BASS E WARNER TR	GC
19	079---10119	PB 43 PP40	UNDEV.	BASS E WARNER TR	GC
20	079I-A01401	DB4197 DP993 PB41 PP33	UNDEV.	SWJ2 TENNESSEE LLC	RM-20
21	079O-A00300	DB4200 DP849 PB27 PP4	INSTIT.	CHURCH CORNERSTONE-MINISTRIES INC	GC
22	079O-A00301	DB5790 DP107 PB29 PP10	RETAIL	MAGLI CHERYL S FAMILY TRUST	GC
23	079O-A00302	DB5871 DP528 PB26 PP10	RETAIL	LCJ LLC	GC
24	079O-A00400	DB794 DP881 PB12 PP76		UNITED STATES POSTAL SERV	CI
25	079O-A00401	DB1946 DP286 PB12 PP76	RETAIL	COMMUNITY BANK	GC
26	079O-G02500	DB5136 DP628	UNDEV.	CADENCE BANK NA	GO
27	079O-O02800	PB47 PP142	UNDEV.	ROYAL OAKS PARK SOUTH	GO
28	079O-D00100	DB5814 DP815 PB55 PP146	RESIDENTIAL	THURM DAVID M	SD-R
29	079O-D00200	DB5807 DP985 PB55 PP146	RESIDENTIAL	HAMILTON MALLORY	SD-R
30	079O-D00300	DB6624 DP480 PB55 PP146	RESIDENTIAL	LYLE JORDAN WILLIAM	SD-R
31	079O-D00400	DB5780 DP386 PB55 PP146	RESIDENTIAL	EVANGELISTA BERNARDINO JR	SD-R
32	079O-D00500	DB5841 DP984 PB55 PP146	RESIDENTIAL	CASTANEDA ORESTES	SD-R
33	079O-D00600	DB5809 DP135 PB55 PP146	RESIDENTIAL	VOSS STEPHEN M	SD-R
34	079O-E00100	DB6336 DP118 PB58 PP10	RESIDENTIAL	KHOT SOHAM	SD-R
35	079O-E00200	DB6190 DP252 PB58 PP10	RESIDENTIAL	GOOCH RYAN M	SD-R
36	079O-E00300	DB6218 DP405 PB58 PP10	RESIDENTIAL	SULLIVAN JOHN	SD-R
37	079O-E00400	DB6232 DP972 PB58 PP10	RESIDENTIAL	CULLEN ROBERT BARRY	SD-R
38	079O-E00500	DB6231 DP1 PB58 PP10	RESIDENTIAL	MILLER ROBERT FRANK	SD-R
39	079O-E00600	DB6288 DP734 PB58 PP10	RESIDENTIAL	DHARANI KHAIRUNISSA	SD-R
40	079O-E00700	DB6218 DP407 PB58 PP10	RESIDENTIAL	KNOX CONSUELIA S	SD-R
41	079O-E00800	DB6229 DP797 PB58 PP10	RESIDENTIAL	DAWKINS BRETTON GUY	SD-R
42	079O-E00900	DB6296 DP854 PB58 PP10	RESIDENTIAL	COMEAUX MARGARET A	SD-R
43	079O-E01000	DB6273 DP312 PB58 PP10	RESIDENTIAL	SMITH CHRISTOPHER S	SD-R
44	079O-E01100	DB6281 DP281 PB58 PP10	RESIDENTIAL	DANIELS THOMAS	SD-R
45	079O-E01200	DB6341 DP640 PB58 PP10	RESIDENTIAL	SUNDARAM BARATH SHANMUGA	SD-R
46	079O-E01300	DB6331 DP190 PB58 PP10	RESIDENTIAL	HOSSAIN MOHAMMAD	SD-R
47	079O-E01400	DB6264 DP154 PB58 PP10	RESIDENTIAL	MAPLESDEN LAWRENCE	SD-R
48	079O-E01500	DB6346 DP779 PB58 PP10	RESIDENTIAL	BECHARD BRIAN	SD-R
49	079O-E01600	DB6329 DP817 PB58 PP10	RESIDENTIAL	VIDYAM SATHEESH	SD-R
50	079O-E01700	DB6146 DP158 PB58 PP10	RESIDENTIAL	RUSSO JOHN M	SD-R
51	079O-E01800	DB6177 DP164 PB58 PP10	RESIDENTIAL	OLIGLEY J PATRICK	SD-R
52	079O-E01900	DB6151 DP238 PB58 PP10	RESIDENTIAL	BONHAM SYDNEY	SD-R
53	079O-E02000	DB6156 DP254 PB58 PP10	RESIDENTIAL	BURGER JORDAN	SD-R
54	079O-E02100	DB6172 DP871 PB58 PP10	RESIDENTIAL	NOLAN MICHAEL S TRUST	SD-R
55	079O-E02200	DB6195 DP626 PB58 PP10	RESIDENTIAL	PARSI SREEKANTH	SD-R
56	079O-E02300	DB6329 DP771 PB58 PP10	RESIDENTIAL	KOLLI MURALL KRISHNA	SD-R
57	079O-E02400	DB6252 DP619 PB58 PP10	RESIDENTIAL	KAMAN VENKATESH	SD-R
58	079O-E02500	DB6231 DP816 PB58 PP10	RESIDENTIAL	RAJENDRAN THAMIL S	SD-R
59	079O-E02600	DB6195 DP601 PB58 PP10	RESIDENTIAL	DOPPALAPUDI SRIKANTH	SD-R
60	079O-E02700	DB6182 DP362 PB58 PP10	RESIDENTIAL	CHINTAKINDI VARUN K	SD-R
61	079O-E02800	DB6177 DP138 PB58 PP10	RESIDENTIAL	KRISHNAN JAGADEESWARAN	SD-R
62	079O-E02900	DB6152 DP63 PB58 PP10	RESIDENTIAL	MOHAMED ABDUL R J	SD-R
63	079O-E03000	DB6153 DP125 PB58 PP10	RESIDENTIAL	PICHAIMUTHU NARAYANAN	SD-R
64	079O-E03100	DB6100 DP536 PB58 PP10	RESIDENTIAL	ZELLER JAMES S JR	SD-R
65	079O-E03200	DB6583 DP472 PB58 PP10	RESIDENTIAL	MURRAY KIMBERLY	SD-R
66	079O-E03300	DB6172 DP802 PB58 PP10	RESIDENTIAL	ZIPPER NATHAN M	SD-R
67	079O-E03400	DB6154 DP157 PB58 PP10	RESIDENTIAL	VIGIL MARIO G	SD-R
68	079O-E03500	DB6104 DP222 PB58 PP10	RESIDENTIAL	CREEKSTONES HOMEOWNERS ASSOCIATION I	SD-R
69	089---02609	DB3915 DP 891 PB14 PP17	RESIDENTIAL	A T & T CORP BY & THROUGH	R-2
70	089B-004200	DB5309 DP243 PB54 PP20	RESIDENTIAL	CREEKSTONE HOMEOWNERS ASSOCIATION IN	SD-R
71	089B-004600	DB5727 DP67 PB54 PP20	RESIDENTIAL	BLACKSHER NICOLE E	SD-R
72	089B-004700	DB6656 DP836 PB54 PP20	RESIDENTIAL	DRUSE JONATHAN	SD-R
73	089B-004800	DB5674 DP620 PB54 PP20	RESIDENTIAL	KUMAR RATNA	SD-R
74	089B-005000	DB6412 DP384 PB54 PP20	RESIDENTIAL	BLANKENSHIP JON I	SD-R
75	089B-005100	DB5710 DP738 PB54 PP20	RESIDENTIAL	BURRELL GERALD MARK	SD-R
76	089B-005200	DB5716 DP104 PB54 PP20	RESIDENTIAL	BUCKNER RICHARD D	SD-R
77	089B-005300	DB5604 DP513 PB54 PP20	RESIDENTIAL	LERCHE MICHAEL	SD-R
78	089B-005400	DB6046 DP929 PB54 PP20	RESIDENTIAL	RUSSELL KAREN KINGSBURY	SD-R
79	089B-005500	DB5747 DP463 PB54 PP20	RESIDENTIAL	THEURER DAVID S	SD-R
80	089B-005600	DB5309 DP243 PB54 PP20	RESIDENTIAL	CREEKSTONE HOMEOWNERS ASSOCIATION IN	SD-R
81	089B-P01500	DB6057 DP780 PB56 PP76	RESIDENTIAL	BARLOW JOHN	SD-R
82	089B-P01600	DB6119 DP185 PB56 PP76	RESIDENTIAL	ERWIN DEVAN A	SD-R
83	089B-P02000	DB6031 DP735 PB56 PP76	RESIDENTIAL	PATEL NIKUNJ M	SD-R
84	089B-P02100	DB5983 DP439 PB56 PP76	RESIDENTIAL	JANI BHAVESHKUMAR	SD-R
85	089B-P02200	DB5989 DP962 PB56 PP76	RESIDENTIAL	HARRIS JOHN	SD-R
86	089B-P02300	DB6003 DP115 PB56 PP76	RESIDENTIAL	LEDGISTER KEVIN ARTHUR	SD-R
87	089B-P02400	DB6377 DP104 PB56 PP76	RESIDENTIAL	JOHANSEN MICHAEL	SD-R
88	089B-P02500	DB5899 DP690 PB56 PP76	RESIDENTIAL	COLLIER EDWARD W III	SD-R

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WILSON COUNTY TENNESSEE AGRICULTURE COMMERCE 1 1 4 1 8 0 STATE OF TENNESSEE 6/2

THE EPOCH DEVELOPMENT

REZONING SUBMITTAL

COF #6085 FRANKLIN, TN

REVISIONS	
No.	DATE

06/02/16 15001

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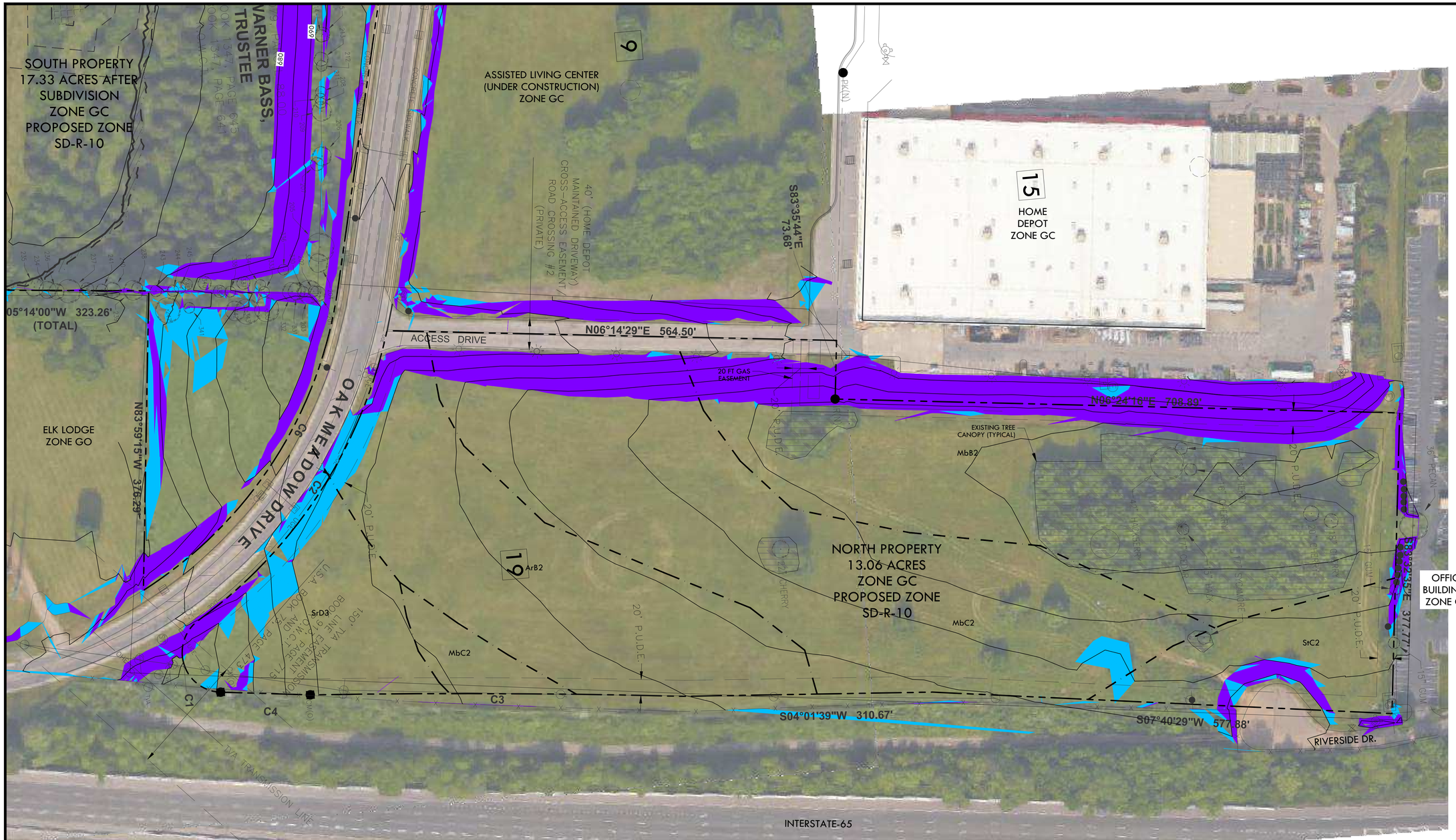
OVERALL EXISTING CONDITIONS PLAN



SLOPE LEGEND

- GREATER THAN 14% AND LESS THAN 20% SLOPE
- GREATER THAN 20% SLOPE

SOIL TYPES

ArB2	Armour silt loam, 2% to 5 % slopes, eroded
CaC2	Captina silt loam, phosphatic, 5% to 12% slopes, eroded
Eg	Egam silt loam, phosphatic
Hu	Huntington silt loam, phosphatic
InE3	Inman silty clay loam, 20% to 30% slopes, severely eroded
MbB2	Maury silt loam, 2% to 5% slopes, eroded
MbC2	Maury silt loam, 5% to 12% slopes, eroded
SrC3	Stiversville clay loam, 5% to 12% slopes, eroded
SrD3	Stiversville clay loam, 12% to 20% slopes, severely eroded
StC2	Stiversville silt loam, 5% to 12% slopes, eroded

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	50.00'	123.89'	141°58'19"	145.10	94.54'	S77°58'06"W
C2	607.96'	443.66'	41°48'42"	232.23	433.88'	N51°57'06"W
C3	11300.00'	470.04'	2°23'00"	235.06	470.01'	S05°13'09"W
C4	11300.00'	112.73'	0°34'18"	56.37	112.73'	S06°41'48"W

0 30 60 120
GRAPHIC SCALE

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TODD WILSON CALDWELL
REGISTERED LANDSCAPE ARCHITECT
No. 114180
STATE OF TENNESSEE
6/2/16

THE EPOCH DEVELOPMENT

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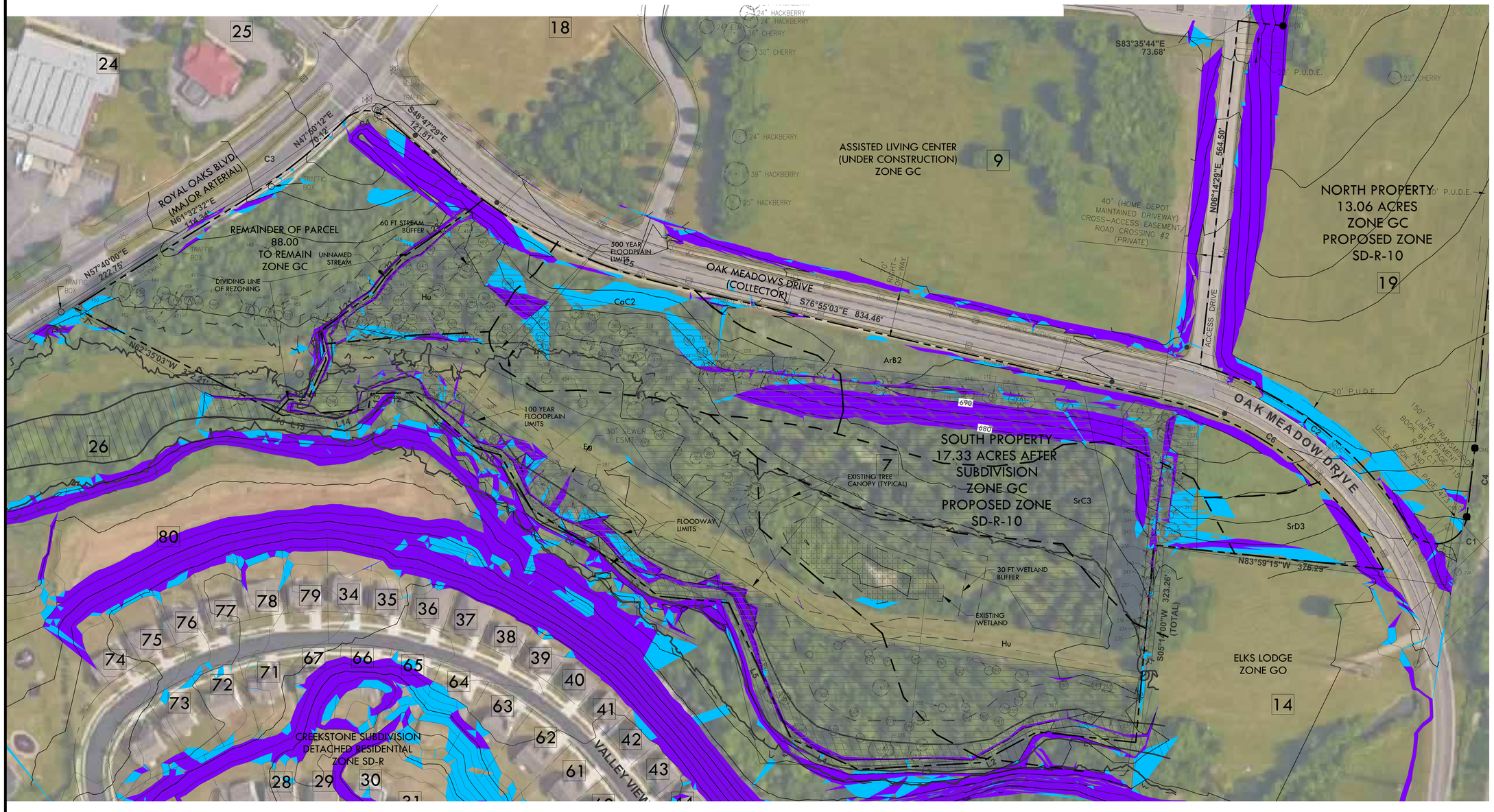
NORTH SITE EXISTING CONDITIONS PLAN



SLOPE LEGEND

- GREATER THAN 14% AND LESS THAN 20% SLOPE
- GREATER THAN 20% SLOPE

SOIL TYPES

ArB2	Armour silt loam, 2% to 5 % slopes, eroded
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SrC3	Stiversville clay loam, 5% to 12% slopes, eroded
SrD3	Stiversville clay loam, 12% to 20% slopes, severely eroded
StC2	Stiversville silt loam, 5% to 12% slopes, eroded

0 40 80 160
GRAPHIC SCALE

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WILSON CARL CRAWFORD JR. REGISTERED LANDSCAPE ARCHITECT AGRICULTURE 6/2/16 COMMERCE No. 114180 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

REZONING SUBMITTAL

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SOUTH SITE EXISTING CONDITIONS PLAN

F i s c h b a c h
Transportation Group, LLC
Traffic Engineering and Planning

Traffic Impact Study

Epoch Apartments
Oak Meadow Drive
Franklin, TN

Prepared May 2016
(Originally Prepared April 2016)
For Epoch Residential

FTG, LLC
P.O. Box 682736
Franklin, TN 37068
(615) 771-8022 phone
Gillian@FTGtraffic.com

Traffic Impact Study

Epoch Apartments
Oak Meadow Drive

Franklin, Tennessee

Prepared May 2016
(Originally Prepared April 2016)

PREPARED FOR:
Epoch Residential
359 Carolina Avenue
Winter Park, FL 32789

PREPARED BY:
Ms. Gillian L. Fischbach, P.E., PTOE
Fischbach Transportation Group (FTG, LLC)
P.O. Box 682736
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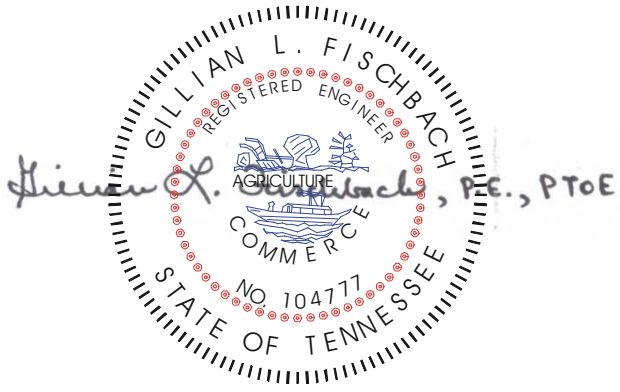
Phone: (615) 771-8022
FTG Project Number: 10728



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1. INTRODUCTION

This traffic study has been prepared in order to identify the traffic impacts of a multi-family residential development that is proposed to be constructed on the north and south sides of Oak Meadow Drive, east of S. Royal Oaks Boulevard, in Franklin, Tennessee.

For the purposes of this study, existing and background traffic volumes were established, and capacity analyses were conducted for these conditions. Also, trip generation calculations were performed, and the trips which are expected to be generated by the proposed project were distributed to the roadway system and added to the background traffic volumes. The roadways and intersections which provide access to the site were then re-evaluated to determine the traffic impacts of the proposed project. Access needs for the project were evaluated, and the necessary roadway and/or traffic control improvements were identified. This report presents the results of these analyses and the subsequent recommendations.

It is important to note that the scope of this Traffic Impact Study was provided by the City of Franklin Engineering Department and their third-party private consultant, Neel-Schaffer, Inc. The approved scope is included in in Appendix A.

2. PROJECT DESCRIPTION

The location of the proposed project is shown in Figure 1. As shown, the project site is located on the north and south sides of Oak Meadow Drive, east of S. Royal Oaks Boulevard, in Franklin, Tennessee. The current project site plan is shown in Figures 2A and 2B. As shown, the proposed plan includes 98 apartments on the south side of Oak Meadow Drive and 204 apartments on the north side of Oak Meadow Drive.

Access for the southern portion of the site will be provided at two locations on Oak Meadow Drive, and access for the northern portion of the site will be provided at one location on the eastern access for the Home Depot shopping center on the north side of Oak Meadow Drive. Also, secondary access for the northern portion of the site will be provided at the existing terminus of Riverside Drive.

Also, it is possible that, in the future, a commercial site will be developed in the southeast quadrant of the intersection of S. Royal Oaks Boulevard and Oak Meadow Drive. For the purposes of this study, it was assumed that 15,000 sq.ft. of specialty retail space will be constructed on this site as shown in Figure 2C. Also, for the purposes of this study, it was assumed that sole access for the future commercial site will be provided on Oak Meadow Drive at the western access proposed for the apartments.

In large part, economic and market considerations will dictate the pace and timing with which the proposed project is actually completed. The analyses conducted within this study are based on the estimation that the entire project will be completed within two years.

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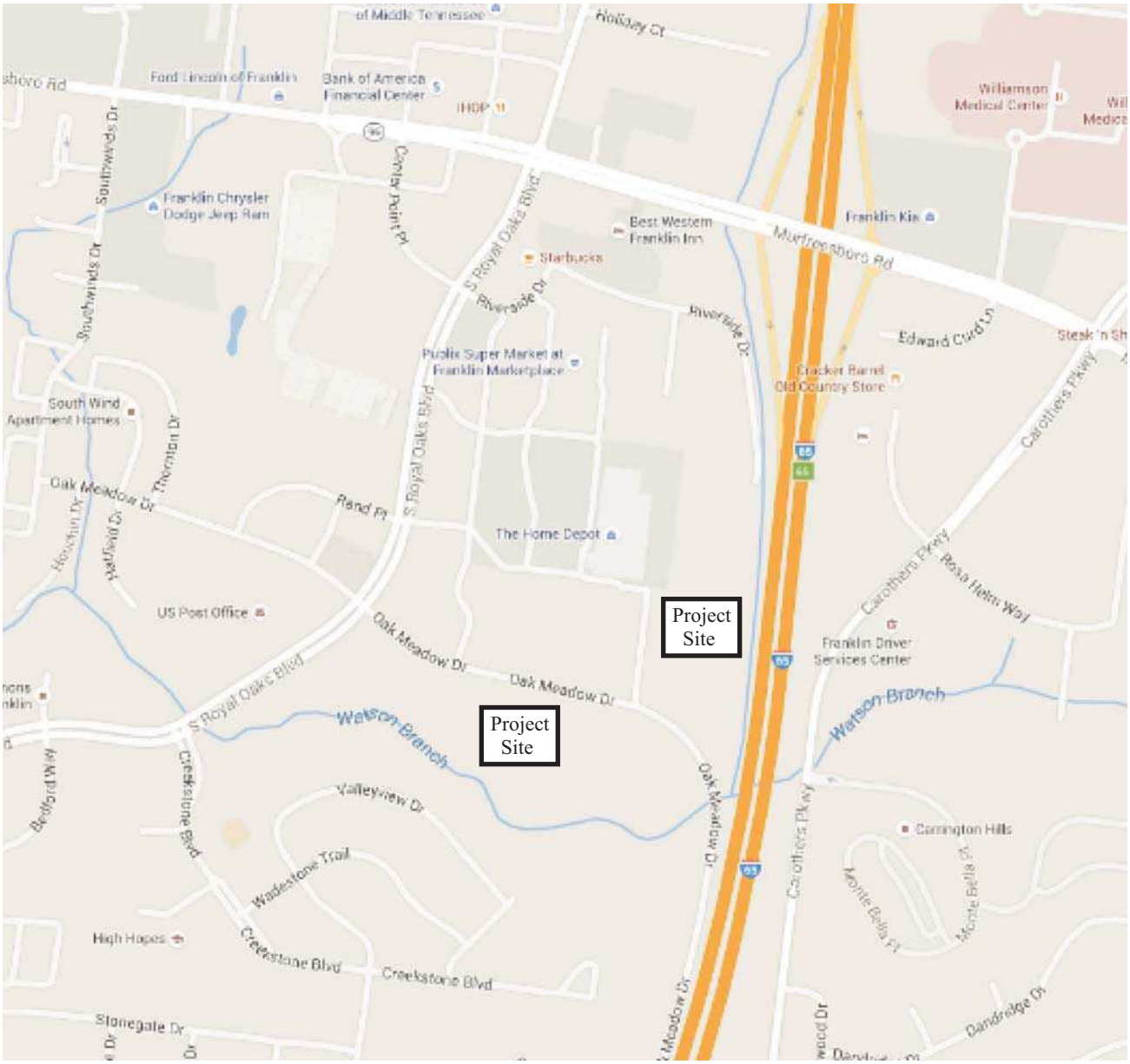
Traffic Engineering and Planning



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No Scale

Figure 1.
Location of the Project Site

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N83°48'10"W	161.22'
L2	S61°46'08"W	106.65'
L3	S86°48'30"W	198.12'
L4	N65°28'52"W	120.02'
L5	N24°43'04"W	244.21'
L6	N84°36'00"W	115.35'
L7	N52°04'01"W	87.70'
L8	N57°18'12"W	163.19'
L9	N29°52'55"W	101.80'
L10	N74°02'09"W	41.15'
L11	N48°56'27"W	137.25'
L12	S88°57'25"W	67.60'
L13	S10°32'54"W	26.12'

LINE TABLE		
LINE	BEARING	DISTANCE
L14	S74°19'35"W	89.75'
L15	N75°22'06"W	55.08'
L16	N62°35'03"W	10.27'
L17	N39°40'55"E	27.30'
L18	S89°07'57"E	31.47'
L19	N25°32'12"E	70.78'
L20	N10°00'40"W	49.37'
L21	N54°59'41"E	103.02'
L22	N40°36'36"E	74.71'
L23	N53°28'05"E	164.68'

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C5	820.00'	330.94'	23°07'24"	167.75	328.69'	S65°21'21"E
C6	537.96'	464.57'	49°28'46"	247.89	450.27'	S52°10'40"E

TOTAL OF 98 UNITS ON SOUTH PARCEL

0 40 80 160
GRAPHIC SCALE

N

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ENGINEERING CRUNK

WILSON COUNTY TENNESSEE AGRICULTURE
JAMES C. No. 114180 STATE OF TENNESSEE
5/9/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

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SOUTH SITE DEVELOPMENT PLAN

SOUTH PROPERTY
17.33 ACRES AFTER
SUBDIVISION
98 UNITS

ASSISTED LIVING CENTER
(UNDER CONSTRUCTION)
ZONE GC

HOME
DEPOT
ZONE GC

ELK LODGE
ZONE GO

40 FT FRONT SETBACK

EXISTING 20' PUDE

52 UNITS
4 STORY

44 UNITS
4 STORY

44 UNITS
4 STORY

60 UNITS
4 STORY

2 UNITS
2 STORY

2 UNITS
2 STORY

TRASH
COMPACTOR AND
ENCLOSURE

MAINTENANCE
BUILDING

OFFICE
BUILDINGS
ZONE GC

EXISTING 20' PUDE

40 FT FRONT SETBACK

STORMWATER
DETENTION/TREATMENT
AREA

40 FT INTERSTATE
BUFFER

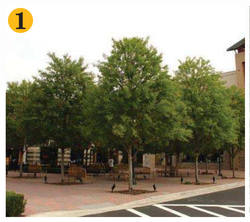
EXISTING TVA
EASEMENT

NORTH PROPERTY
13.06 ACRES
204 UNITS

EXISTING 20' PUDE

RIVERSIDE DR.

INTERSTATE-65



TOTAL OF 204 UNITS ON NORTH PARCEL

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	50.00'	123.89'	141°58'19"	145.10	94.54'	S77°58'06"W
C2	607.96'	443.66'	41°48'42"	232.23	433.88'	N51°57'06"W
C3	11300.00'	470.04'	2°23'00"	235.06	470.01'	S05°13'09"W
C4	11300.00'	112.73'	0°34'18"	56.37	112.73'	S06°41'48"W

0 30 60 120
GRAPHIC SCALE

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LANDSCAPE
ARCHITECT
AGRICULTURE
COMMERCE
No. 114180
STATE OF TENNESSEE
5/9/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

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NORTH SITE
DEVELOPMENT
PLAN

SITE DATA TABLE

15,000 SQ-FT RETAIL SPACE
REQUIRED PARKING (3 SPACES PER 1,000 SQ-FT) = 45
PROVIDED PARKING = 55 SPACES
PROPOSED PROPERTY AREA = 3.5± ACRES

S. ROYAL OAKS BLVD

OAK MEADOWS DR.

BUILDING SETBACK

434.01

98.80

220.09

We understand this connection may not be possible, which is why we are proposing access into the Epoch Development site.

New Left Turn Lane

Existing driveway serving Post Office

Full access intersection proposed

60.0 FT

15,000 SQ-FT
RETAIL BUILDING

DETENTION
AREA

DUMPSTER

RETAINING WALL

60-FT STREAM BUFFER

EXISTING STREAM

PROPOSED
PROPERTY LINE

Epoch Development Site

100-YR FLOOD PLAIN

WATSON BRANCH

0 10 20 30 60
GRAPHIC SCALE

N

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PROPOSED RETAIL SITE
AT
ROYAL OAKS & OAK MEADOWS DRIVE
FRANKLIN, TN

REVISIONS

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SCHEMATIC
SITE PLAN
OVERALL

3. EXISTING TRAFFIC VOLUMES

In order to quantify the impact of the traffic that will be generated by the proposed project, peak hour traffic volumes were counted at the following locations:

1. Oak Meadow Drive and the project accesses
2. S. Royal Oaks Boulevard and Oak Meadow Drive
3. S. Royal Oaks Boulevard and Rand Place / Access for Home Depot
4. S. Royal Oaks Boulevard and Riverside Drive / Center Point Place

Also, the City of Franklin requested that peak hour traffic counts be collected for signal timing purposes at the following intersections:

5. Murfreesboro Road and Royal Oaks Boulevard
6. Murfreesboro Road and the Ramps for Southbound I-65
7. Murfreesboro Road and the Ramps for Northbound I-65

This data was collected during the morning and afternoon peak hours on typical weekdays in February 2016 when schools were in session. The raw traffic volumes are included in Appendix B. The existing laneage at the intersections within the study area is shown in Figure 3, and the existing peak hour traffic volumes are shown in Figure 4.

Using the existing peak hour traffic volumes shown in Figure 4, capacity analyses were conducted for the intersections counted. Specifically, in order to identify current peak hour levels of operation within the study area, the capacity calculations were performed according to the methods outlined in the Highway Capacity Manual 2010 (HCM2010). These analyses result in the determination of a Level of Service (LOS), which is a measure of evaluation is used to describe how well an intersection or roadway operates. LOS A represents free flow traffic operations, and LOS F suggests that the traffic demand exceeds the available capacity. In an urbanized area, LOS D is typically considered to be the minimum acceptable LOS. Table 1 presents the descriptions of LOS for signalized intersections, and Table 2 presents the descriptions of LOS for unsignalized intersections.

It is important to note that the City of Franklin Engineering Department provided the Synchro software files that were used to identify existing operations at the signalized intersections within the study area. Specifically, the files were updated to include the February 2016 traffic volumes. Also, the files were updated to reflect the recently-approved City ordinance that prohibits right-turns-on-red for the northbound right turns on S. Royal Oaks Boulevard at Murfreesboro Road.

The results of the capacity analyses for the existing peak hour traffic volumes are shown in Table 3, and Appendix C includes the capacity analyses worksheets.

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Transportation Group, LLC
Traffic Engineering and Planning

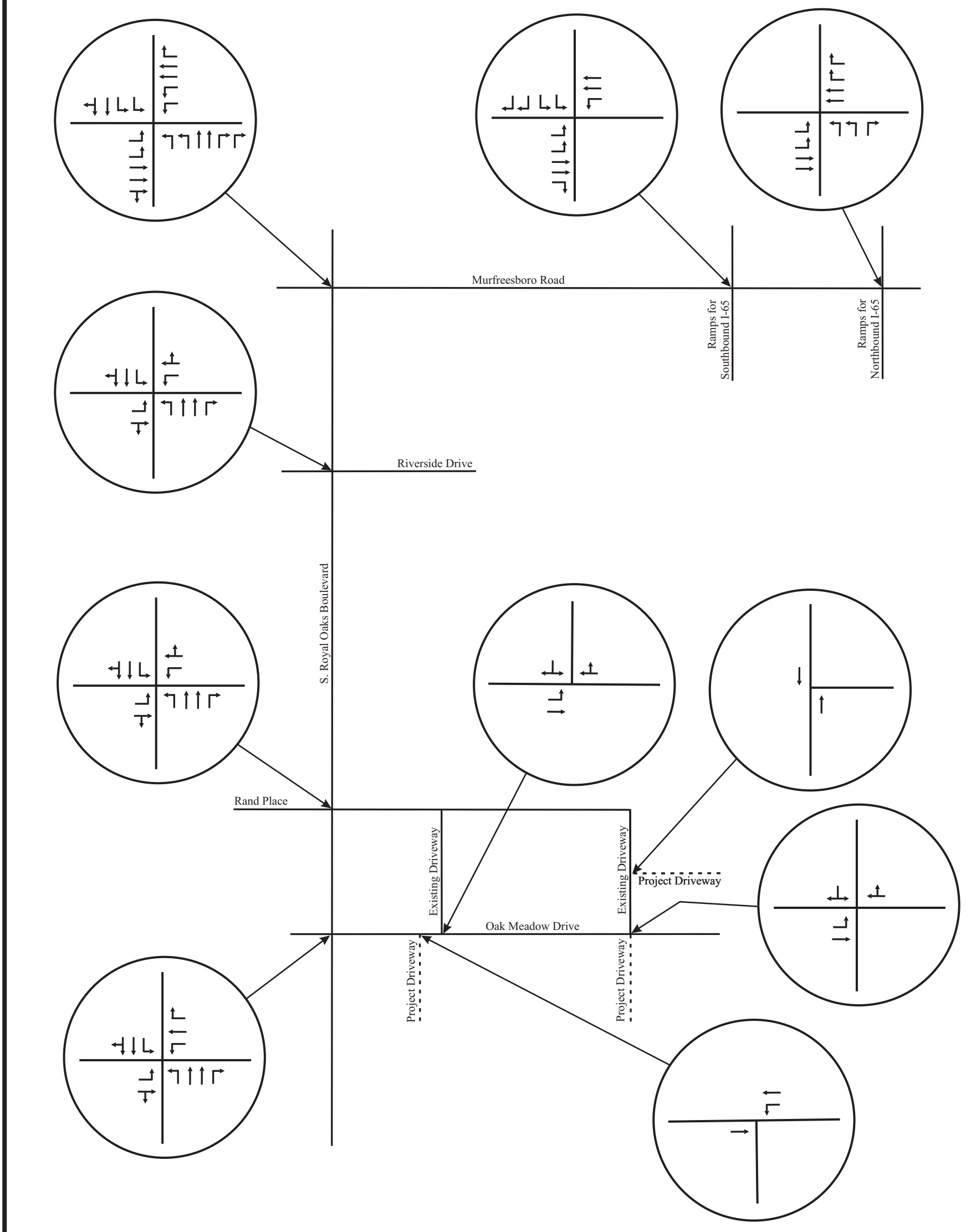

Figure 3.
Existing Laneage at the Intersections within the Study Area

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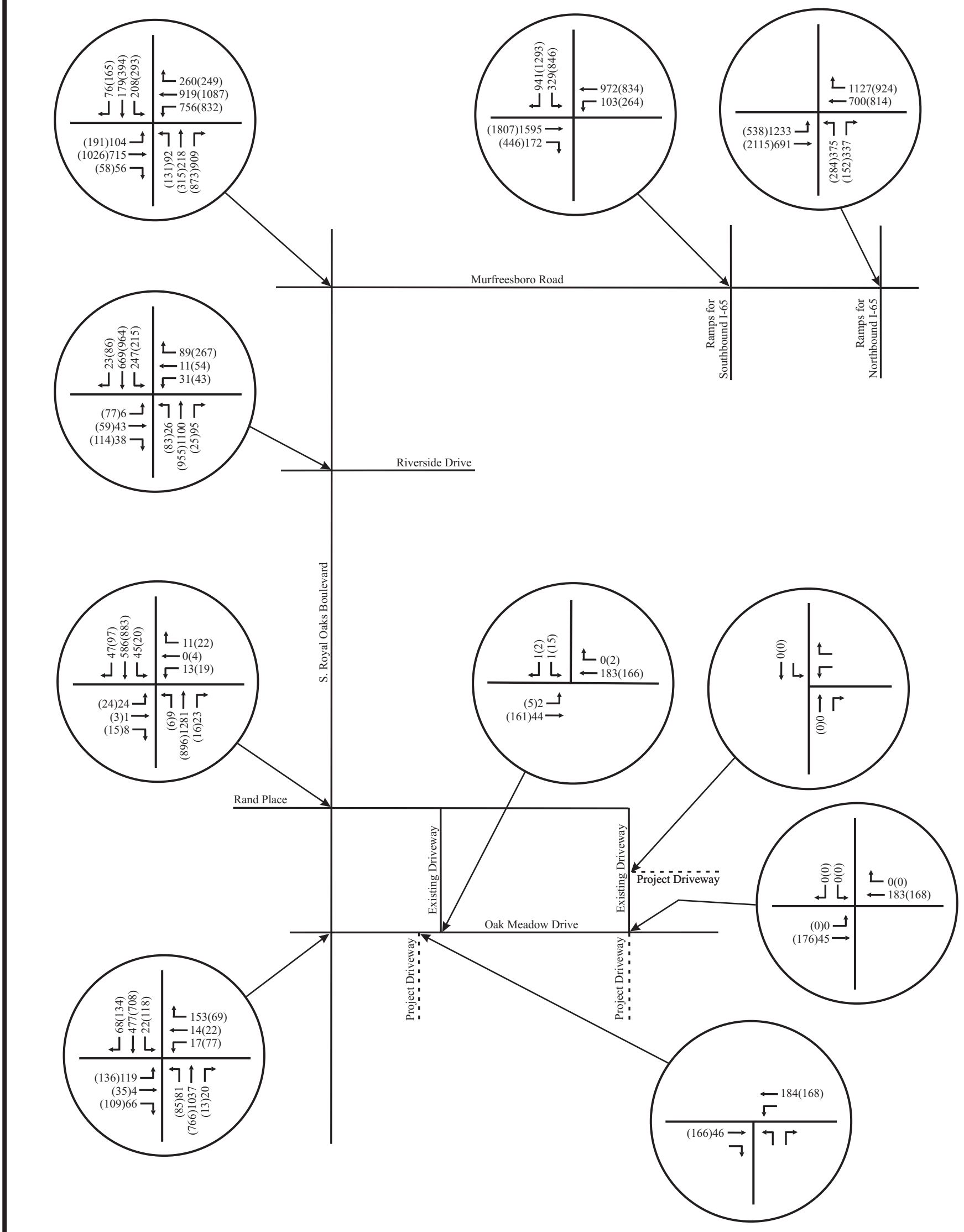

Figure 4.
Existing Peak Hour Traffic Volumes within the Study Area

TABLE 1. DESCRIPTIONS OF LOS FOR SIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay per Vehicle (sec)
A	Operations with very low control delay. Progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	Operations with stable flows. This generally occurs with good progression, short cycle lengths, or both. More vehicles stop than for LOS A, causing higher levels of average delay.	> 10 and ≤ 20
C	Operations with stable flow. Occurs with fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	> 20 and ≤ 35
D	Approaching unstable flow. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop.	> 35 and ≤ 55
E	Unstable flow. In many cases, this is considered to be the limit for acceptable delay. These high delays generally indicate poor progression, long cycle lengths, and high v/c ratios.	> 55 and ≤ 80
F	Unacceptable delay. This condition often occurs with oversaturation or with high v/c ratios. Poor progression and long cycle lengths may also cause such delay levels.	> 80

Source: Highway Capacity Manual 2010 (HCM2010)

TABLE 2. DESCRIPTIONS OF LOS FOR UNSIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay (sec/veh)
A	Minimal delay	≤ 10
B	Brief delay	> 10 and ≤ 15
C	Average delay	> 15 and ≤ 25
D	Significant delay	> 25 and ≤ 35
E	Long delay	> 35 and ≤ 50
F	Extreme delay	> 50

Source: Highway Capacity Manual 2010 (HCM 2010)

TABLE 3. EXISTING PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
Oak Meadow Drive and the Eastern Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
Oak Meadow Drive and the Western Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	32 feet	LOS B	47 feet
	Northbound Thrus	LOS B	308 feet	LOS B	268 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	12 feet	LOS A	64 feet
	Southbound Thrus/Right Turns	LOS A	130 feet	LOS C	356 feet
	Eastbound Left Turns	LOS D	120 feet	LOS D	137 feet
	Eastbound Thrus/Right Turns	LOS B	13 feet	LOS C	63 feet
	Westbound Left Turns	LOS C	27 feet	LOS D	82 feet
	Westbound Thrus	LOS D	25 feet	LOS D	35 feet
	Westbound Right Turns	LOS B	88 feet	LOS A	33 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS D	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS B	1 veh

	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS B	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	11 feet	LOS B	55 feet
	Northbound Thrus	LOS B	320 feet	LOS C	464 feet
	Northbound Right Turns	LOS A	26 feet	LOS A	0 feet
	Southbound Left Turns	LOS D	161 feet	LOS C	91 feet
	Southbound Thrus/Right Turns	LOS A	85 feet	LOS A	161 feet
	Eastbound Left Turns	LOS D	18 feet	LOS F	214 feet
	Eastbound Thrus/Right Turns	LOS D	99 feet	LOS C	141 feet
	Westbound Left Turns	LOS E	58 feet	LOS D	70 veh
	Westbound Thrus/Right Turns	LOS B	24 feet	LOS D	255 veh
	Overall Intersection	**LOS B**		**LOS C**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	88 feet	LOS E	144 feet
	Eastbound Thrus / Right Turns	LOS D	310 feet	LOS D	336 feet
	Westbound Left Turns	LOS D	412 feet	LOS F	499 feet
	Westbound Thrus	LOS D	539 feet	LOS D	492 feet
	Westbound Right Turns	LOS A	80 feet	LOS B	120 feet
	Northbound Left Turns	LOS E	73 feet	LOS E	103 feet
	Northbound Thrus	LOS D	146 feet	LOS E	218 feet
	Northbound Right Turns	LOS C	567 feet	LOS D	617 feet
	Southbound Left Turns	LOS E	148 feet	LOS F	242 feet

	Southbound Thrus / Right Turns	LOS D	141 feet	LOS E	398 feet
	Overall Intersection	**LOS D**		**LOS E**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	330 feet	LOS E	609 feet
	Eastbound Right Turns	LOS A	51 feet	LOS C	265 feet
	Westbound Left Turns	LOS E	156 feet	LOS F	465 feet
	Westbound Thrus	LOS B	273 feet	LOS C	337 feet
	Southbound Left Turns	LOS D	164 feet	LOS D	465 feet
	Southbound Right Turns	LOS E	617 feet	LOS F	1065 feet
	Overall Intersection	**LOS C**		**LOS E**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	913 feet	LOS E	341 feet
	Eastbound Thrus	LOS A	71 feet	LOS C	370 feet
	Westbound Thrus	LOS D	337 feet	LOS C	406 feet
	Westbound Right Turns	LOS C	502 feet	LOS A	234 feet
	Northbound Left Turns	LOS F	302 feet	LOS E	201 feet
	Northbound Right Turns	LOS C	225 feet	LOS D	172 feet
	Overall Intersection	**LOS E**		**LOS C**	

4. PROJECTION OF BACKGROUND TRAFFIC VOLUMES

In order to account for the traffic growth which will occur within the study area because of typical growth, background traffic volumes were established for the intersections within the study area. Specifically, in order to account for typical growth within the study area, consideration was given to the historical traffic volumes near the project site. The Tennessee Department of Transportation (TDOT) conducts an annual count program throughout the state. This count program includes the annual collection of average daily traffic (ADT) counts at numerous fixed locations. As shown in Table 4, the daily traffic volumes within the study area have increased 2.65% per year since 2006. Based on this information, for the purposes of this study, the existing traffic volumes at the intersections within the study area were increased by 8% to represent initial background traffic volumes in the Year 2018, as shown in Figure 5A.

TABLE 4. HISTORICAL TRAFFIC VOLUMES IN THE STUDY AREA

Year	Station 164 S. Royal Oaks Blvd ADT	Annual Growth	
2006	18,274		
2007	17,787	-2.66%	
2008	20,374	14.54%	
2009	19,666	-3.48%	
2010	19,324	-1.74%	
2011	19,090	-1.21%	
2012	19,435	1.81%	
2013	20,343	4.67%	
2014	22,118	8.73%	**Overall Growth**
2015	22,638	2.35%	**2.65%**

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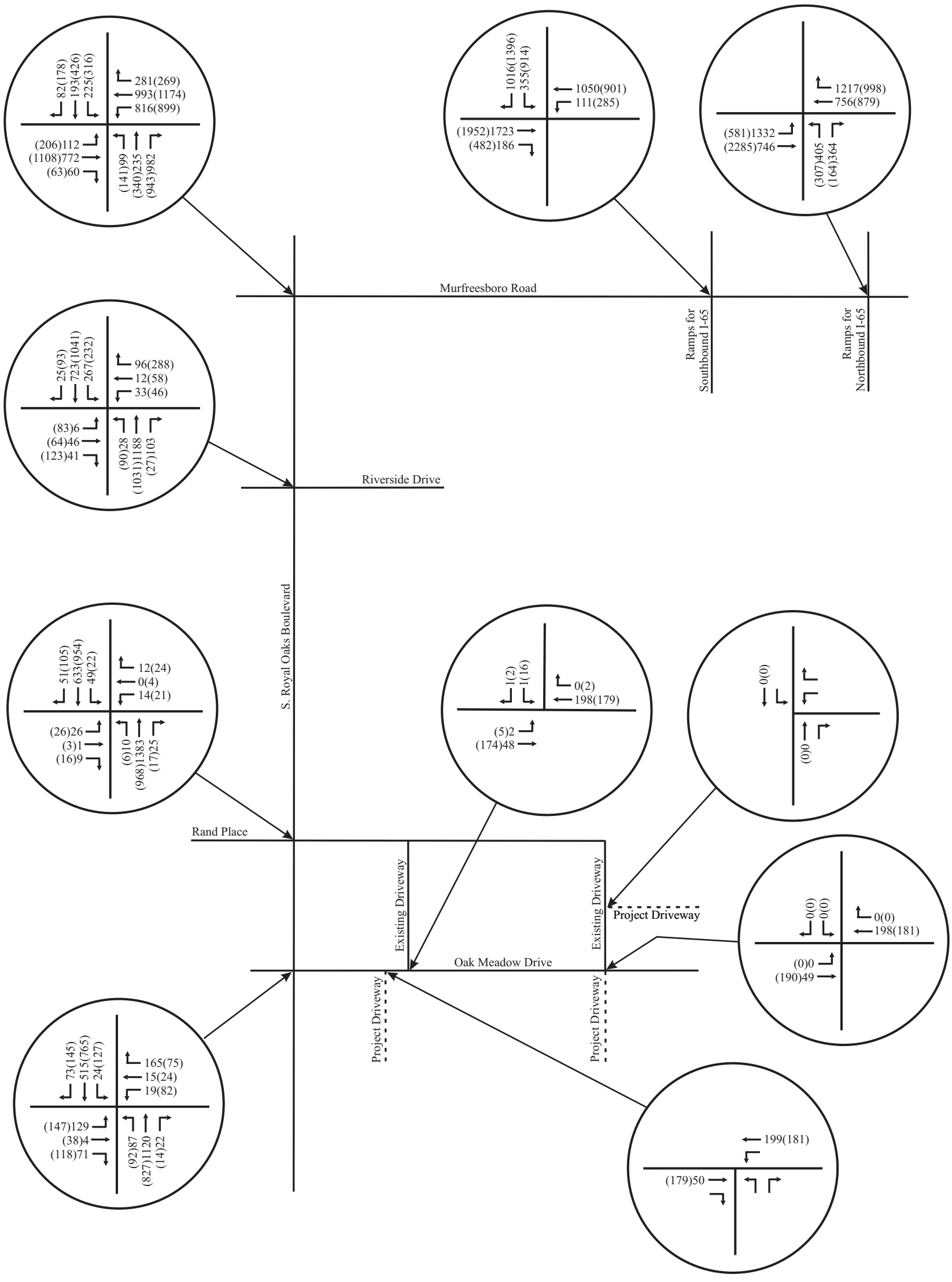

Figure 5A.
Initial Background Peak Hour Traffic Volumes within the Study Area

It is important to note that a day care center is under construction on the north side of S. Royal Oaks Boulevard at Mack Hatcher Parkway, southwest of the proposed project. It is likely that a significant portion of the traffic that will be generated by the day care center will be pass-by traffic that is already traveling on the S. Royal Oaks Boulevard corridor. The 8% growth rate applied to the existing traffic volumes will account for the additional traffic that will be generated by the day care center.

Also, it is important to note that an assisted living facility with 208 beds is under construction on the north side of Oak Meadow Drive, opposite the southern project site for the proposed project. For the purposes of this study, trip generation calculations were conducted in order to identify how much traffic is expected to be generated by the assisted living facility. Trip generation data for daily and peak hour trips were identified from Trip Generation, Ninth Edition, which was published by the Institute of Transportation Engineers (ITE) in 2012. Table 5 presents the daily and peak hour trip generations, and these calculations are included in Appendix D.

TABLE 5. TRIP GENERATION (SOMERBY ASSISTED LIVING FACILITY)

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Assisted Living Facility (LUC 254)	208 beds	570	34	13	30	47

Figures 5B and 5C include the directional distribution and assignment of peak hour traffic volumes that are expected to be generated by the assisted living facility.

The peak hour traffic volumes shown in Figures 5B and 5C were added to the traffic volumes shown in Figure 5A in order to establish the final background traffic volumes shown in Figure 5D. Using the background peak hour traffic volumes, capacity analyses were conducted for the intersections within the study area. For these analyses, it was assumed that all existing laneage and traffic control will be maintained and no improvements will be provided. The results of the capacity analyses for the background peak hour traffic volumes are shown in Table 5, and Appendix C includes the capacity analyses worksheets. These analyses indicate that the background conditions are consistent with the existing conditions within the study area.

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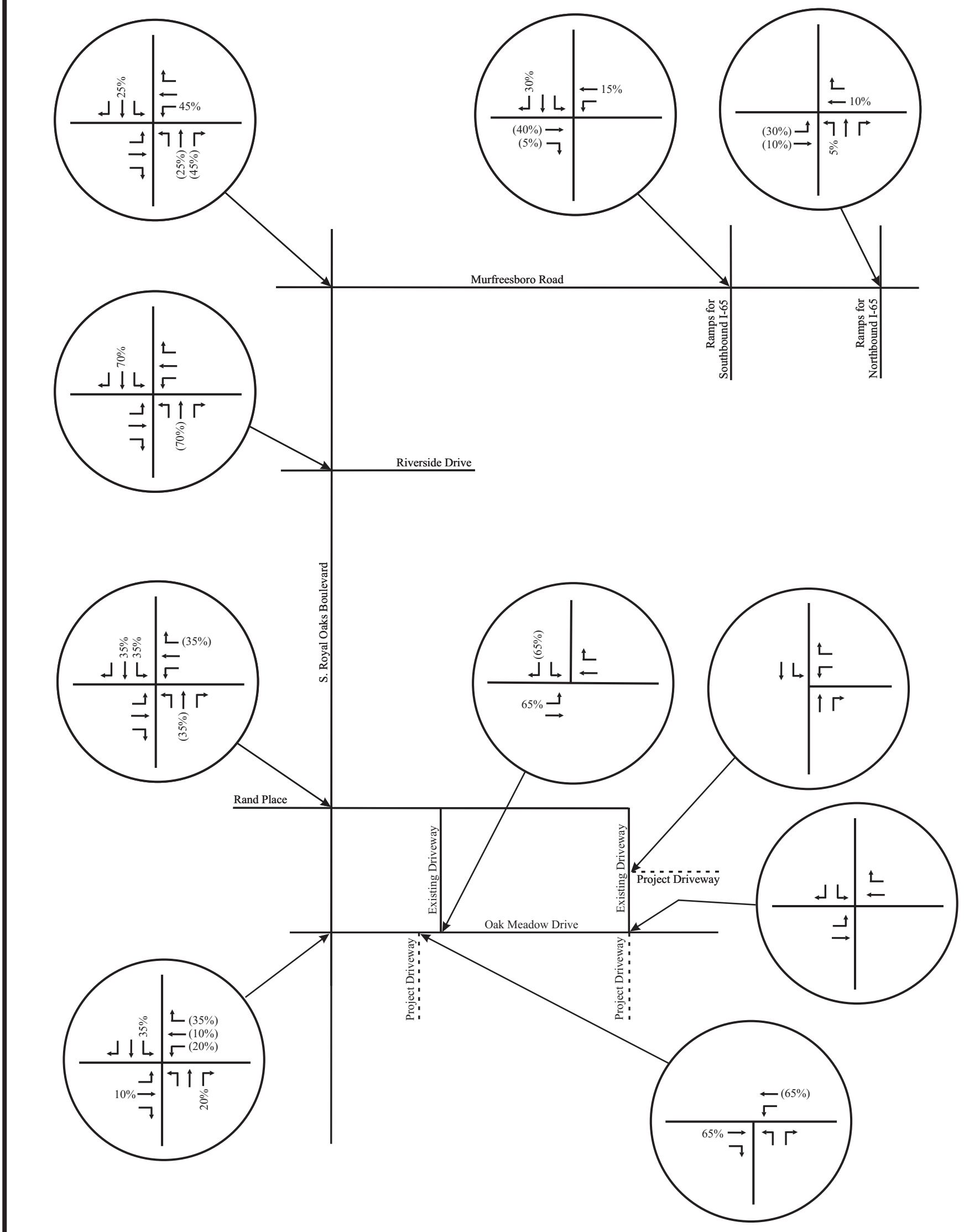

No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 5B.
Directional Distribution of Peak Hour Traffic Generated by the Somerby Assisted Living Facility

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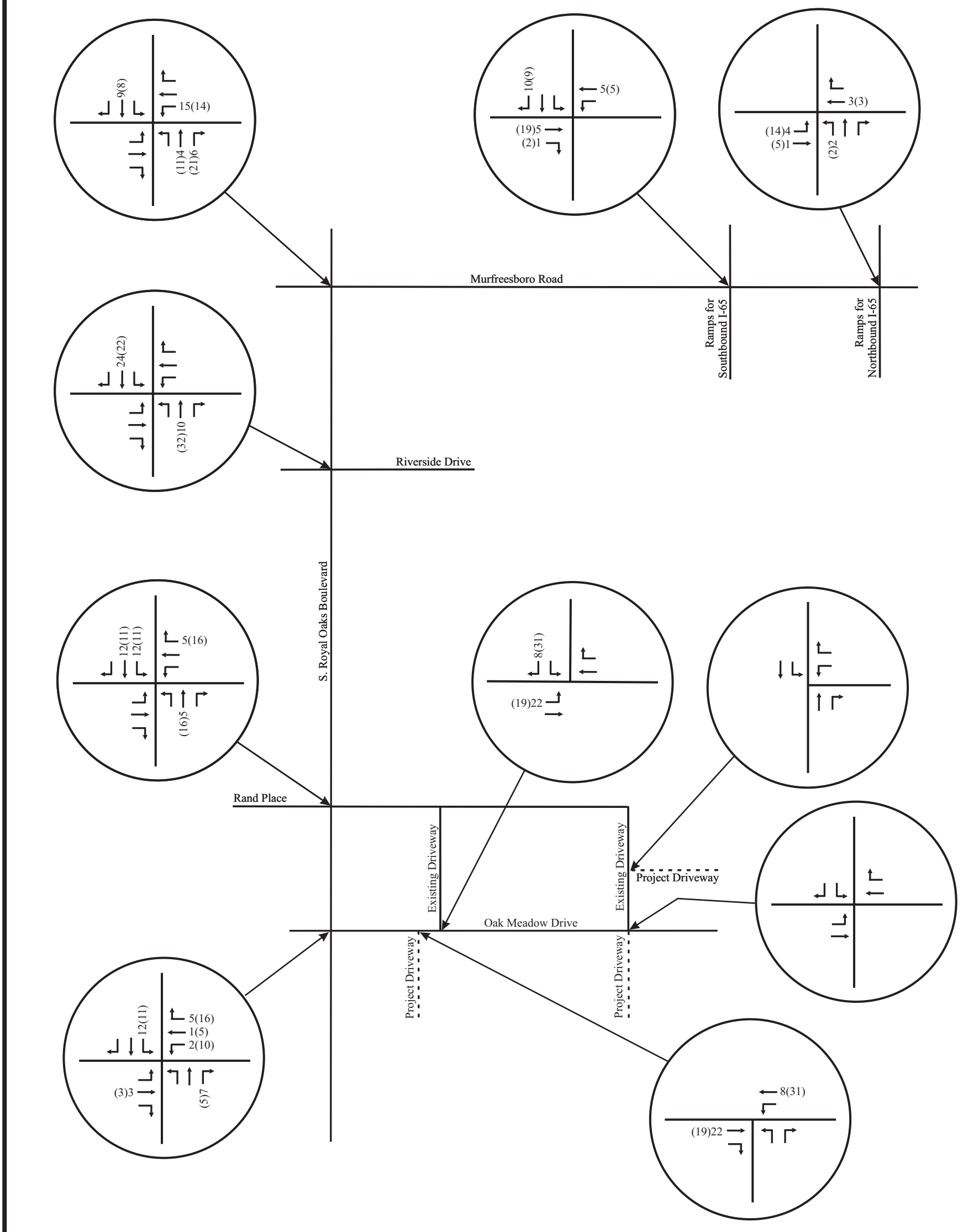

No Scale

N

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 5C.
Peak Hour Traffic Generated by the Somerby Assisted Living Facility

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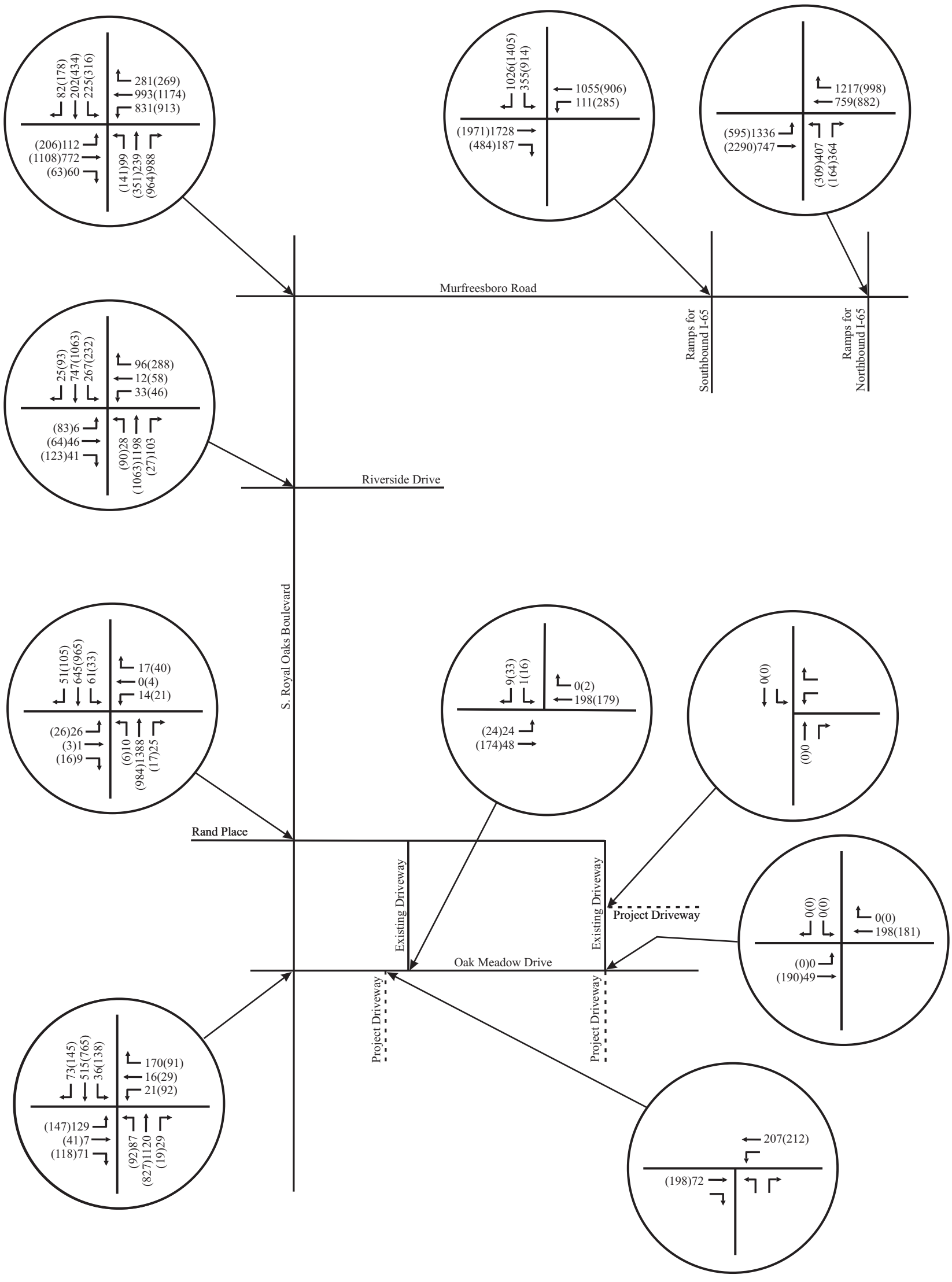

No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 5D.
Final Background Peak Hour Traffic Volumes within the Study Area

TABLE 5. BACKGROUND PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
Oak Meadow Drive and the Eastern Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
Oak Meadow Drive and the Western Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	35 feet	LOS C	56 feet
	Northbound Thrus	LOS B	351 feet	LOS B	308 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	18 feet	LOS B	78 feet
	Southbound Thrus/Right Turns	LOS B	147 feet	LOS C	423 feet
	Eastbound Left Turns	LOS D	127 feet	LOS D	142 feet
	Eastbound Thrus/Right Turns	LOS B	15 feet	LOS D	80 feet
	Westbound Left Turns	LOS C	30 feet	LOS D	92 feet
	Westbound Thrus	LOS D	27 feet	LOS D	41 feet
	Westbound Right Turns	LOS B	110 feet	LOS A	37 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS D	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS C	1 veh

	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS C	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	12 feet	LOS B	59 feet
	Northbound Thrus	LOS B	374 feet	LOS C	538 feet
	Northbound Right Turns	LOS A	31 feet	LOS A	0 feet
	Southbound Left Turns	LOS E	192 feet	LOS D	112 feet
	Southbound Thrus/Right Turns	LOS A	228 feet	LOS A	351 feet
	Eastbound Left Turns	LOS D	18 feet	LOS F	217 feet
	Eastbound Thrus/Right Turns	LOS D	114 feet	LOS C	170 feet
	Westbound Left Turns	LOS E	60 feet	LOS D	74 veh
	Westbound Thrus/Right Turns	LOS B	24 feet	LOS D	289 veh
	Overall Intersection	**LOS B**		**LOS C**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	93 feet	LOS E	155 feet
	Eastbound Thrus / Right Turns	LOS D	338 feet	LOS D	369 feet
	Westbound Left Turns	LOS E	435 feet	LOS F	521 feet
	Westbound Thrus	LOS D	554 feet	LOS D	521 feet
	Westbound Right Turns	LOS A	109 feet	LOS B	130 feet
	Northbound Left Turns	LOS D	78 feet	LOS E	109 feet
	Northbound Thrus	LOS D	153 feet	LOS E	236 feet
	Northbound Right Turns	LOS D	655 feet	LOS D	692 feet
	Southbound Left Turns	LOS E	159 feet	LOS F	272 feet

	Southbound Thrus / Right Turns	LOS D	159 feet	LOS E	465 feet
	Overall Intersection	**LOS D**		**LOS E**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	388 feet	LOS E	672 feet
	Eastbound Right Turns	LOS A	50 feet	LOS C	295 feet
	Westbound Left Turns	LOS E	163 feet	LOS F	520 feet
	Westbound Thrus	LOS B	294 feet	LOS C	407 feet
	Southbound Left Turns	LOS D	178 feet	LOS D	515 feet
	Southbound Right Turns	LOS F	738 feet	LOS F	1235 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	1028 feet	LOS E	340 feet
	Eastbound Thrus	LOS A	76 feet	LOS C	518 feet
	Westbound Thrus	LOS D	372 feet	LOS C	467 feet
	Westbound Right Turns	LOS C	573 feet	LOS B	311 feet
	Northbound Left Turns	LOS F	337 feet	LOS E	218 feet
	Northbound Right Turns	LOS D	341 feet	LOS D	190 feet
	Overall Intersection	**LOS F**		**LOS C**	

5. IMPACTS OF PROPOSED DEVELOPMENT

5.1 TRIP GENERATION

Trip generation calculations were conducted in order to identify how much traffic will be generated by the proposed project. Trip generation data for daily and peak hour trips were identified from Trip Generation, Ninth Edition, which was published by the Institute of Transportation Engineers (ITE) in 2012. Table 6A presents the daily and peak hour trip generations for proposed townhomes, and these calculations are included in Appendix D.

TABLE 6A. TRIP GENERATION FOR THE PROPOSED PROJECT

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Multi-Family (LUC 220) **South Site**	98 units	652	10	40	39	21
Multi-Family (LUC 220) **North Site**	204 units	1,356	21	83	82	44
TOTAL	**302 units**	**2,008**	**31**	**123**	**121**	**65**
Future Commercial Development	15,000 sq.ft.	664	49	53	18	23

Also, trip generation calculations were conducted in order to identify how much traffic might be generated by office and retail land uses that could be developed on the project sites instead of multi-family residential. For purposes of these analyses, two land use scenarios were considered:

1. **40,000 sq.ft.** office space on the southern project site and **100,000 sq.ft** of office space on the northern project site

2. **30,000 sq.ft.** retail space on the southern project site and **60,000 sq.ft** of retail space on the northern project site

Table 6B presents the daily and peak hour trip generations for these alternative land uses.

TABLE 6B. TRIP GENERATION FOR ALTERNATIVE LAND USES

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Office (LUC 710)	140,000 sq.ft.	1,696	220	30	40	195
Retail (LUC 820)	90,000 sq.ft.	6,342	91	56	268	290

5.2 TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

For the purposes of this study, it was estimated that the trips generated by the proposed project and the future commercial development will access the project site according to the directional distribution shown in Figures 6A, 6B, and 6C. It is important to note that these directional distributions were prepared with input and approval from the City of Franklin Engineering Department and their third-party private consultant, Neel-Schaffer, Inc. The development of these distributions was based on the following factors:

- existing land use characteristics,
- the directions of approach of the existing traffic,
- the access proposed for the project, and
- the locations of population centers in the area.

The peak hour trip generations and directional distributions were used to add the site-generated trips to the roadway system. Figures 7A, 7B, 7C, and 7D include the peak hour traffic volumes that are expected to be generated by the proposed project and the future commercial development.

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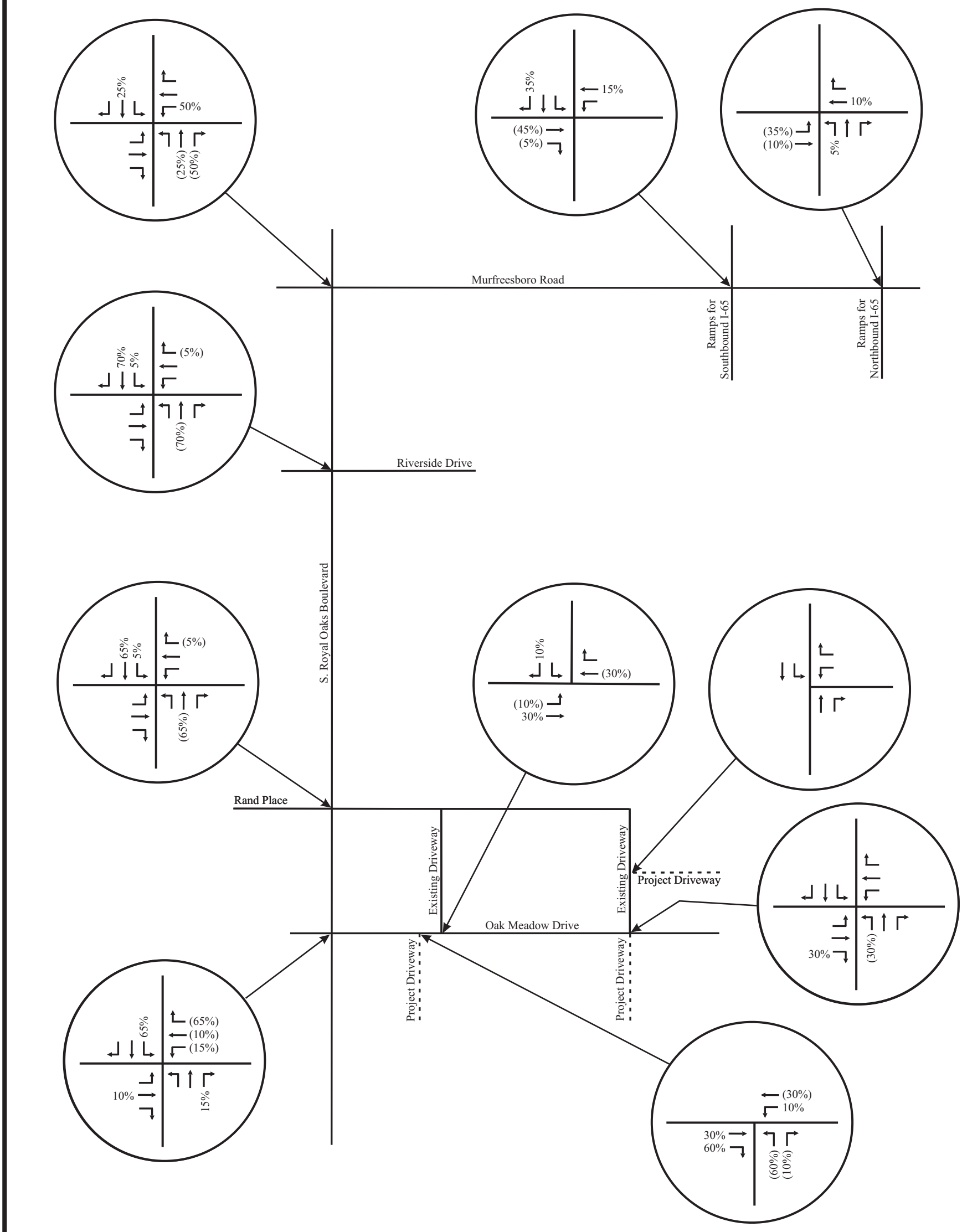

No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6A.
Directional Distribution of Peak Hour Traffic Volumes Generated by the Proposed Apartments (Southern Site)

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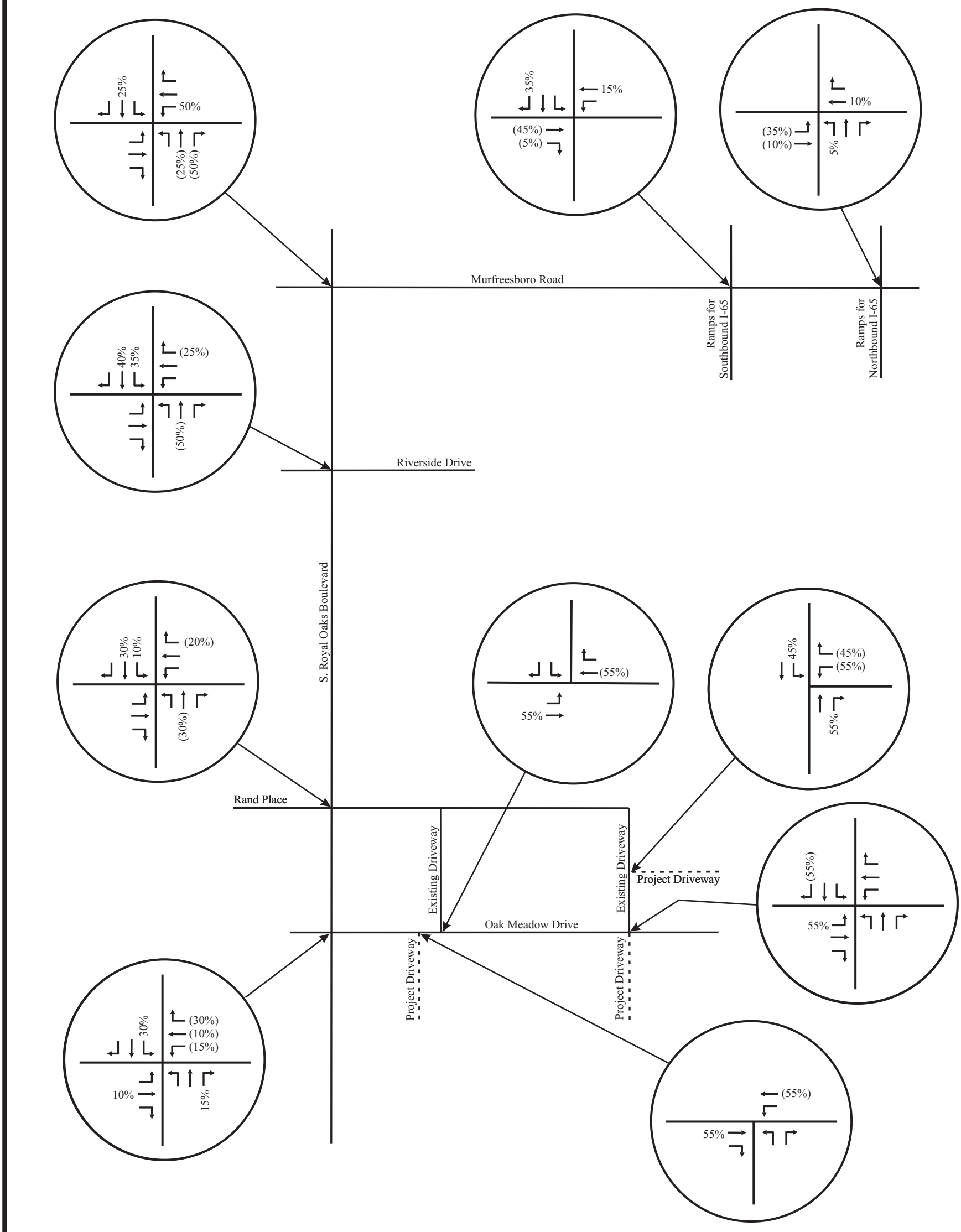

No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6B.
Directional Distribution of Peak Hour Traffic Volumes Generated by the Proposed Apartments (Northern Site)

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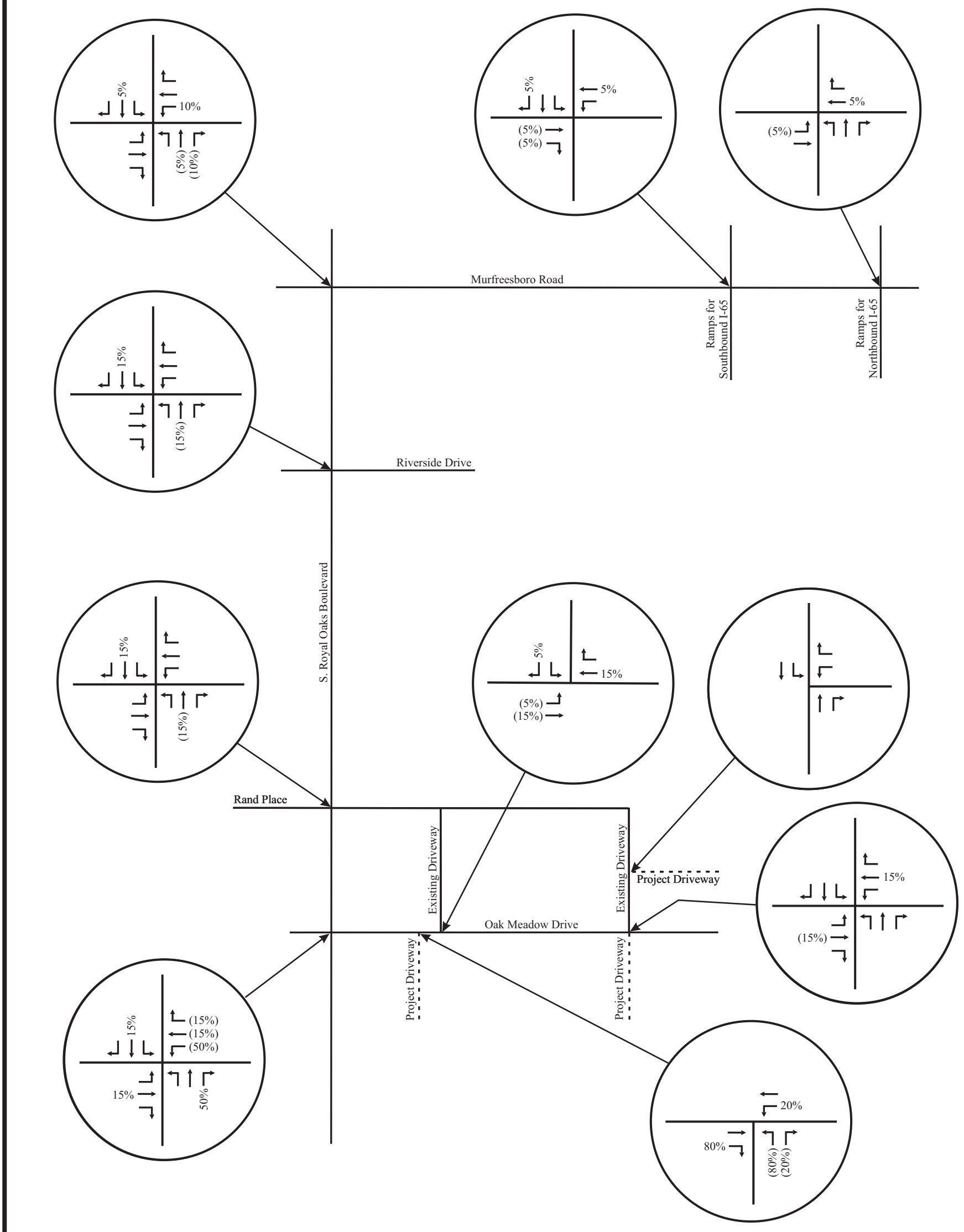

No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6C.
Directional Distribution of Peak Hour Traffic Volumes Generated by the Future Retail Center

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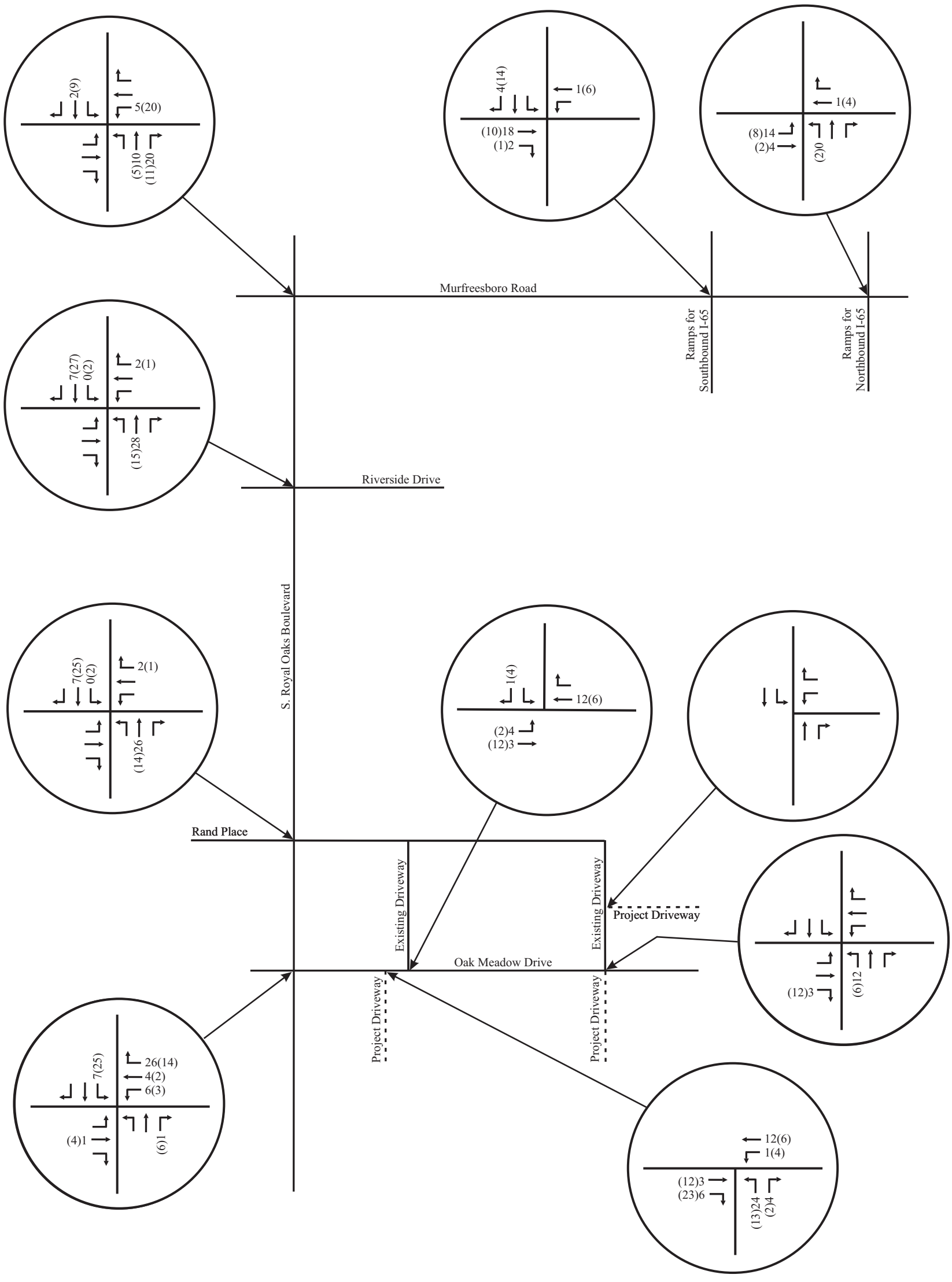

No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7A.
Peak Hour Traffic Volumes Generated by the Proposed Apartments (Southern Site)

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Traffic Engineering and Planning

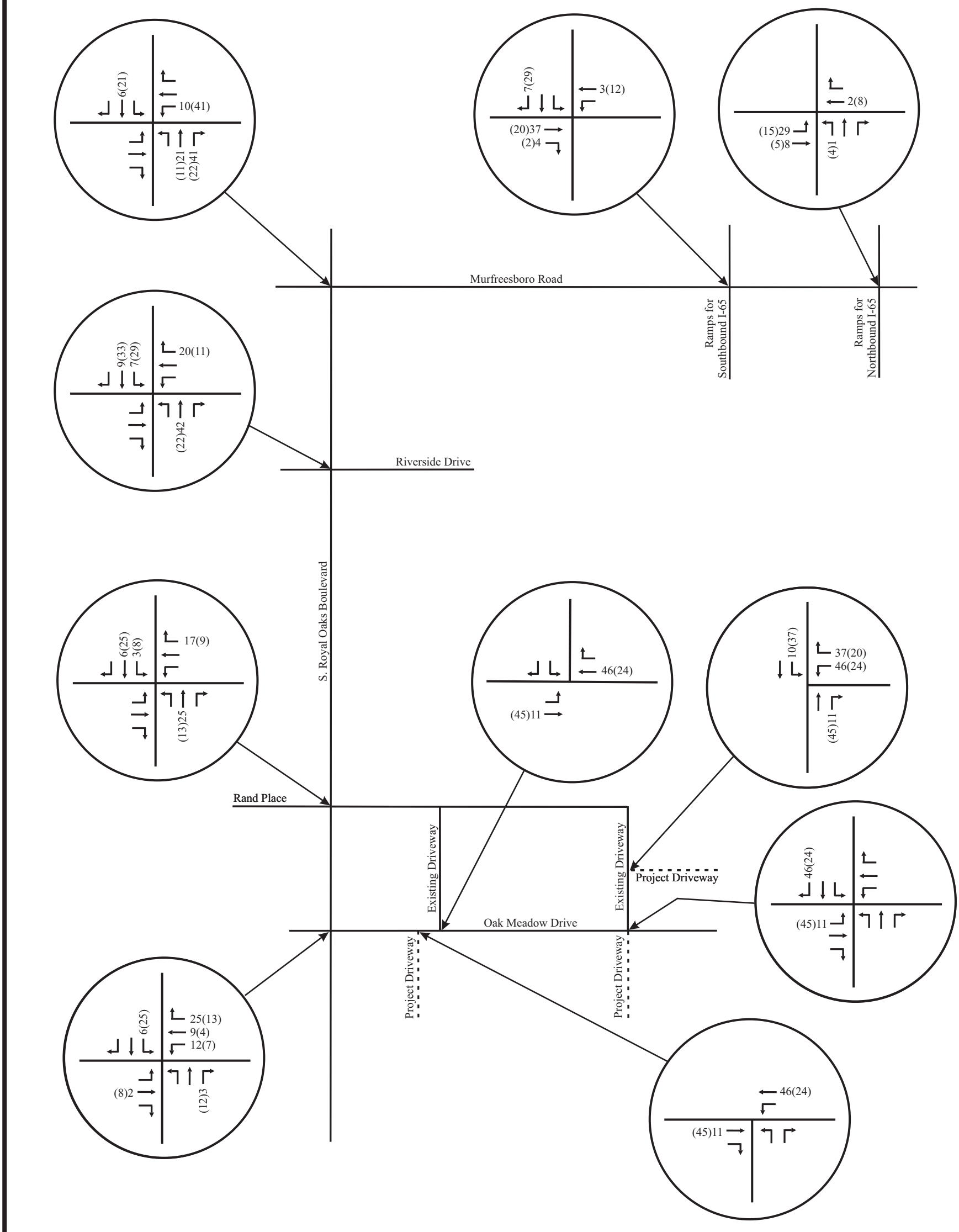

Figure 7B.
Peak Hour Traffic Volumes Generated by the Proposed Apartments (Northern Site)

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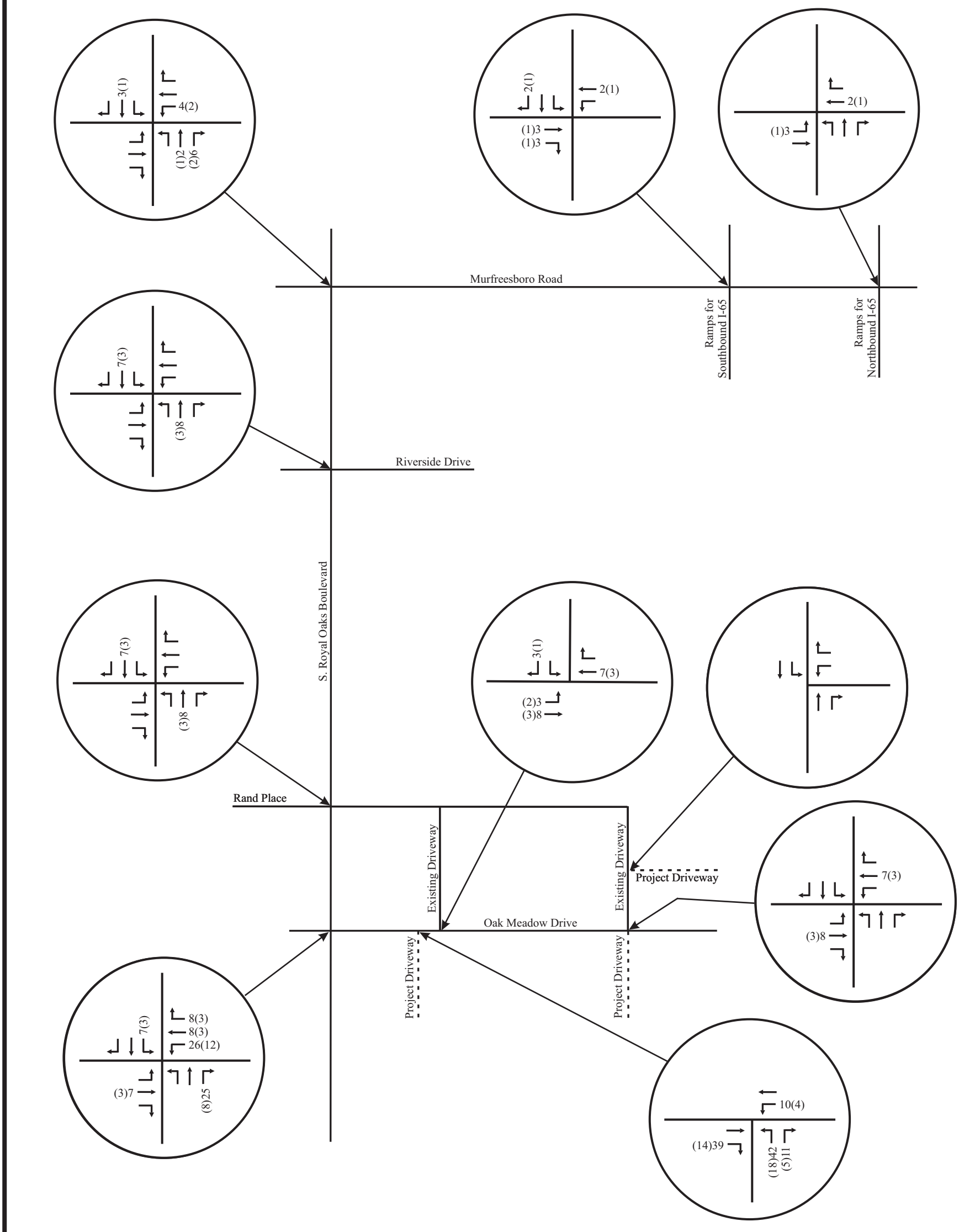
Traffic Engineering and Planning



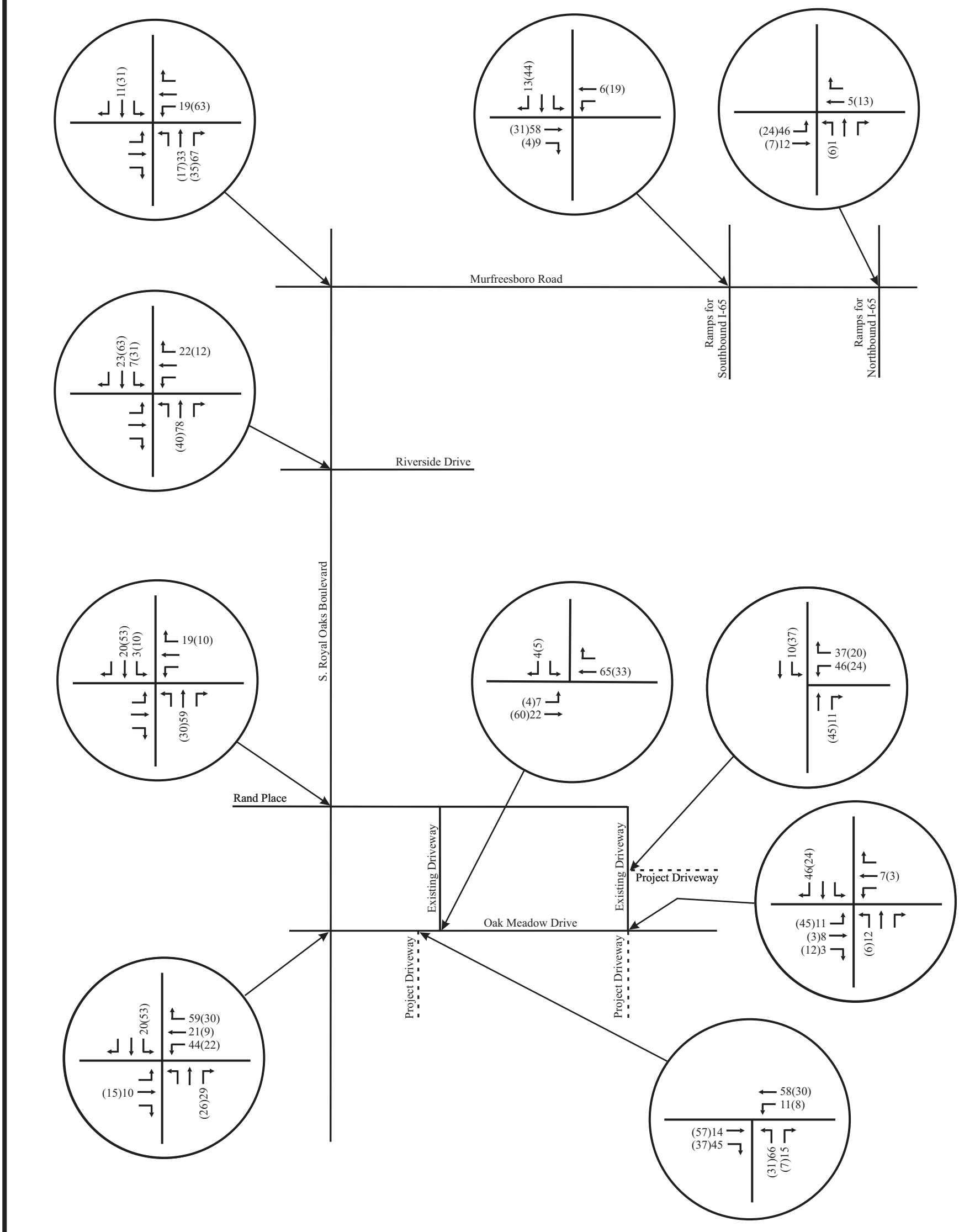
N

No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7C.
Peak Hour Traffic Volumes Generated by the Future Retail Center

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning



No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7D.
Total Peak Hour Traffic Volumes Generated by the Proposed Apartments (Total Both Sites) and Future Retail

5.3 CAPACITY ANALYSES

In order to identify the projected peak hour traffic volumes at the completion of the proposed project, the trips generated by the project were added to the background peak hour traffic volumes. The resulting peak hour volumes are shown in Figure 8.

Using the total projected peak hour traffic volumes, capacity analyses were conducted in order to determine the impact of the project on the roadway system. Specifically, these capacity analyses were used to evaluate the need for roadway and traffic control improvements within the study area. For these analyses, the following assumptions were made:

- All existing laneage and traffic control will be maintained and no improvements will be provided.

- Each of the project accesses on Oak Meadow Drive will be constructed to include one entering lane and one exiting lane.

- The access on S. Royal Oaks Boulevard for the future commercial project will be constructed to include one entering lane and two exiting lanes, striped as a separate left turn lane and a shared through/right turn lane.

The results of the capacity analyses for the total projected peak hour traffic volumes are shown in Table 7, and Appendix C includes the capacity analyses worksheets. These analyses indicate that the total projected conditions with full build-out of the project are consistent with the existing and background conditions within the study area.

Also, additional analyses were conducted in order to identify how well the intersection of S. Royal Oaks Boulevard and Riverside Drive / Center Point Place would operate if the traffic signal were modified to include protected signal phases for eastbound and westbound motorists. The results of these analyses are shown in Table 7, and Appendix C includes the capacity analyses worksheets. As shown, the additional signal phases would marginally reduce the level of service at this intersection during the PM peak hour.

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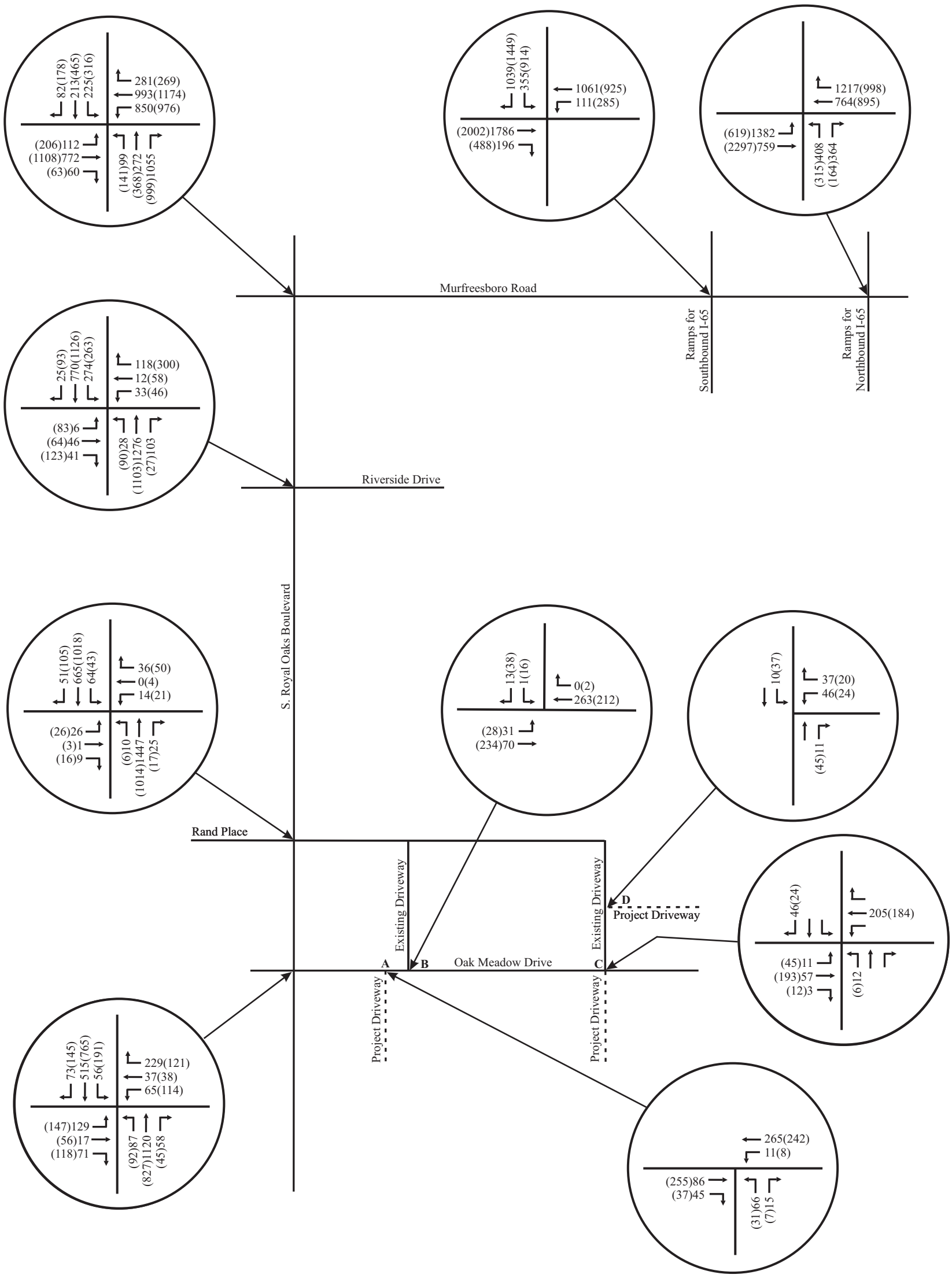


No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 8.
Total Projected Peak Hour Traffic Volumes at the Completion of the Proposed Apartments and Future Retail

TABLE 7. PROJECTED PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
A - Oak Meadow Drive and the Western Access for the Apartments / Retail	Westbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Northbound Left and Right Turns	LOS B	1 veh	LOS B	1 veh
B - Oak Meadow Drive and the Western Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS B	1 veh	LOS B	1 veh
C - Oak Meadow Drive and the Eastern Access for Home Depot / Apartments	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Westbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Northbound Left/Thru/Right Turns	LOS B	1 veh	LOS B	1 veh
	Southbound Left/Thru/Right Turns	LOS A	1 veh	LOS A	1 veh
D - Eastern Access for Home Depot / Access for Northern Apartments	Southbound Left Turns / Thrus	LOS A	1 veh	LOS A	1 veh
	Westbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	37 feet	LOS C	70 feet
	Northbound Thrus	LOS B	362 feet	LOS C	328 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	26 feet	LOS C	116 feet
	Southbound Thrus/Right Turns	LOS B	152 feet	LOS C	447 feet
	Eastbound Left Turns	LOS D	124 feet	LOS C	135 feet
	Eastbound Thrus/Right Turns	LOS B	22 feet	LOS D	108 feet
	Westbound Left Turns	LOS C	69 feet	LOS D	105 feet
	Westbound	LOS D	48 feet	LOS D	49 feet

	Thrus				
	Westbound Right Turns	LOS C	161 feet	LOS A	40 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS E	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS C	1 veh
	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS C	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	12 feet	LOS C	59 feet
	Northbound Thrus	LOS B	414 feet	LOS C	567 feet
	Northbound Right Turns	LOS A	31 feet	LOS A	0 feet
	Southbound Left Turns	LOS F	181 feet	LOS D	133 feet
	Southbound Thrus/Right Turns	LOS A	343 feet	LOS B	599 feet
	Eastbound Left Turns	LOS E	18 feet	LOS F	217 feet
	Eastbound Thrus/Right Turns	LOS D	114 feet	LOS C	176 feet
	Westbound Left Turns	LOS E	60 feet	LOS D	74 veh
	Westbound Thrus/Right Turns	LOS B	21 feet	LOS D	300 veh
	Overall Intersection	**LOS C**		**LOS C**	
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized and with protected left turn signal	Northbound Left Turns	LOS A	19 feet	LOS C	70 feet
	Northbound Thrus	LOS B	571 feet	LOS D	636 feet
	Northbound	LOS A	31 feet	LOS A	0 feet

phases for eastbound and westbound motorists)	Right Turns				
	Southbound Left Turns	LOS F	405 feet	LOS F	334 feet
	Southbound Thrus/Right Turns	LOS B	262 feet	LOS C	671 feet
	Eastbound Left Turns	LOS D	14 feet	LOS D	110 feet
	Eastbound Thrus/Right Turns	LOS E	105 feet	LOS D	181 feet
	Westbound Left Turns	LOS D	52 feet	LOS D	65 veh
	Westbound Thrus/Right Turns	LOS B	21 feet	LOS D	340 veh
	Overall Intersection	**LOS C**		**LOS D**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	93 feet	LOS E	155 feet
	Eastbound Thrus / Right Turns	LOS D	338 feet	LOS D	368 feet
	Westbound Left Turns	LOS E	446 feet	LOS F	567 feet
	Westbound Thrus	LOS D	544 feet	LOS D	517 feet
	Westbound Right Turns	LOS A	122 feet	LOS B	125 feet
	Northbound Left Turns	LOS D	76 feet	LOS E	105 feet
	Northbound Thrus	LOS D	174 feet	LOS E	249 feet
	Northbound Right Turns	LOS D	696 feet	LOS D	716 feet
	Southbound Left Turns	LOS E	159 feet	LOS F	272 feet
	Southbound Thrus / Right Turns	LOS D	167 feet	LOS F	505 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	406 feet	LOS E	692 feet
	Eastbound Right Turns	LOS A	47 feet	LOS C	295 feet
	Westbound	LOS E	164 feet	LOS F	521 feet

	Left Turns				
	Westbound Thrus	LOS B	297 feet	LOS C	430 feet
	Southbound Left Turns	LOS D	178 feet	LOS D	515 feet
	Southbound Right Turns	LOS F	754 feet	LOS F	1297 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	1078 feet	LOS E	344 feet
	Eastbound Thrus	LOS A	75 feet	LOS C	499 feet
	Westbound Thrus	LOS D	375 feet	LOS C	485 feet
	Westbound Right Turns	LOS C	573 feet	LOS B	327 feet
	Northbound Left Turns	LOS F	338 feet	LOS E	222 feet
	Northbound Right Turns	LOS E	351 feet	LOS D	190 feet
	Overall Intersection	**LOS F**		**LOS D**	

5.4 CAPACITY ANALYSIS COMPARISON

The results of the capacity analyses for the existing, background, and total projected peak hour traffic volumes are included in Tables 8 and 9 for comparison purposes. Also, the levels of service that worsen from background conditions to total projected conditions with the proposed project are highlighted in red. Finally, additional analyses were conducted in order to identify how well the intersections within the study area would operate if a third northbound through lane were provided on S. Royal Oaks between Oak Meadow Drive and Murfreesboro Road. Specifically, for these analyses, the northbound right turn lanes at Oak Meadow Drive, Rand Place, and Riverside Drive were converted to shared through/right turn lanes. Also, the analyses included the modification of the existing traffic signal at the intersection of S. Royal Oaks Boulevard and Riverside Drive / Center Point Place to include protected signal phases for eastbound and westbound motorists. The results of these additional analyses are shown in Tables 8 and 9. These comparisons and analyses that reveal poor levels of service are described below:

S. Royal Oaks Boulevard and Oak Meadow Drive
This intersection operates at LOS B during the AM peak hour and LOS C during the PM peak hour under existing, background, and total projected conditions.

S. Royal Oaks Boulevard and Riverside Drive / Center Point Place
This intersection operates at LOS B during the AM peak hour and LOS C during the PM peak hour under existing and background conditions. With the proposed project, this intersection will operate at LOS C during both peak hours. Also, if the existing traffic signal were modified to include protected signal phases for eastbound and westbound motorists, this intersection would operate at LOS C during the AM peak hour and LOS D during the PM peak hour.

Murfreesboro Road and Royal Oaks Boulevard
This intersection operates poorly during the PM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound throughs, westbound throughs, westbound left turns, and northbound right turns are all approximately equal during both peak hours. Although some of these turning movements can operate during the same signal phases, the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

Murfreesboro Road and the Ramps for Southbound I-65
This intersection operates poorly during the PM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound throughs, westbound throughs, and southbound right turns are all significantly high during both peak hours, and the traffic volume for the southbound left turns are significantly high during the PM peak hour. Although some of these turning movements can operate during the same signal phases, the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

Murfreesboro Road and the Ramps for Northbound I-65

This intersection operates poorly during the AM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound left turns and westbound right turns are significantly high during the AM peak hour, and the traffic volumes for the eastbound throughs and westbound right turns are significantly high during the PM peak hour. These turning movements cannot operate during the same signal phases, and the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

TABLE 8. COMPARISON OF AM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVELS OF SERVICE			
		EXISTING CONDITIONS	BACKGROUND CONDITIONS	TOTAL PROJECTED CONDITIONS	WITH THIRD NORTHBOUND TRAVEL LANE
S. Royal Oaks Boulevard and Oak Meadow Drive	Overall Intersection	LOS B (13.9 sec/veh)	LOS B (15.4 sec/veh)	LOS B (17.6 sec/veh)	LOS B (16.0 sec/veh)
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place	Overall Intersection	LOS B (14.0 sec/veh)	**LOS B** (17.3 sec/veh)	**LOS C** (20.5 sec/veh)	LOS C (30.8 sec/veh)
Murfreesboro Road and Royal Oaks Boulevard	Overall Intersection	LOS D (42.0 sec/veh)	LOS D (44.9 sec/veh)	LOS D (46.1 sec/veh)	LOS D (44.4 sec/veh)
Murfreesboro Road and Ramps for Southbound I-65	Overall Intersection	LOS C (31.7 sec/veh)	LOS D (39.6 sec/veh)	LOS D (41.2 sec/veh)	LOS D (41.6 sec/veh)
Murfreesboro Road and Ramps for Northbound I-65	Overall Intersection	LOS E (64.7 sec/veh)	LOS F (81.2 sec/veh)	LOS F (87.9 sec/veh)	LOS F (87.9 sec/veh)

TABLE 9. COMPARISON OF PM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVELS OF SERVICE			
		EXISTING CONDITIONS	BACKGROUND CONDITIONS	TOTAL PROJECTED CONDITIONS	WITH THIRD NORTHBOUND TRAVEL LANE
S. Royal Oaks Boulevard and Oak Meadow Drive	Overall Intersection	LOS C (21.9 sec/veh)	LOS C (25.3 sec/veh)	LOS C (28.1 sec/veh)	LOS C (26.9 sec/veh)
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place	Overall Intersection	LOS C (27.4 sec/veh)	LOS C (29.0 sec/veh)	**LOS C** (31.3 sec/veh)	**LOS D** (36.8 sec/veh)
Murfreesboro Road and Royal Oaks Boulevard	Overall Intersection	LOS E (61.2 sec/veh)	**LOS E** (72.3 sec/veh)	**LOS F** (80.6 sec/veh)	LOS E (78.8 sec/veh)
Murfreesboro Road and Ramps for Southbound I-65	Overall Intersection	LOS E (78.4 sec/veh)	LOS F (97.4 sec/veh)	LOS F (103.7 sec/veh)	LOS F (103.9 sec/veh)
Murfreesboro Road and Ramps for Northbound I-65	Overall Intersection	LOS C (29.5 sec/veh)	**LOS C** (34.2 sec/veh)	**LOS D** (35.1 sec/veh)	LOS D (35.1 sec/veh)

6. CONCLUSIONS AND RECOMMENDATIONS

The analyses presented in this study indicate the following information for the intersections that provide direct access to the project sites:

Oak Meadow Drive and the Western Project Access
At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the northbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low.

The existing center turn lane on Oak Meadow Drive should be restriped to provide a dedicated westbound left turn lane with 50 feet of storage for motorists turning onto the project access.

In order to identify the sight distances that will be available at the project access, sight triangles should be provided in conjunction with construction documents for the proposed project. These sight triangles should be developed based on guidelines that are included in A Policy on Geometric Design of Highways and Streets, which is published by the American Association of State Highway and Transportation Officials (AASHTO) and commonly known as The Green Book. Specifically, The Green Book indicates that for a speed of 40 mph, the minimum stopping sight distance is 305 feet. This is the distance that a motorist on Oak Meadow Drive needs to come to a stop if a vehicle turning from the project access creates a conflict. Also, based on The Green Book, the minimum intersection sight distance is 445 feet. This is the distance that a motorist exiting the project access needs to safely complete turns onto Oak Meadow Drive.

Oak Meadow Drive and the Western Home Depot Access
The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will remain very low. However, double yellow pavement markings should be provided on the Home Depot access in order to delineate travel lanes. Also, the existing center turn lane on Oak Meadow Drive should be restriped to provide a dedicated eastbound left turn lane with 50 feet of storage for motorists turning onto the Home Depot access.

Oak Meadow Drive and the Eastern Project Access / Home Depot Access
At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the northbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low.

At the completion of the proposed project, the existing double yellow pavement markings on the Home Depot access should be reapplied in order to delineate travel lanes. The existing center turn lane on Oak Meadow Drive should be restriped to provide a dedicated eastbound and westbound left turn lanes for motorists turning onto the Home Depot access and the project access. Each of these turn lanes should include at least 50 feet of storage.

In order to identify the sight distances that will be available at the project access, sight triangles should be provided in conjunction with construction documents for the proposed project. These sight triangles should be developed based on guidelines that are included in A Policy on Geometric Design of Highways and Streets, which is published by the American Association of State Highway and Transportation Officials (AASHTO) and commonly known as The Green Book. Specifically, The Green Book indicates that for a speed of 40 mph, the minimum stopping sight distance is 305 feet. This is the distance that a motorist on Oak Meadow Drive needs to come to a stop if a vehicle turning from the project access creates a conflict. Also, based on The Green Book, the minimum intersection sight distance is 445 feet. This is the distance that a motorist exiting the project access needs to safely complete turns onto Oak Meadow Drive.

Also, sight distance should be maximized for northbound/westbound motorists on Oak Meadow Drive by removing foliage and vegetation from the south side of Oak Meadow Drive.

Eastern Home Depot Access and the Project Access for the Northern Apartments

At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the westbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low. At the completion of the proposed project, the existing double yellow pavement markings on the Home Depot access should be reapplied in order to delineate travel lanes.

S. Royal Oaks Boulevard and Oak Meadow Drive

The capacity analyses indicate that all of the turning movements at this intersection will operate at acceptable levels of service. Also, the existing lengths of the turn lanes are adequate to accommodate the total projected traffic volumes with the completion of the proposed project. Finally, it is important to note that the westbound approach of Oak Meadow Drive already includes separate left, through, and right turn lanes at the intersection with S. Royal Oaks Boulevard, and the existing traffic signal already includes a right turn overlap signal phase for westbound motorists. Therefore, there are no additional dedicated turn lanes or traffic control modifications that can be provided at this location. Field observations and traffic counts confirm that the northbound and southbound through volumes are significant, particularly the northbound through movement during the AM peak hour. However, the proposed project will have a minimal impact on these conditions.

S. Royal Oaks Boulevard and Rand Place / Access for Home Depot

The capacity analyses indicate that all of the critical turning movements at this unsignalized intersection will operate at acceptable levels of service. Also, the existing lengths of the turn lanes are adequate to accommodate the total projected traffic volumes with the completion of the proposed project. Field observations and traffic counts confirm that the northbound and southbound through volumes are significant, particularly the northbound through movement during the AM peak hour. In addition, the field observations and traffic counts confirm that the eastbound and westbound left turn volumes are relatively low, presumably because left turns are challenging when the northbound and southbound through volumes are high. Finally, the

eastbound and westbound motorists have access to the existing traffic signal at Oak Meadow Drive. It is important to note that proposed project will have a minimal impact on these conditions. Also, it is important to note that this intersection is not an appropriate location for a traffic signal installation because of its proximity to the existing traffic signal at Oak Meadow Drive.

At the completion of the proposed project, the existing pavement markings on the Home Depot access should be reapplied in order to delineate travel lanes. At that time, consideration should be given to restriping the westbound travel lanes in order to provide a shared left turn / through lane and a separate right turn lane. This modification would reduce delays for the westbound right turns, which occur approximately twice as frequently as the westbound left turns.

S. Royal Oaks Boulevard and Riverside Drive / Center Point Place

The capacity analyses indicate that several turning movements at this intersection will operate at LOS C or better during both peak hours under existing, background, and total projected conditions. If the existing traffic signal were modified to include protected signal phases for eastbound and westbound motorists, this intersection would operate at LOS C during the AM peak hour and LOS D during the PM peak hour. However, this modification would reduce the potential for vehicle conflicts for eastbound and westbound motorists.

Also, it is important to note that the analyses indicate that providing a third northbound through lane on S. Royal Oaks Boulevard would not significantly reduce delays at this intersection.

Access for the Future Retail Site

Currently, the future retail parcel is not included in the site plan for the proposed apartments. Since building sizes, land uses, parking provisions, and driveways have not be established for this future development, no recommendations are made for the number and location of driveways or the laneage and traffic control that will be needed at the intersections that will provide access to the future retail development.

APPENDIX A
TRAFFIC IMPACT STUDY SCOPE PROVIDED BY
THE CITY OF FRANKLIN AND NEEL-SCHAFFER, INC.

Exhibit B

City of Franklin
Engineering Department

APPLICATION FORM
REQUEST FOR APPROVED TRANSPORTATION IMPACT ANALYSIS REPORT

APPROVED
By Carl Baughman at 4:26 pm, Jan 28, 2016

Applicant Name:	Crunk Engineering .	Applicant Name:	Epoch Residential .
Address:	1894 Gen. George Patton.	Address:	359 Carolina Avenue .
	Franklin, TN 37067 .		Winter Park, FL 32789 .
Phone #:	(615) 873-1795 .	Phone #:	(321) 316-6005 .
e-mail address:	adam@crunkeng.com .	e-mail address:	mccarley@epochresidential.com .

PROCESS OVERVIEW

A Transportation Impact Analysis shall be prepared by the Applicant's Consultant or the City's Traffic Consultant using the standard format specified by the Institute of Transportation Engineers in accordance with the following:

(i) The applicant shall submit a completed *Request for Transportation Impact Analysis Application Form* to the Engineering Department.

(ii) Scope of Services
   a. Following initial review of the application form, the Engineering Department shall prepare and submit a Scope of Services and schedule to the Applicant. If necessary a meeting will be scheduled to review and discuss the Scope of Services in detail.
   b. Following approval the applicant will pay the City 90% of the estimated cost of the traffic impact study. At the completion of the study the City shall reimburse the applicant all remaining fees.

(iii) Transportation impact analyses shall be prepared utilizing traffic data that are consistent with:
   a. The land use and density data as referenced in the most current edition of Trip Generation, published by the Institute of Transportation Engineers;
   b. Current city and state traffic counts for surrounding streets;
   c. Any additional traffic counts performed as a part of preparing the study.

Attachment A

City of Franklin Review Process for Transportation Impact Analysis

Step 1 – Preliminary discussion with Consultant/Developer on project description including site plan.
Step 2 – Scoping of Transportation Impact Analysis between the City of Franklin and Consultant/Developer.
Step 3 – Consultant, Traffic Engineer and Director of Engineering execute a MOU (Fees may apply per COF Ordinance 2015-64.
Step 4 – Consultant/Developer pays review fee and submits Transportation Impact Analysis.
Step 5 – City of Franklin prepares initial comments on the transportation impact analysis, if necessary.

Step 6 – Consultant submits corrections/revisions to the transportation impact analysis, if necessary.
Step 7 – City of Franklin prepares initial comments on proposed mitigation measures, if necessary
Step 8 – Consultant submits corrections/revisions on proposed mitigation measures, if necessary and electronic copy of the transportation impact analysis.
Step 9 – City of Franklin issues an assessment letter

Attachment B

Transportation Impact Analysis – Memorandum of Understanding (MOU)

This MOU acknowledges that the transportation impact analysis for the following project will be prepared in accordance with the latest version of City of Franklin Zoning Ordinance.

Project Name: Epoch Franklin .
Project Address: Oak Meadow Drive, east of S. Royal Oaks Boulevard .
Project Description: 352 apartments (240 units on north side, 112 apts on the south side) .

Attach a site map and a trip generation table with a description of the proposed land uses, ITE rates, estimated daily, morning, midday and afternoon peak hour volumes (ins/outs/totals), proposed trip credits, etc.

Project Buildout Year: 2018 Ambient or CMP Growth Rate: : 4 % Per Yr.

Study Intersections:

1. Oak Meadow Drive and Private Road for Home Depot / western project access	9. Oak Meadow Drive and the eastern project accesses
2. S. Royal Oaks Blvd and Oak Meadow Dr	10.
3. S. Royal Oaks Blvd and Center Point Pl / Riverside Dr	11.
4. Highway 96E and Royal Oaks Blvd (for data collection and signal timing purposes only)	12.
5. Highway 96E and Ramps for SB I-65(for data collection and signal timing purposes only)	13.
6. Highway 96E and Ramps for NB I-65(for data collection and signal timing purposes only)	14.

Trip Credits: (Exact amount of credit subject to approval by City of Franklin)

	Yes	No
Transit Usage		X
Existing Active Land Use		X
Previous Land Use		X
Internal Trip		X
Pass-By Trip		X

Exhibit B

Consultant:	FTG, LLC	Developer:	Epoch Residential
Address:	PO Box 682736	Address:	359 Carolina Avenue
	Franklin, TN 37068		Winter Park, FL 32789
Phone #:	(615) 771-8022	Phone #:	(321) 316-6005
e-mail address:	Gillian@FTGtraffic.com	e-mail address:	mccarley@epochresidential.com

Approved By: _____ _____

City of Franklin Traffic Engineer Director of Engineering

Reason for Request: (Planned Unit Development, Site Plan, Rezoning)

site plan

Description of Proposed Project (Address, Map/Parcel Number, etc.) (Attach a conceptual development plans showing all access points and adjacent streets.):

079 08800 00009079

079 10105 00109079

Existing Land Use (be specific):

undeveloped

Proposed Land Use (be specific):

240 apartments on 13.06 acres (north) and 112 apartments on 18.87 acres (south)

Potential Development Yield (number of residential units; building square footage, projected number of employees, hours of operations):

352 apartments

As applicant, I agree to pay to the City of Franklin 90% of the entire cost of the Transportation Impact Analysis.

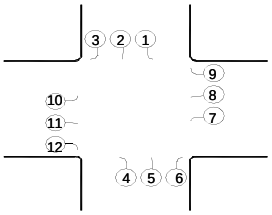
Property Owner Signature: _____

Property Owner Title: _____

Date: _____

The information above shall be submitted to the Engineering Department (109 3rd Ave South; Franklin, TN 37064) to review and provide estimated cost along with a proposed scope of services. All questions should be directed to Carl Baughman, Traffic Engineer III (615-791-3218).

APPENDIX B
EXISTING TRAFFIC COUNTS

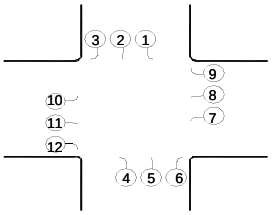


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Oak Meadow Dr and Eastern Home Depot Access
DATE: 23-Feb-16 Tue
RECORDER: FTG
NOTES: unsignalized

LOCATION	S/B Home Depot Access			N/B			W/B Oak Meadow Dr			E/B Oak Meadow Dr				
TIME	1	2	3	4	5	6	7	8	9	10	11	12		
6:30-6:45								24			7		209	31
6:45-7:00								**54**			**13**		**228**	**67**
7:00-7:15								**50**			**13**		209	63
7:15-7:30								**36**			**12**		189	48
7:30-7:45								**43**			**7**		179	50
7:45-8:00								41			7			48
8:00-8:15								33			10			43
8:15-8:30								29			9			38
4:30-4:45								**46**			**33**		**344**	79
4:45-5:00								**33**			**49**		336	82
5:00-5:15								**41**			**48**		346	89
5:15-5:30								**48**			**46**		329	**94**
5:30-5:45								33			38		309	71
5:45-6:00								34			58			92
6:00-6:15								25			47			72
6:15-6:30								32			42			74
TOTAL								**602**			**439**			
AM PK HR								183			45		**6:45-7:45**	
PM PK HR								168			176		**4:30-5:30**	

AM PK PHF								0.85			0.87		**0.85**
PM PK PHF								0.88			0.90		**0.91**

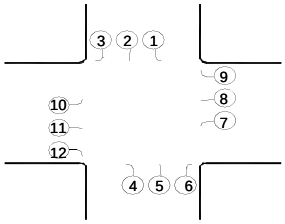


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Oak Meadow Dr and Western Home Depot Access
DATE: 23-Feb-16 Tue
RECORDER: FTG
NOTES: unsignalized

LOCATION	S/B Home Depot Access			N/B			W/B Oak Meadow Dr			E/B Oak Meadow Dr				
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**		
6:30-6:45			1					24			7		213	32
6:45-7:00								**54**			**13**		**231**	**67**
7:00-7:15								**50**		**1**	**13**		213	64
7:15-7:30			**1**					**36**		**1**	**12**		192	50
7:30-7:45	**1**							**43**			**6**		180	50
7:45-8:00								41		1	7			49
8:00-8:15	1							33			9			43
8:15-8:30								29			9			38
4:30-4:45	**3**							**46**		**1**	**30**		**351**	80
4:45-5:00	**4**							**33**		**1**	**45**		343	83
5:00-5:15	**3**		**1**					**40**	**1**	**2**	**45**		354	92
5:15-5:30	**5**		**1**					**47**	**1**	**1**	**41**		335	**96**
5:30-5:45	3							33		1	35		314	72
5:45-6:00	6							34		2	52			94
6:00-6:15	7							25		1	40			73
6:15-6:30	5							32		1	37			75
TOTAL	**38**		**4**					**600**	**2**	**13**	**401**			
AM PK HR	1		1					183		2	44		**6:45-7:45**	
PM PK HR	15		2					166	2	5	161		**4:30-5:30**	

AM PK PHF	0.25		0.25					0.85		0.50	0.85		**0.86**
PM PK PHF	0.75		0.50					0.88	0.50	0.63	0.89		**0.91**

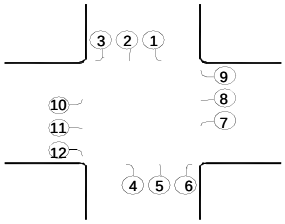


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Oak Meadow Dr
DATE: 4-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Oak Meadow Dr			E/B Oak Meadow Dr			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45	1	96	15	17	231	2	2	2	21	28	4	9	1,978
6:45-7:00	**4**	**88**	**17**	**17**	**270**	**7**	**1**	**4**	**49**	**31**	**2**	**12**	**2,078**
7:00-7:15	**6**	**115**	**15**	**14**	**300**	**6**	**5**	**2**	**43**	**26**	**2**	**16**	2,071
7:15-7:30	**9**	**117**	**15**	**23**	**242**	**4**	**4**		**33**	**34**		**17**	1,995
7:30-7:45	**3**	**157**	**21**	**27**	**225**	**3**	**7**	**8**	**28**	**28**		**21**	1,972
7:45-8:00	5	172	15	17	199	2	8	4	29	30	1	13	
8:00-8:15	3	123	22	22	214	4	8	8	17	29	2	22	
8:15-8:30	6	142	19	18	213	3	7	3	19	24		21	
4:30-4:45	**25**	**187**	**40**	**17**	**169**		**20**	**9**	**17**	**44**	**6**	**26**	**2,272**
4:45-5:00	**29**	**179**	**29**	**18**	**200**	**6**	**17**	**2**	**14**	**25**	**11**	**31**	2,225
5:00-5:15	**32**	**170**	**33**	**28**	**222**	**5**	**19**	**5**	**17**	**35**	**10**	**29**	2,170
5:15-5:30	**32**	**172**	**32**	**22**	**175**	**2**	**21**	**6**	**21**	**32**	**8**	**23**	2,016
5:30-5:45	27	150	29	16	188	4	14	3	16	33	5	28	1,932
5:45-6:00	33	158	33	8	162	11	12	7	15	35	10	22	
6:00-6:15	34	164	16	20	138	3	10	9	6	22	4	25	
6:15-6:30	33	175	18	9	148	1	17	6	9	23	4	19	
TOTAL	**282**	**2,365**	**369**	**293**	**3,296**	**63**	**172**	**78**	**354**	**479**	**69**	**334**	
AM PK HR	22	477	68	81	1,037	20	17	14	153	119	4	66	**6:45-7:45**
PM PK HR	118	708	134	85	766	13	77	22	69	136	35	109	**4:30-5:30**

AM PK PHF	0.61	0.76	0.81	0.75	0.86	0.71	0.61	0.44	0.78	0.88	0.50	0.79	**0.94**
PM PK PHF	0.92	0.95	0.84	0.76	0.86	0.54	0.92	0.61	0.82	0.77	0.80	0.88	**0.94**

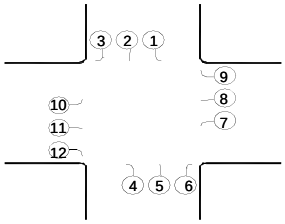


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Rand Place / Home Depot
DATE: 23-Feb-16 Tue
RECORDER: Burns
NOTES: unsignalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Home Depot Access			E/B Rand Place			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:30-6:45	13	93	10	3	279	11	2	1	2	6	1		1,934
6:45-7:00	**10**	**132**	**8**	**2**	**358**	**6**	**2**		**1**	**5**		**1**	**2,048**
7:00-7:15	**15**	**119**	**12**		**364**	**5**	**1**		**1**	**8**	**1**	**1**	2,029
7:15-7:30	**9**	**153**	**9**	**4**	**264**	**5**	**2**		**7**	**4**		**4**	1,968
7:30-7:45	**11**	**182**	**18**	**3**	**295**	**7**	**8**		**2**	**7**		**2**	1,986
7:45-8:00	6	188	6	4	279	9	3		5	2		4	
8:00-8:15	13	172	14	4	240	6	2	1	3	5		6	
8:15-8:30	11	123	11	7	307	7	2		4	7			
4:30-4:45	**5**	**207**	**19**	**1**	**218**	**5**	**11**		**6**	**8**	**1**	**4**	**2,005**
4:45-5:00	**5**	**211**	**27**	**1**	**209**	**3**	**3**		**8**	**6**	**1**	**6**	1,987
5:00-5:15	**5**	**228**	**26**	**2**	**235**	**4**	**4**	**3**	**3**	**5**		**2**	1,967
5:15-5:30	**5**	**237**	**25**	**2**	**234**	**4**	**1**	**1**	**5**	**5**	**1**	**3**	1,888
5:30-5:45	2	262	17	4	156	1	5	1	3	12		4	1,720
5:45-6:00	3	211	23	4	196	2	3	1	4	7		6	
6:00-6:15	3	213	18	2	168	3	5	1	4	12	2	7	
6:15-6:30	1	204	17	2	115	3	2			8		3	
TOTAL	**117**	**2,935**	**260**	**45**	**3,917**	**81**	**56**	**9**	**58**	**107**	**7**	**53**	
AM PK HR	45	586	47	9	1,281	23	13		11	24	1	8	**6:45-7:45**
PM PK HR	20	883	97	6	896	16	19	4	22	24	3	15	**4:30-5:30**

AM PK PHF	0.75	0.80	0.65	0.56	0.88	0.82	0.41		0.39	0.75	0.25	0.50	**0.97**
PM PK PHF	1.00	0.93	0.90	0.75	0.95	0.80	0.43	0.33	0.69	0.75	0.75	0.63	**0.96**

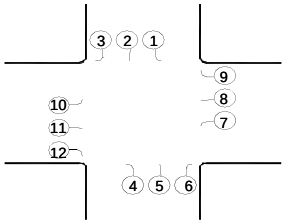


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Center Point Pl and Riverside Dr
DATE: 4-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Riverside Dr			E/B Cener Point Pl			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45	50	105	4	3	226	24	6	2	13	0	3	6	2,202
6:45-7:00	45	113	5	2	335	22	5	0	23	2	9	3	2,321
7:00-7:15	**63**	**130**	**4**	**3**	**306**	**22**	**4**	**4**	**26**	**0**	**7**	**10**	**2,378**
7:15-7:30	**59**	**161**	**8**	**7**	**297**	**30**	**10**	**4**	**20**	**0**	**14**	**7**	2,372
7:30-7:45	**63**	**158**	**4**	**8**	**253**	**16**	**12**	**2**	**21**	**3**	**12**	**9**	2,375
7:45-8:00	**62**	**220**	**7**	**8**	**244**	**27**	**5**	**1**	**22**	**3**	**10**	**12**	
8:00-8:15	74	161	8	7	232	19	11	3	33	4	14	7	
8:15-8:30	70	194	6	7	231	25	13	5	31	10	10	18	
4:30-4:45	**56**	**255**	**24**	**19**	**240**	**6**	**11**	**15**	**59**	**21**	**14**	**38**	**2,942**
4:45-5:00	**48**	**243**	**16**	**30**	**228**	**4**	**13**	**14**	**67**	**15**	**15**	**29**	2,865
5:00-5:15	**47**	**233**	**28**	**12**	**247**	**7**	**11**	**20**	**71**	**28**	**13**	**30**	2,829
5:15-5:30	**64**	**233**	**18**	**22**	**240**	**8**	**8**	**5**	**70**	**13**	**17**	**17**	2,730
5:30-5:45	60	223	25	14	221	9	8	8	47	15	29	22	2,571
5:45-6:00	55	206	23	20	228	13	6	7	52	25	22	29	
6:00-6:15	61	200	19	19	199	6	7	10	63	25	14	25	
6:15-6:30	37	184	21	17	166	6	11	10	33	25	17	29	
TOTAL	**914**	**3,019**	**220**	**198**	**3,893**	**244**	**141**	**110**	**651**	**189**	**220**	**291**	
AM PK HR	247	669	23	26	1,100	95	31	11	89	6	43	38	**7:00-8:00**
PM PK HR	215	964	86	83	955	25	43	54	267	77	59	114	**4:30-5:30**

AM PK PHF	0.98	0.76	0.72	0.81	0.90	0.79	0.65	0.69	0.86	0.50	0.77	0.79	**0.96**
PM PK PHF	0.84	0.95	0.77	0.69	0.97	0.78	0.83	0.68	0.94	0.69	0.87	0.75	**0.97**

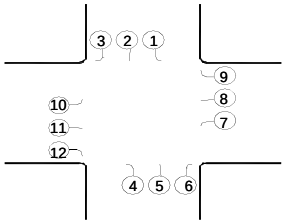


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Murfreesboro Road and Royal Oaks Blvd
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B N. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:30-6:45	21	26	8	14	38	211	99	137	37	4	118	7	3,669
6:45-7:00	29	17	4	24	80	244	123	193	43	15	168	8	4,005
7:00-7:15	48	27	5	28	119	253	107	159	37	20	166	13	4,252
7:15-7:30	51	25	14	22	53	236	160	204	57	21	163	13	4,384
7:30-7:45	**53**	**39**	**18**	**25**	**70**	**213**	**162**	**210**	**58**	**29**	**165**	**14**	**4,492**
7:45-8:00	**50**	**43**	**20**	**26**	**56**	**267**	**210**	**234**	**72**	**25**	**181**	**11**	
8:00-8:15	**53**	**36**	**19**	**14**	**48**	**205**	**193**	**249**	**61**	**23**	**202**	**11**	
8:15-8:30	**52**	**61**	**19**	**27**	**44**	**224**	**191**	**226**	**69**	**27**	**167**	**20**	
4:30-4:45	**71**	**94**	**37**	**28**	**90**	**220**	**195**	**284**	**54**	**45**	**238**	**15**	**5,614**
4:45-5:00	**67**	**103**	**47**	**32**	**78**	**213**	**198**	**252**	**61**	**50**	**275**	**17**	5,552
5:00-5:15	**78**	**90**	**39**	**38**	**74**	**235**	**222**	**272**	**60**	**41**	**267**	**12**	5,358
5:15-5:30	**77**	**107**	**42**	**33**	**73**	**205**	**217**	**279**	**74**	**55**	**246**	**14**	5,160
5:30-5:45	81	101	41	22	74	187	199	271	60	42	211	20	4,965
5:45-6:00	68	78	47	25	72	157	175	208	119	33	197	20	
6:00-6:15	80	89	44	32	65	169	169	234	60	42	229	17	
6:15-6:30	72	87	38	19	54	175	183	260	58	49	219	13	
TOTAL	**951**	**1,023**	**442**	**409**	**1,088**	**3,414**	**2,803**	**3,672**	**980**	**521**	**3,212**	**225**	
AM PK HR	208	179	76	92	218	909	756	919	260	104	715	56	**7:30-8:30**
PM PK HR	293	394	165	131	315	873	832	1,087	249	191	1,026	58	**4:30-5:30**

AM PK PHF	0.98	0.73	0.95	0.85	0.78	0.85	0.90	0.92	0.90	0.90	0.88	0.70	**0.94**
PM PK PHF	0.94	0.92	0.88	0.86	0.88	0.93	0.94	0.96	0.84	0.87	0.93	0.85	**0.98**

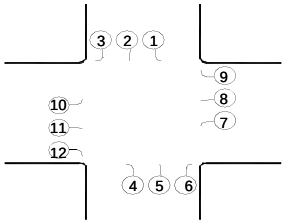


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Murfreesboro Road and the Ramps for Southbound I-65
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B Ramps			N/B			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45	63		148				11				369	34	2,929
6:45-7:00	69		181				31				406	47	3,112
7:00-7:15	66		139				30				471	49	3,159
7:15-7:30	**73**		**196**				**37**				**452**	**57**	**3,168**
7:30-7:45	**61**		**237**				**32**				**432**	**46**	3,140
7:45-8:00	**91**		**245**				**18**				**385**	**42**	
8:00-8:15	**86**		**219**				**29**				**385**	**45**	
8:15-8:30	91		240				24				393	39	
4:30-4:45	**205**		**299**				**71**				**480**	**114**	**4,656**
4:45-5:00	**222**		**322**				**48**				**388**	**95**	4,524
5:00-5:15	**197**		**298**				**76**				**470**	**119**	4,499
5:15-5:30	**222**		**374**				**69**				**469**	**118**	4,376
5:30-5:45	175		319				56				385	102	4,089
5:45-6:00	181		349				44				383	93	
6:00-6:15	196		290				43				408	100	
6:15-6:30	178		256				40				414	77	
TOTAL	**2,176**		**4,112**				**659**				**6,690**	**1,177**	
AM PK HR	311		897				116				1,654	190	**7:15-8:15**
PM PK HR	846		1,293				264				1,807	446	**4:30-5:30**

AM PK PHF	0.85		0.92				0.91				0.96	1.03	**0.97**
PM PK PHF	0.95		0.86				0.87				0.94	0.94	**0.93**



INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Murfreesboro Road and the Ramps for Northbound I-65
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B Ramps			N/B			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45				74		78		144	286	278			3,695
6:45-7:00				**109**		**94**		**150**	**306**	**319**			**3,772**
7:00-7:15				**65**		**66**		**183**	**306**	**331**			3,689
7:15-7:30				**94**		**92**		**154**	**267**	**299**			3,592
7:30-7:45				**107**		**85**		**213**	**248**	**284**			3,508
7:45-8:00				72		101		243	236	243			
8:00-8:15				108		82		182	223	259			
8:15-8:30				91		67		234	223	207			
4:30-4:45				**80**		**40**		**229**	**138**	**215**			**2,712**
4:45-5:00				**75**		**39**		**231**	**134**	**187**			2,597
5:00-5:15				**63**		**39**		**251**	**123**	**208**			2,490
5:15-5:30				**66**		**34**		**213**	**143**	**204**			2,376
5:30-5:45				49		40		200	105	193			2,230
5:45-6:00				79		46		161	101	172			
6:00-6:15				71		44		183	106	166			
6:15-6:30				52		44		176	89	153			
TOTAL				**1,255**		**991**		**1,503**	**3,034**	**3,718**			
AM PK HR				375		337		700	1,127	1,233			**6:45-7:45**
PM PK HR				284		152		814	924	538			**4:30-5:30**

AM PK PHF				0.86		0.90		0.82	0.92	0.93	#DIV/0!		**0.96**
PM PK PHF				0.89		0.95		0.95	0.92	0.94	#DIV/0!		**0.97**

APPENDIX C
CAPACITY ANALYSES

EXISTING CONDITIONS

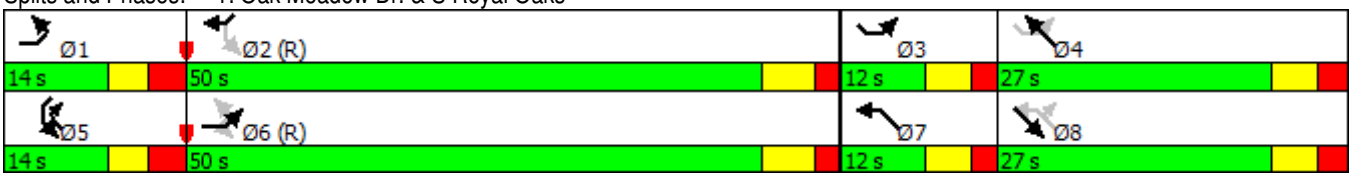
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	81	1037	20	119	4	66	17	14	153	22	477	68
Future Volume (vph)	81	1037	20	119	4	66	17	14	153	22	477	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.861				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1550	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.308	0.950		0.742			0.583			0.208		
Satd. Flow (perm)	497	3319	1531	1336	1550	0	1086	1925	1583	387	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		90				101		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	121	1103	32	151	7	90	23	24	166	29	636	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	1103	32	151	97	0	23	24	166	29	735	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	77.4	66.6	66.6	14.7	10.8		14.7	10.8	21.2	76.9	66.4	
Actuated g/C Ratio	0.75	0.65	0.65	0.14	0.10		0.14	0.10	0.21	0.75	0.64	
v/c Ratio	0.26	0.51	0.03	0.67	0.40		0.11	0.12	0.41	0.07	0.40	
Control Delay	5.3	12.0	0.1	54.1	15.7		34.1	42.2	16.9	4.5	8.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	5.3	12.0	0.1	54.1	15.7		34.1	42.2	16.9	4.5	8.6	
LOS	A	B	A	D	B		C	D	B	A	A	
Approach Delay		11.1			39.0			21.6		8.4		
Approach LOS		B			D			C		A		
90th %ile Green (s)	8.0	54.3	54.3	6.5	11.7		6.5	11.7	7.0	7.0	53.3	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.3	57.4	57.4	6.5	8.6		6.5	8.6	7.0	7.0	57.1	
70th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
50th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
50th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
30th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
30th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	72.0	72.0	6.5	0.0		0.0	0.0	7.0	7.0	72.0	
10th %ile Term Code	Min	Coord	Coord	Max	Skip		Skip	Skip	Min	Min	Coord	
Stops (vph)	21	538	0	110	17		15	14	53	7	205	
Fuel Used(gal)	1	10	0	2	1		0	0	2	0	9	
CO Emissions (g/hr)	39	697	6	172	50		26	24	140	24	628	
NOx Emissions (g/hr)	8	136	1	33	10		5	5	27	5	122	
VOC Emissions (g/hr)	9	162	1	40	12		6	6	32	5	146	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	10	145	0	100	4		14	15	35	2	71	
Queue Length 95th (ft)	32	308	0	120	13		27	25	88	12	130	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	482	2147	1044	224	423		214	439	420	433	1850	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.25	0.51	0.03	0.67	0.23		0.11	0.05	0.40	0.07	0.40	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 59.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	26	1100	95	247	669	23	6	43	38	31	11	89
Future Volume (vph)	26	1100	95	247	669	23	6	43	38	31	11	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.934			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1607	1787	3428	0	1754	1624	0	1787	1523	0
Flt Permitted	0.377			0.182			0.489			0.520		
Satd. Flow (perm)	665	3438	1607	342	3428	0	903	1624	0	978	1523	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82		5			30			103	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	41	1196	109	309	676	34	10	63	49	46	17	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	1196	109	309	710	0	10	112	0	46	120	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

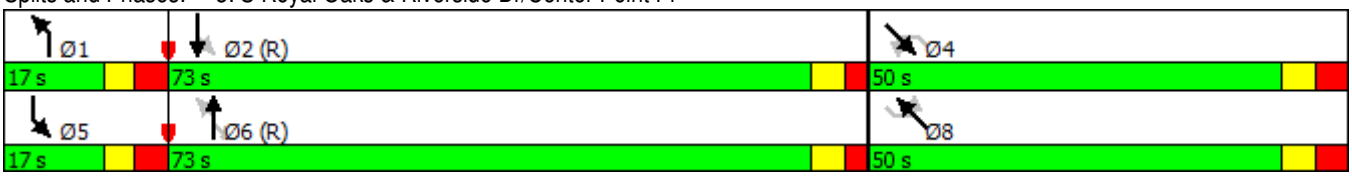
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (%)	12.1%	52.1%	52.1%	12.1%	52.1%		35.7%	35.7%		35.7%	35.7%	
Maximum Green (s)	10.5	67.0	67.0	10.5	67.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	105.1	99.9	99.9	112.9	106.2		15.6	15.6		15.6	15.6	
Actuated g/C Ratio	0.75	0.71	0.71	0.81	0.76		0.11	0.11		0.11	0.11	
v/c Ratio	0.07	0.49	0.09	0.78	0.27		0.10	0.54		0.43	0.46	
Control Delay	3.6	10.1	2.5	37.9	2.9		49.5	43.9		68.5	19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.6	10.1	2.5	37.9	2.9		49.5	43.9		68.5	19.4	
LOS	A	B	A	D	A		D	D		E	B	
Approach Delay		9.2			13.5			44.3			33.0	
Approach LOS		A			B			D			C	
90th %ile Green (s)	7.6	90.9	90.9	10.5	93.8		19.1	19.1		19.1	19.1	
90th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
70th %ile Green (s)	7.0	94.5	94.5	10.5	98.0		15.5	15.5		15.5	15.5	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
50th %ile Green (s)	6.6	96.9	96.9	10.5	100.8		13.1	13.1		13.1	13.1	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
30th %ile Green (s)	6.3	99.4	99.4	10.5	103.6		10.6	10.6		10.6	10.6	
30th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
10th %ile Green (s)	0.0	102.9	102.9	10.5	119.9		7.1	7.1		7.1	7.1	
10th %ile Term Code	Skip	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
Stops (vph)	6	463	9	181	127		7	63		28	22	
Fuel Used(gal)	0	19	1	4	5		0	2		1	1	
CO Emissions (g/hr)	27	1310	91	310	376		10	117		50	64	
NOx Emissions (g/hr)	5	255	18	60	73		2	23		10	12	
VOC Emissions (g/hr)	6	304	21	72	87		2	27		12	15	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	6	228	7	124	63		9	77		40	14	
Queue Length 95th (ft)	11	320	26	m161	m85		18	99		58	24	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	600	2453	1170	394	2601		293	548		317	564	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

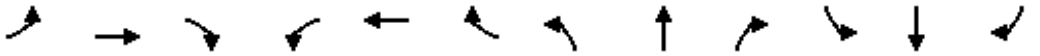
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.07	0.49	0.09	0.78	0.27		0.03	0.20		0.15	0.21	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 64.1%		ICU Level of Service C	
Analysis Period (min) 15			

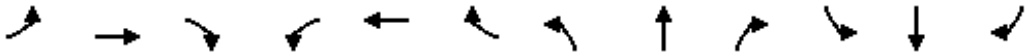
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	715	56	756	919	260	92	218	909	208	179	76
Future Volume (vph)	104	715	56	756	919	260	92	218	909	208	179	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3232	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3232	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				201					36	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	130	794	70	813	1010	295	112	273	977	226	242	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	864	0	813	1010	295	112	273	977	226	336	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

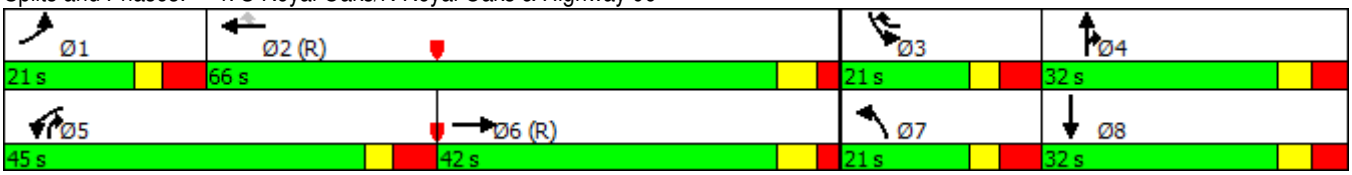


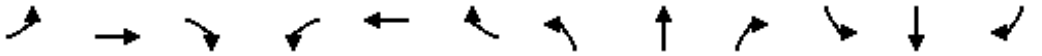
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.2	38.9		39.8	65.4	84.3	12.0	27.5	71.8	14.9	30.3	
Actuated g/C Ratio	0.09	0.28		0.28	0.47	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.40	0.66		0.87	0.63	0.28	0.39	0.38	0.67	0.64	0.46	
Control Delay	77.5	38.6		49.2	40.8	6.0	55.8	51.9	34.8	68.9	45.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	77.5	38.6		49.2	40.8	6.0	55.8	51.9	34.8	68.9	45.0	
LOS	E	D		D	D	A	E	D	C	E	D	
Approach Delay		43.7			39.2			40.0			54.6	
Approach LOS		D			D			D			D	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	12.9	24.5		13.5	25.1	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.0	35.5		37.5	61.0	13.5	11.2	24.5		13.5	26.8	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	10.8	35.5		37.5	62.2	13.5	10.0	24.5		13.5	28.0	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.6	35.9		37.5	63.8	13.1	8.9	24.5		13.1	28.7	
30th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
10th %ile Green (s)	7.8	39.4		36.4	68.0	10.7	7.2	24.5		10.7	28.0	
10th %ile Term Code	Gap	Coord		Gap	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	104	667		657	884	60	85	201	635	196	196	
Fuel Used(gal)	3	16		20	24	3	2	5	16	6	5	
CO Emissions (g/hr)	221	1137		1407	1661	210	146	333	1088	389	373	
NOx Emissions (g/hr)	43	221		274	323	41	28	65	212	76	73	
VOC Emissions (g/hr)	51	264		326	385	49	34	77	252	90	86	
Dilemma Vehicles (#)	0	26		0	34	0	0	0	0	0	0	
Queue Length 50th (ft)	63	260		352	503	50	50	128	322	103	125	
Queue Length 95th (ft)	88	310		m412	m539	m80	73	146	567	148	141	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1308		938	1591	1061	370	714	1473	367	728	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.34	0.66		0.87	0.63	0.28	0.30	0.38	0.66	0.62	0.46	

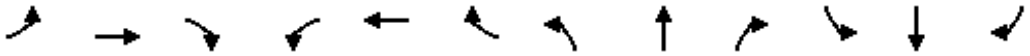
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 42.0		Intersection LOS: D	
Intersection Capacity Utilization 66.7%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1595	172	103	972	0	0	0	0	329	0	941
Future Volume (vph)	0	1595	172	103	972	0	0	0	0	329	0	941
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181									147
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1753	191	120	1117	0	0	0	0	387	0	1001
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1753	191	120	1117	0	0	0	0	387	0	1001
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



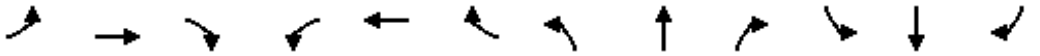
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.9	60.9	15.1	81.0					49.5		49.5
Actuated g/C Ratio		0.44	0.44	0.11	0.58					0.35		0.35
v/c Ratio		0.64	0.25	0.62	0.57					0.33		0.97
Control Delay		23.9	4.3	69.3	18.2					34.2		59.3
Queue Delay		0.1	0.0	0.0	0.3					1.2		0.0
Total Delay		24.0	4.3	69.3	18.5					35.3		59.3
LOS		C	A	E	B					D		E
Approach Delay		22.0			23.5							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		58.2	58.2	14.8	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		60.5	60.5	12.5	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.7	63.7	9.3	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		879	29	103	466					235		753
Fuel Used(gal)		29	2	3	12					6		21
CO Emissions (g/hr)		2048	128	199	828					397		1494
NOx Emissions (g/hr)		398	25	39	161					77		291
VOC Emissions (g/hr)		475	30	46	192					92		346
Dilemma Vehicles (#)		41	0	0	24					0		0
Queue Length 50th (ft)		231	16	116	273					132		451
Queue Length 95th (ft)		330	51	m156	m273					164		#617
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2759	758	229	1960					1162		1033
Starvation Cap Reductn		0	0	0	305					0		0
Spillback Cap Reductn		150	0	0	0					537		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.67	0.25	0.52	0.67					0.62		0.97

Intersection Summary

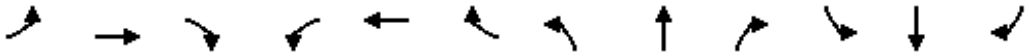
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 31.7		Intersection LOS: C	
Intersection Capacity Utilization 100.3%		ICU Level of Service G	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1233	691	0	0	700	1127	375	0	337	0	0	0
Future Volume (vph)	1233	691	0	0	700	1127	375	0	337	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			289			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1401	803	0	0	737	1150	395	0	366	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1401	803	0	0	737	1150	395	0	366	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.19	0.31			0.55	0.72	1.02		0.82			
Control Delay	144.4	2.7			35.6	24.7	109.7		29.7			
Queue Delay	0.3	0.1			0.0	0.0	0.0		0.0			
Total Delay	144.7	2.8			35.6	24.7	109.7		29.7			
LOS	F	A			D	C	F		C			
Approach Delay		93.0			28.9							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	894	79			533	785	332		80			
Fuel Used(gal)	50	4			12	16	12		4			
CO Emissions (g/hr)	3473	263			824	1101	827		301			
NOx Emissions (g/hr)	676	51			160	214	161		59			
VOC Emissions (g/hr)	805	61			191	255	192		70			
Dilemma Vehicles (#)	0	18			25	0	0		0			
Queue Length 50th (ft)	~756	47			273	409	~195		66			
Queue Length 95th (ft)	#913	71			337	502	#302		#225			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		446			
Starvation Cap Reductn	67	590			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.26	0.40			0.55	0.72	1.02		0.82			

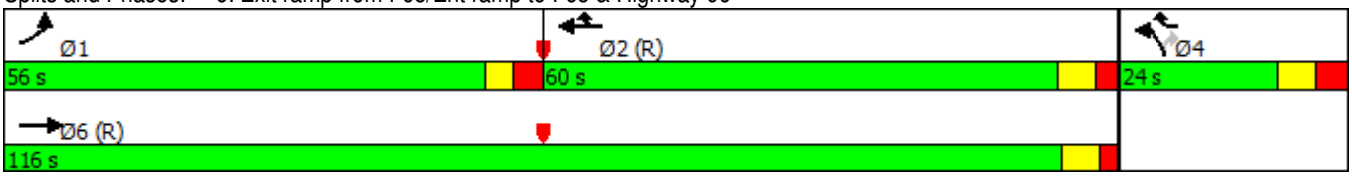
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.19			
Intersection Signal Delay: 64.7		Intersection LOS: E	
Intersection Capacity Utilization 100.3%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	85	766	13	136	35	109	77	22	69	118	708	134
Future Volume (vph)	85	766	13	136	35	109	77	22	69	118	708	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.893				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1608	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.128	0.950		0.732			0.317			0.294		
Satd. Flow (perm)	207	3319	1531	1318	1608	0	590	1925	1583	548	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		101				77		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	127	815	21	172	60	149	103	38	75	157	944	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	815	21	172	209	0	103	38	75	157	1138	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	80.5	67.8	67.8	29.4	17.1		28.2	16.3	30.6	76.9	65.9	
Actuated g/C Ratio	0.67	0.56	0.56	0.24	0.14		0.24	0.14	0.26	0.64	0.55	
v/c Ratio	0.47	0.43	0.02	0.46	0.66		0.42	0.15	0.16	0.35	0.72	
Control Delay	13.5	17.0	0.1	39.6	34.2		38.6	43.7	7.1	9.9	22.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	13.5	17.0	0.1	39.6	34.2		38.6	43.7	7.1	9.9	22.3	
LOS	B	B	A	D	C		D	D	A	A	C	
Approach Delay		16.2			36.6			28.6		20.8		
Approach LOS		B			D			C		C		
90th %ile Green (s)	12.0	57.5	57.5	8.5	22.5		8.5	22.5	8.0	8.0	53.5	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	11.6	62.2	62.2	8.5	17.8		8.5	17.8	8.0	8.0	58.6	
70th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	9.2	65.9	65.9	8.5	14.5		8.5	14.5	7.6	7.6	64.3	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Gap	Gap	Coord	
30th %ile Green (s)	7.0	70.2	70.2	25.3	11.2		8.1	0.0	7.0	7.0	70.2	
30th %ile Term Code	Min	Coord	Coord	Hold	Gap		Gap	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	75.5	75.5	20.0	7.0		7.0	0.0	7.0	7.0	75.5	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Min	Skip	Min	Min	Coord	
Stops (vph)	29	432	0	111	70		58	19	10	44	562	
Fuel Used(gal)	1	8	0	2	2		2	1	1	2	18	
CO Emissions (g/hr)	53	583	4	165	151		116	36	44	138	1229	
NOx Emissions (g/hr)	10	113	1	32	29		23	7	9	27	239	
VOC Emissions (g/hr)	12	135	1	38	35		27	8	10	32	285	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	31	180	0	109	79		63	26	0	38	318	
Queue Length 95th (ft)	47	268	0	137	63		82	35	33	64	356	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	302	1874	921	377	496		248	505	467	460	1590	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.42	0.43	0.02	0.46	0.42		0.42	0.08	0.16	0.34	0.72	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 21.9	Intersection LOS: C
Intersection Capacity Utilization 56.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	83	955	25	215	964	86	77	59	114	43	54	267
Future Volume (vph)	83	955	25	215	964	86	77	59	114	43	54	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.986			0.906			0.877	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1575	1805	3444	0	1736	1672	0	1752	1595	0
Flt Permitted	0.192			0.198			0.147			0.385		
Satd. Flow (perm)	339	3438	1575	376	3444	0	269	1672	0	710	1595	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		12			57			159	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	105	1005	39	287	1071	113	90	83	139	57	61	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	1005	39	287	1184	0	90	222	0	57	345	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	70.0	70.0	30.0	85.0		50.0	50.0		50.0	50.0	
Total Split (s)	14.0	72.0	72.0	29.0	87.0		49.0	49.0		49.0	49.0	
Total Split (%)	9.3%	48.0%	48.0%	19.3%	58.0%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	94.1	88.3	88.3	107.0	96.6		32.0	32.0		32.0	32.0	
Actuated g/C Ratio	0.63	0.59	0.59	0.71	0.64		0.21	0.21		0.21	0.21	
v/c Ratio	0.37	0.50	0.04	0.67	0.53		1.58	0.55		0.38	0.74	
Control Delay	13.2	21.7	0.1	26.3	3.4		363.3	32.8		54.2	37.7	
Queue Delay	0.0	0.0	0.0	0.0	0.3		0.0	0.0		0.0	0.0	
Total Delay	13.2	21.7	0.1	26.3	3.7		363.3	32.8		54.2	37.7	
LOS	B	C	A	C	A		F	C		D	D	
Approach Delay		20.2			8.1			128.1			40.0	
Approach LOS		C			A			F			D	
90th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
70th %ile Green (s)	7.5	73.1	73.1	20.4	86.0		37.0	37.0		37.0	37.0	
70th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
50th %ile Green (s)	7.5	84.8	84.8	15.1	92.4		30.6	30.6		30.6	30.6	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
30th %ile Green (s)	7.5	94.9	94.9	11.6	99.0		24.0	24.0		24.0	24.0	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
10th %ile Green (s)	6.6	107.5	107.5	8.9	109.8		14.1	14.1		14.1	14.1	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
Stops (vph)	34	560	0	149	255		56	115		35	165	
Fuel Used(gal)	1	19	0	3	9		7	3		1	5	
CO Emissions (g/hr)	102	1356	22	231	603		460	215		59	326	
NOx Emissions (g/hr)	20	264	4	45	117		89	42		11	63	
VOC Emissions (g/hr)	24	314	5	54	140		107	50		14	76	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	29	292	0	101	33		~122	118		48	174	
Queue Length 95th (ft)	55	464	0	m91	m161		#214	141		70	255	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	288	2022	977	494	2222		79	536		210	585	
Starvation Cap Reductn	0	0	0	0	423		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.36	0.50	0.04	0.58	0.66		1.14	0.41		0.27	0.59	

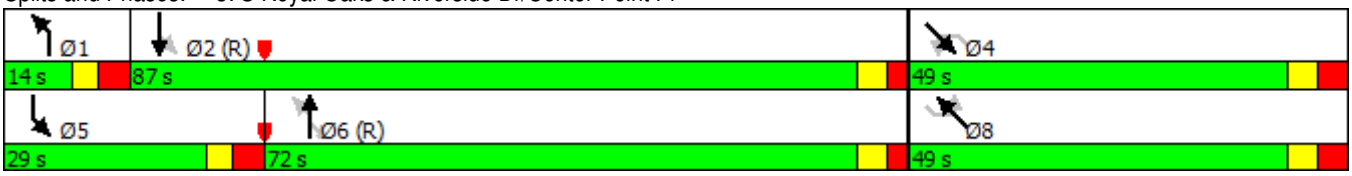
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 123 (82%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.58			
Intersection Signal Delay: 27.4		Intersection LOS: C	
Intersection Capacity Utilization 78.9%		ICU Level of Service D	
Analysis Period (min) 15			

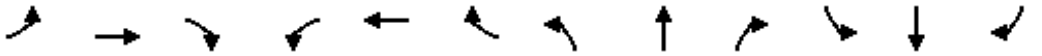
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

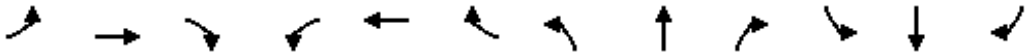
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	1026	58	832	1087	249	131	315	873	293	394	165
Future Volume (vph)	191	1026	58	832	1087	249	131	315	873	293	394	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.950	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3315	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3315	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				106					51	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	208	1103	72	956	1195	280	177	380	981	353	415	206
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	1175	0	956	1195	280	177	380	981	353	621	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

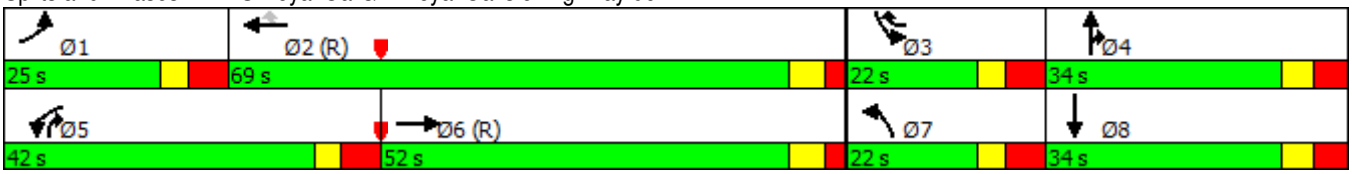


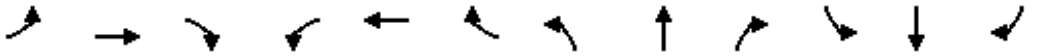
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	16.7	48.0		37.0	68.3	88.8	14.5	29.5	71.0	16.5	31.5	
Actuated g/C Ratio	0.11	0.32		0.25	0.46	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.54	0.74		1.16	0.74	0.27	0.53	0.52	0.72	0.95	0.84	
Control Delay	68.8	41.9		119.7	46.5	14.5	65.6	61.5	39.5	100.9	63.9	
Queue Delay	0.0	0.0		0.0	0.5	0.0	0.1	0.0	0.0	0.0	0.0	
Total Delay	68.8	41.9		119.7	46.9	14.5	65.7	61.5	39.5	100.9	63.9	
LOS	E	D		F	D	B	E	E	D	F	E	
Approach Delay		45.9			71.8			47.9			77.3	
Approach LOS		D			E			D			E	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	15.9	45.5		34.5	64.1	14.5	14.4	26.5		14.5	26.6	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	14.4	45.5		34.5	65.6	14.5	12.9	26.5		14.5	28.1	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	12.8	45.5		34.5	67.2	14.5	11.5	26.5		14.5	29.5	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	10.5	45.5		34.5	69.5	14.5	9.4	26.5		14.5	31.6	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	177	770		714	982	166	124	280	638	266	474	
Fuel Used(gal)	5	22		34	29	4	3	7	16	10	14	
CO Emissions (g/hr)	372	1535		2378	2008	306	227	520	1114	677	985	
NOx Emissions (g/hr)	72	299		463	391	60	44	101	217	132	192	
VOC Emissions (g/hr)	86	356		551	465	71	53	120	258	157	228	
Dilemma Vehicles (#)	0	41		0	37	0	0	0	0	0	0	
Queue Length 50th (ft)	100	266		~580	551	113	85	202	283	179	287	
Queue Length 95th (ft)	m144	336		m#499	m492	m120	m103	m218	m617	#242	#398	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1610	1021	383	730	1369	372	735	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	1		0	114	0	9	0	0	0	1	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.45	0.74		1.16	0.80	0.27	0.47	0.52	0.72	0.95	0.85	

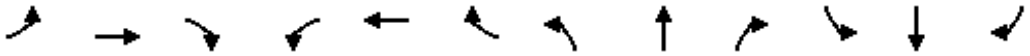
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 61.2		Intersection LOS: E	
Intersection Capacity Utilization 81.9%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1807	446	264	834	0	0	0	0	846	0	1293
Future Volume (vph)	0	1807	446	264	834	0	0	0	0	846	0	1293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			405									177
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	1943	572	372	970	0	0	0	0	972	0	1469
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1943	572	372	970	0	0	0	0	972	0	1469
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.89	0.71	1.25	0.52					0.71		1.24
Control Delay		63.2	26.8	190.8	21.8					41.5		151.8
Queue Delay		0.0	0.0	0.0	0.3					0.2		0.0
Total Delay		63.2	26.8	190.8	22.1					41.8		151.8
LOS		E	C	F	C					D		F
Approach Delay		54.9			68.9							
Approach LOS		D			E							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1693	363	205	393					695		956
Fuel Used(gal)		54	10	13	11					16		53
CO Emissions (g/hr)		3809	671	927	748					1134		3733
NOx Emissions (g/hr)		741	131	180	146					221		726
VOC Emissions (g/hr)		883	156	215	173					263		865
Dilemma Vehicles (#)		108	0	0	34					0		0
Queue Length 50th (ft)		565	221	~464	239					409		~953
Queue Length 95th (ft)		m609	265	#465	337					465		#1065
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	805	297	1865					1368		1180
Starvation Cap Reductn		0	0	0	353					0		0
Spillback Cap Reductn		0	0	0	0					57		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.89	0.71	1.25	0.64					0.74		1.24

Intersection Summary

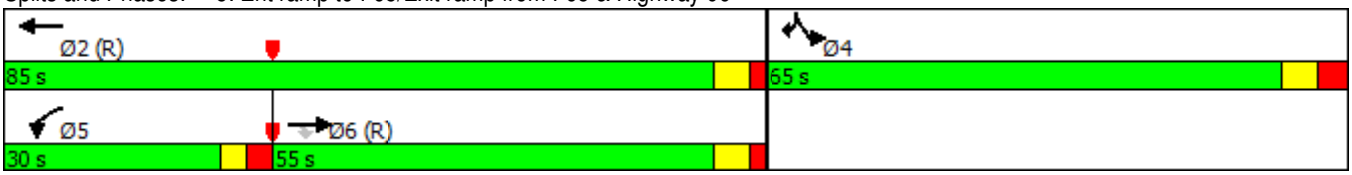
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 78.4		Intersection LOS: E	
Intersection Capacity Utilization 79.1%		ICU Level of Service D	
Analysis Period (min) 15			

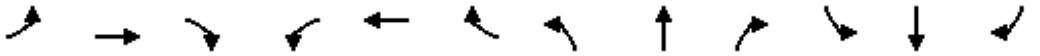
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

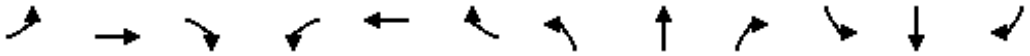
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	538	2115	0	0	814	924	284	0	152	0	0	0
Future Volume (vph)	538	2115	0	0	814	924	284	0	152	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						301			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	555	2158	0	0	895	994	309	0	175	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	555	2158	0	0	895	994	309	0	175	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

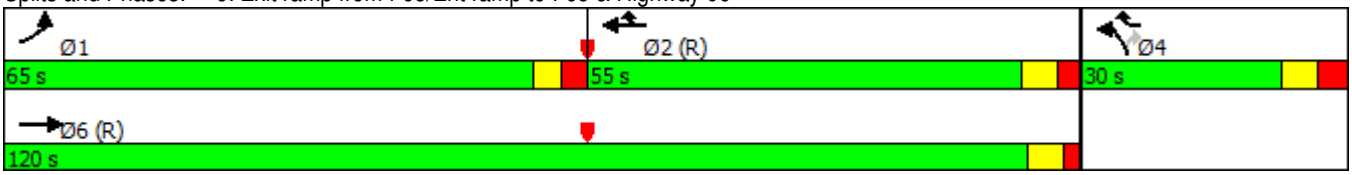


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	33.1	115.2			75.6	106.4	21.3		21.3			
Actuated g/C Ratio	0.22	0.77			0.50	0.71	0.14		0.14			
v/c Ratio	0.77	0.83			0.50	0.48	0.66		0.61			
Control Delay	78.2	19.8			27.0	7.5	68.0		45.7			
Queue Delay	0.0	1.5			0.0	0.0	0.0		0.0			
Total Delay	78.2	21.3			27.0	7.5	68.0		45.7			
LOS	E	C			C	A	E		D			
Approach Delay		33.0			16.8							
Approach LOS		C			B							
90th %ile Green (s)	40.9	114.0			66.6		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	36.1	114.0			71.4		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	33.3	114.0			74.2		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	29.6	114.7			78.6		21.8		21.8			
30th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
10th %ile Green (s)	25.4	119.3			87.4		17.2		17.2			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	537	1521			532	278	266		86			
Fuel Used(gal)	16	31			20	16	7		3			
CO Emissions (g/hr)	1110	2200			1390	1099	462		184			
NOx Emissions (g/hr)	216	428			270	214	90		36			
VOC Emissions (g/hr)	257	510			322	255	107		43			
Dilemma Vehicles (#)	0	77			27	0	0		0			
Queue Length 50th (ft)	297	362			305	150	148		97			
Queue Length 95th (ft)	m341	370			406	234	201		172			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2588			1784	2085	495		298			
Starvation Cap Reductn	0	244			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.43	0.92			0.50	0.48	0.62		0.59			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 29.5		Intersection LOS: C	
Intersection Capacity Utilization 79.1%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



HCS 2010 Two-Way Stop Control Summary Report

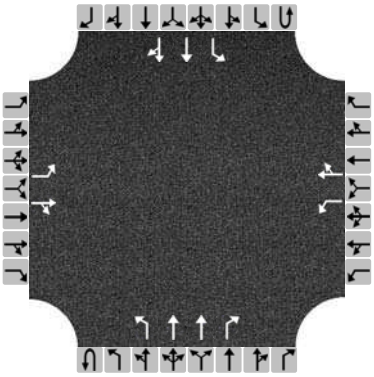
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Existing)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		24	1	8		13	0	11		9	1281	23		45	586	47
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		25		9		13		11		9				46		
Capacity		203		461		130		410		944				519		
v/c Ratio		0.12		0.02		0.10		0.03		0.01				0.09		
95% Queue Length		0.4		0.1		0.3		0.1		0.0				0.3		
Control Delay (s/veh)		25.2		13.0		35.8		14.0		8.8				12.6		
Level of Service (LOS)		D		B		E		B		A				B		
Approach Delay (s/veh)	21.9				25.8				0.1				0.8			
Approach LOS	C				D				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

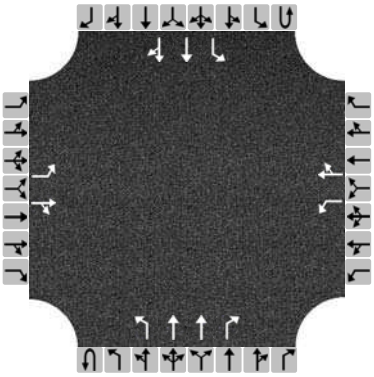
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Existing)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		24	3	15		19	4	22		6	896	16		20	883	97
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		25		19		20		27		6				21		
Capacity		183		391		199		411		688				731		
v/c Ratio		0.14		0.05		0.10		0.07		0.01				0.03		
95% Queue Length		0.5		0.2		0.3		0.2		0.0				0.1		
Control Delay (s/veh)		27.7		14.7		25.1		14.4		10.3				10.1		
Level of Service (LOS)		D		B		D		B		B				B		
Approach Delay (s/veh)	22.1				18.9				0.1				0.2			
Approach LOS	C				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

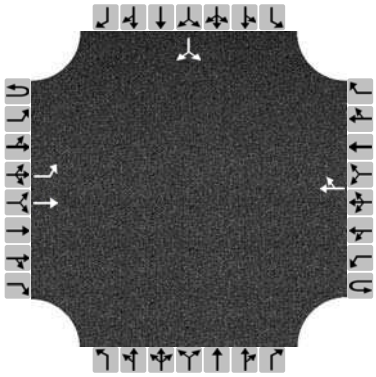
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Existing)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		2	44				183	0						1		1
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		2													2	
Capacity		1351													761	
v/c Ratio		0.00													0.00	
95% Queue Length		0.0													0.0	
Control Delay (s/veh)		7.7													9.7	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.3												9.7			
Approach LOS	A												A			

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HCS 2010 Two-Way Stop Control Summary Report

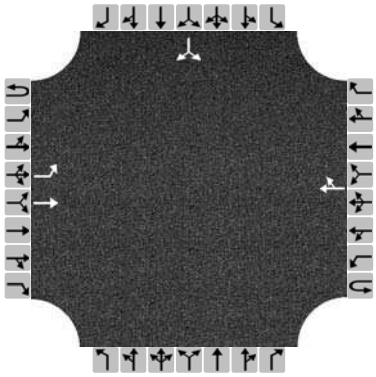
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Existing)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		5	161				166	2						15		2
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		6													21	
Capacity		1373													660	
v/c Ratio		0.00													0.03	
95% Queue Length		0.0													0.1	
Control Delay (s/veh)		7.6													10.6	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.2												10.6			
Approach LOS	A												B			

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BACKGROUND CONDITIONS

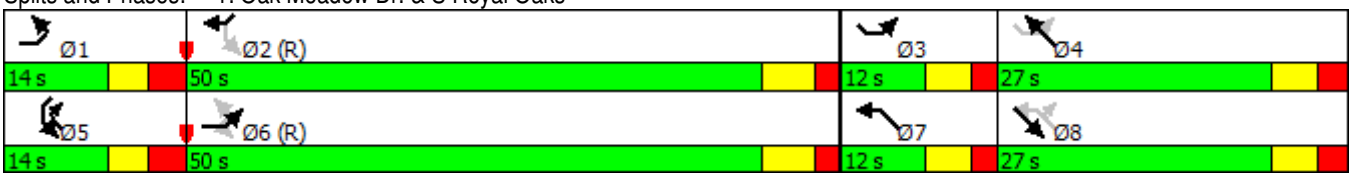
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	29	129	7	71	21	16	170	36	515	73
Future Volume (vph)	87	1120	29	129	7	71	21	16	170	36	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.867				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1561	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.278	0.950		0.739			0.540			0.177		
Satd. Flow (perm)	449	3319	1531	1331	1561	0	1006	1925	1583	330	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		97				90		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	46	163	12	97	28	28	185	48	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1191	46	163	109	0	28	28	185	48	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	74.6	63.7	63.7	17.0	11.1		17.0	11.1	24.1	73.9	63.4	
Actuated g/C Ratio	0.72	0.62	0.62	0.17	0.11		0.17	0.11	0.23	0.72	0.62	
v/c Ratio	0.30	0.58	0.05	0.64	0.43		0.12	0.14	0.42	0.13	0.45	
Control Delay	6.5	14.4	0.1	48.7	16.3		32.2	42.1	19.9	5.6	10.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	6.5	14.4	0.1	48.7	16.3		32.2	42.1	19.9	5.6	10.3	
LOS	A	B	A	D	B		C	D	B	A	B	
Approach Delay		13.2			35.7			23.9		10.0		
Approach LOS		B			D			C		A		
90th %ile Green (s)	8.0	53.7	53.7	6.5	12.3		6.5	12.3	7.0	7.0	52.7	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.6	57.0	57.0	6.5	9.0		6.5	9.0	7.0	7.0	56.4	
70th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
50th %ile Green (s)	7.0	58.5	58.5	6.5	7.5		6.5	7.5	7.0	7.0	58.5	
50th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
30th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
30th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
Stops (vph)	25	656	0	116	19		17	15	74	11	250	
Fuel Used(gal)	1	12	0	3	1		0	0	2	1	10	
CO Emissions (g/hr)	44	821	9	176	57		30	27	173	39	703	
NOx Emissions (g/hr)	9	160	2	34	11		6	5	34	8	137	
VOC Emissions (g/hr)	10	190	2	41	13		7	6	40	9	163	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	23	246	0	93	7		15	17	52	8	125	
Queue Length 95th (ft)	35	351	0	127	15		30	27	110	18	147	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	438	2054	1006	254	431		232	439	453	386	1775	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.30	0.58	0.05	0.64	0.25		0.12	0.06	0.41	0.12	0.45	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	28	1198	103	267	747	25	6	46	41	33	12	96
Future Volume (vph)	28	1198	103	267	747	25	6	46	41	33	12	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.934			0.872	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1607	1787	3428	0	1754	1624	0	1787	1524	0
Flt Permitted	0.341			0.156			0.460			0.497		
Satd. Flow (perm)	602	3438	1607	293	3428	0	849	1624	0	935	1524	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82		5			30			112	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	44	1302	118	334	755	37	10	68	53	49	19	112
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1302	118	334	792	0	10	121	0	49	131	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

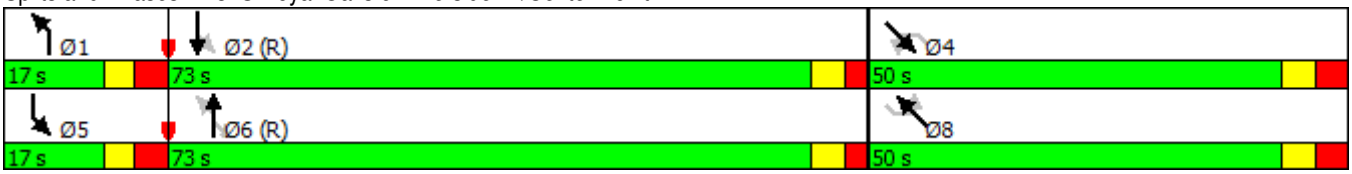
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (%)	12.1%	52.1%	52.1%	12.1%	52.1%		35.7%	35.7%		35.7%	35.7%	
Maximum Green (s)	10.5	67.0	67.0	10.5	67.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	104.4	99.1	99.1	112.1	105.4		16.4	16.4		16.4	16.4	
Actuated g/C Ratio	0.75	0.71	0.71	0.80	0.75		0.12	0.12		0.12	0.12	
v/c Ratio	0.09	0.53	0.10	0.94	0.31		0.10	0.56		0.45	0.47	
Control Delay	3.9	11.1	2.9	57.5	4.9		52.5	47.4		69.1	18.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.9	11.1	2.9	57.5	4.9		52.5	47.4		69.1	18.8	
LOS	A	B	A	E	A		D	D		E	B	
Approach Delay		10.2			20.5			47.8			32.5	
Approach LOS		B			C			D			C	
90th %ile Green (s)	7.7	89.8	89.8	10.5	92.6		20.2	20.2		20.2	20.2	
90th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
70th %ile Green (s)	7.1	93.6	93.6	10.5	97.0		16.4	16.4		16.4	16.4	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
50th %ile Green (s)	6.7	96.1	96.1	10.5	99.9		13.9	13.9		13.9	13.9	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
30th %ile Green (s)	6.3	98.7	98.7	10.5	102.9		11.3	11.3		11.3	11.3	
30th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
10th %ile Green (s)	0.0	102.4	102.4	10.5	119.4		7.6	7.6		7.6	7.6	
10th %ile Term Code	Skip	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
Stops (vph)	7	543	11	209	252		7	68		30	24	
Fuel Used(gal)	0	21	1	6	7		0	2		1	1	
CO Emissions (g/hr)	29	1459	100	414	485		10	130		53	69	
NOx Emissions (g/hr)	6	284	19	81	94		2	25		10	13	
VOC Emissions (g/hr)	7	338	23	96	112		2	30		12	16	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	6	267	9	156	75		9	83		42	16	
Queue Length 95th (ft)	12	374	31	m#192	m228		18	114		60	24	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	553	2434	1161	357	2581		275	548		303	570	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

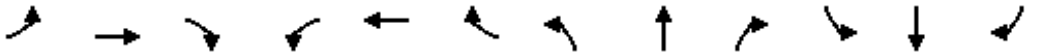
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.08	0.53	0.10	0.94	0.31		0.04	0.22		0.16	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 17.3		Intersection LOS: B	
Intersection Capacity Utilization 68.1%		ICU Level of Service C	
Analysis Period (min) 15			

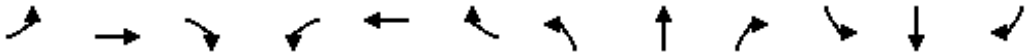
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	831	993	281	99	239	988	225	202	82
Future Volume (vph)	112	772	60	831	993	281	99	239	988	225	202	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3235	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3235	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				173					34	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	894	1091	319	121	299	1062	245	273	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	894	1091	319	121	299	1062	245	374	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

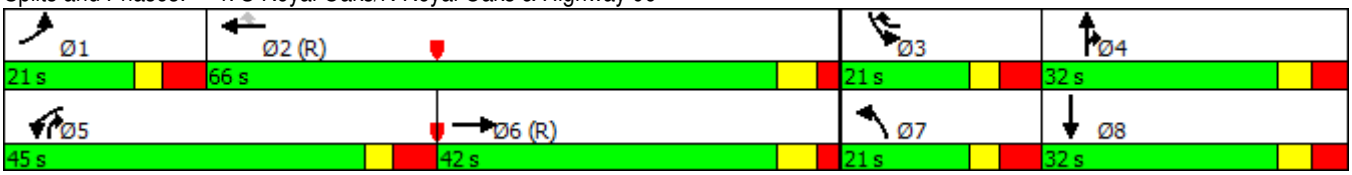


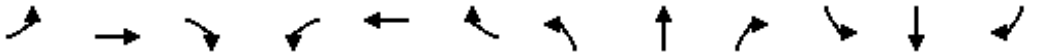
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.5	38.4		40.0	64.9	84.0	12.4	27.5	72.0	15.1	30.2	
Actuated g/C Ratio	0.10	0.27		0.29	0.46	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.43	0.72		0.95	0.69	0.31	0.41	0.42	0.72	0.69	0.52	
Control Delay	76.9	41.3		57.0	40.9	7.8	54.7	49.3	39.6	70.7	47.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	76.9	41.3		57.0	40.9	7.8	54.7	49.3	39.6	70.7	47.1	
LOS	E	D		E	D	A	D	D	D	E	D	
Approach Delay		45.9			42.6			42.8			56.4	
Approach LOS		D			D			D			E	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	13.3	24.5		13.5	24.7	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.4	35.5		37.5	60.6	13.5	11.6	24.5		13.5	26.4	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	11.2	35.5		37.5	61.8	13.5	10.4	24.5		13.5	27.6	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.9	35.5		37.5	63.1	13.5	9.2	24.5		13.5	28.8	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	8.1	37.6		37.5	67.0	11.4	7.5	24.5		11.4	28.4	
10th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	110	737		736	955	86	92	218	750	214	225	
Fuel Used(gal)	3	18		24	26	4	2	5	18	6	6	
CO Emissions (g/hr)	235	1271		1650	1796	249	155	355	1273	427	427	
NOx Emissions (g/hr)	46	247		321	349	48	30	69	248	83	83	
VOC Emissions (g/hr)	55	295		382	416	58	36	82	295	99	99	
Dilemma Vehicles (#)	0	28		0	36	0	0	0	0	0	0	
Queue Length 50th (ft)	69	284		409	535	65	55	140	395	112	144	
Queue Length 95th (ft)	93	338		m435	m554	m109	78	153	655	159	159	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1293		938	1578	1045	370	714	1473	367	724	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.72		0.95	0.69	0.31	0.33	0.42	0.72	0.67	0.52	

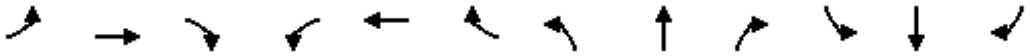
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 44.9		Intersection LOS: D	
Intersection Capacity Utilization 70.5%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1728	187	111	1055	0	0	0	0	355	0	1026
Future Volume (vph)	0	1728	187	111	1055	0	0	0	0	355	0	1026
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182									117
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1899	208	129	1213	0	0	0	0	418	0	1091
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1899	208	129	1213	0	0	0	0	418	0	1091
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.5	60.5	15.5	81.0					49.5		49.5
Actuated g/C Ratio		0.43	0.43	0.11	0.58					0.35		0.35
v/c Ratio		0.69	0.28	0.65	0.62					0.36		1.08
Control Delay		25.9	4.8	71.1	19.1					34.6		89.4
Queue Delay		0.5	0.0	0.0	0.3					2.1		0.0
Total Delay		26.3	4.8	71.1	19.4					36.7		89.4
LOS		C	A	E	B					D		F
Approach Delay		24.2			24.3							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		57.6	57.6	15.4	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		59.8	59.8	13.2	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.2	63.2	9.8	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		1020	34	111	500					256		827
Fuel Used(gal)		33	2	3	13					6		30
CO Emissions (g/hr)		2313	142	218	908					431		2069
NOx Emissions (g/hr)		450	28	42	177					84		403
VOC Emissions (g/hr)		536	33	50	211					100		480
Dilemma Vehicles (#)		50	0	0	33					0		0
Queue Length 50th (ft)		295	20	125	282					144		~586
Queue Length 95th (ft)		388	m50	m163	m294					178		#738
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2743	755	229	1960					1162		1014
Starvation Cap Reductn		0	0	0	217					0		0
Spillback Cap Reductn		376	0	0	0					581		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.80	0.28	0.56	0.70					0.72		1.08

Intersection Summary

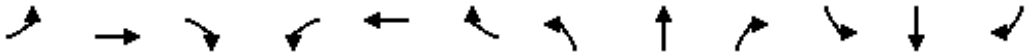
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 39.6	Intersection LOS: D
Intersection Capacity Utilization 107.3%	ICU Level of Service G
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

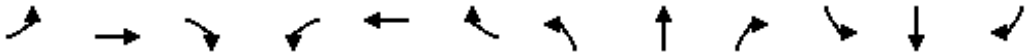
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1336	747	0	0	759	1217	407	0	364	0	0	0
Future Volume (vph)	1336	747	0	0	759	1217	407	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			258			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1518	869	0	0	799	1242	428	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1518	869	0	0	799	1242	428	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.29	0.33			0.59	0.77	1.10		0.95			
Control Delay	186.0	3.2			36.7	27.0	131.0		53.3			
Queue Delay	0.7	0.1			0.0	0.0	0.0		0.0			
Total Delay	186.7	3.3			36.7	27.0	131.0		53.3			
LOS	F	A			D	C	F		D			
Approach Delay		119.9			30.8							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	979	101			591	899	348		115			
Fuel Used(gal)	65	4			13	18	15		7			
CO Emissions (g/hr)	4561	300			914	1264	1018		455			
NOx Emissions (g/hr)	887	58			178	246	198		89			
VOC Emissions (g/hr)	1057	70			212	293	236		105			
Dilemma Vehicles (#)	0	17			27	0	0		0			
Queue Length 50th (ft)	~899	68			303	468	~227		135			
Queue Length 95th (ft)	#1028	76			372	573	#337		#341			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		419			
Starvation Cap Reductn	163	612			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.49	0.44			0.59	0.77	1.10		0.95			

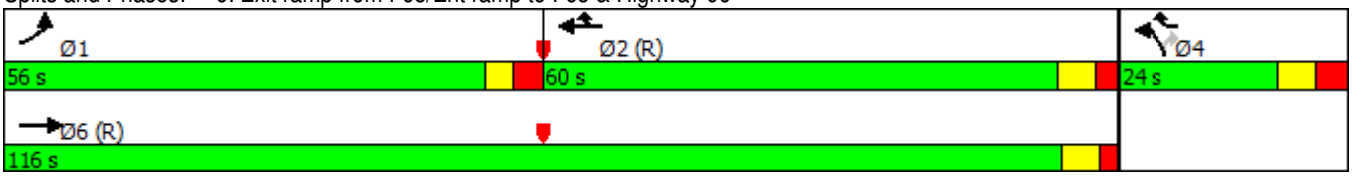
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 81.2		Intersection LOS: F	
Intersection Capacity Utilization 107.3%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	19	147	41	118	92	29	91	138	765	145
Future Volume (vph)	92	827	19	147	41	118	92	29	91	138	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.896				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1613	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.097	0.950		0.724			0.278			0.265		
Satd. Flow (perm)	157	3319	1531	1304	1613	0	518	1925	1583	494	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		93				99		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	30	186	71	162	123	50	99	184	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	880	30	186	233	0	123	50	99	184	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	78.4	65.3	65.3	31.2	19.4		30.6	19.1	33.0	74.3	63.1	
Actuated g/C Ratio	0.65	0.54	0.54	0.26	0.16		0.26	0.16	0.28	0.62	0.53	
v/c Ratio	0.56	0.49	0.03	0.48	0.69		0.51	0.16	0.20	0.45	0.80	
Control Delay	22.4	19.3	0.1	38.4	38.0		39.3	41.7	6.4	12.4	27.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	22.4	19.3	0.1	38.4	38.0		39.3	41.7	6.4	12.4	27.4	
LOS	C	B	A	D	D		D	D	A	B	C	
Approach Delay		19.1			38.2			27.8		25.5		
Approach LOS		B			D			C		C		
90th %ile Green (s)	12.0	54.9	54.9	8.5	25.1		8.5	25.1	8.0	8.0	50.9	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	59.7	59.7	8.5	20.3		8.5	20.3	8.0	8.0	55.7	
70th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	10.3	63.1	63.1	8.5	16.9		8.5	16.9	8.0	8.0	60.8	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
30th %ile Green (s)	7.7	67.2	67.2	8.5	13.5		8.5	13.5	7.3	7.3	66.8	
30th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Gap	Gap	Coord	
10th %ile Green (s)	7.0	73.9	73.9	21.6	8.6		7.0	0.0	7.0	7.0	73.9	
10th %ile Term Code	Min	Coord	Coord	Hold	Gap		Min	Skip	Min	Min	Coord	
Stops (vph)	40	507	0	118	89		69	23	12	56	640	
Fuel Used(gal)	1	10	0	3	3		2	1	1	2	20	
CO Emissions (g/hr)	72	671	6	175	178		139	46	56	168	1408	
NOx Emissions (g/hr)	14	131	1	34	35		27	9	11	33	274	
VOC Emissions (g/hr)	17	156	1	41	41		32	11	13	39	326	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	36	211	0	116	103		74	34	0	49	395	
Queue Length 95th (ft)	56	308	0	142	80		92	41	37	78	423	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	270	1804	892	385	492		248	505	512	418	1528	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.51	0.49	0.03	0.48	0.47		0.50	0.10	0.19	0.44	0.80	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 25.3	Intersection LOS: C
Intersection Capacity Utilization 60.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	90	1063	27	232	1063	93	83	64	123	46	58	288
Future Volume (vph)	90	1063	27	232	1063	93	83	64	123	46	58	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.986			0.906			0.877	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1575	1805	3444	0	1736	1672	0	1752	1595	0
Flt Permitted	0.156			0.144			0.168			0.392		
Satd. Flow (perm)	275	3438	1575	274	3444	0	307	1672	0	723	1595	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		12			57			158	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	114	1119	42	309	1181	122	97	90	150	61	66	306
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1119	42	309	1303	0	97	240	0	61	372	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	70.0	70.0	30.0	85.0		50.0	50.0		50.0	50.0	
Total Split (s)	14.0	72.0	72.0	29.0	87.0		49.0	49.0		49.0	49.0	
Total Split (%)	9.3%	48.0%	48.0%	19.3%	58.0%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	86.2	80.3	80.3	103.3	92.2		36.4	36.4		36.4	36.4	
Actuated g/C Ratio	0.57	0.54	0.54	0.69	0.61		0.24	0.24		0.24	0.24	
v/c Ratio	0.49	0.61	0.05	0.78	0.61		1.31	0.53		0.35	0.73	
Control Delay	18.9	28.2	0.1	40.9	7.1		246.3	34.1		49.9	37.3	
Queue Delay	0.0	0.0	0.0	0.0	1.1		0.0	0.0		0.0	0.0	
Total Delay	18.9	28.2	0.1	40.9	8.2		246.3	34.1		49.9	37.3	
LOS	B	C	A	D	A		F	C		D	D	
Approach Delay		26.4			14.5			95.2			39.1	
Approach LOS		C			B			F			D	
90th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
70th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
70th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
50th %ile Green (s)	7.5	70.5	70.5	22.5	85.5		37.5	37.5		37.5	37.5	
50th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Hold		Hold	Gap	
30th %ile Green (s)	7.5	82.8	82.8	17.8	93.1		29.9	29.9		29.9	29.9	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
10th %ile Green (s)	6.8	101.4	101.4	10.8	105.4		18.3	18.3		18.3	18.3	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
Stops (vph)	41	735	0	224	525		67	124		37	188	
Fuel Used(gal)	2	24	0	5	12		5	3		1	5	
CO Emissions (g/hr)	120	1651	24	322	819		360	236		60	353	
NOx Emissions (g/hr)	23	321	5	63	159		70	46		12	69	
VOC Emissions (g/hr)	28	383	6	75	190		83	55		14	82	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	37	427	0	146	64		~113	157		48	193	
Queue Length 95th (ft)	59	538	0	m112	m351		#217	170		74	289	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	237	1841	900	429	2121		91	536		214	584	
Starvation Cap Reductn	0	0	0	0	527		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.48	0.61	0.05	0.72	0.82		1.07	0.45		0.29	0.64	

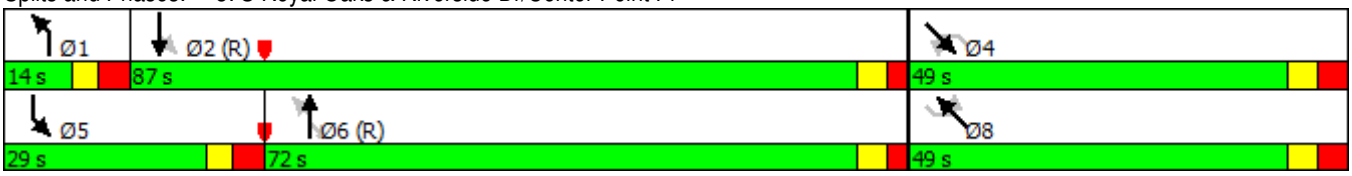
Intersection Summary		
Area Type:	Other	
Cycle Length: 150		
Actuated Cycle Length: 150		
Offset: 123 (82%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.31		
Intersection Signal Delay: 29.0	Intersection LOS: C	
Intersection Capacity Utilization 84.3%	ICU Level of Service E	
Analysis Period (min) 15		

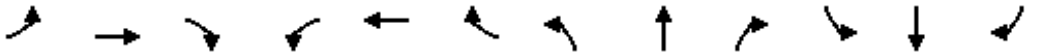
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

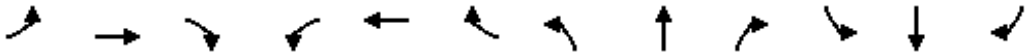
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	913	1174	269	141	351	964	316	434	178
Future Volume (vph)	206	1108	63	913	1174	269	141	351	964	316	434	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.951	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3319	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3319	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					49	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1049	1290	302	191	423	1083	381	457	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1049	1290	302	191	423	1083	381	680	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

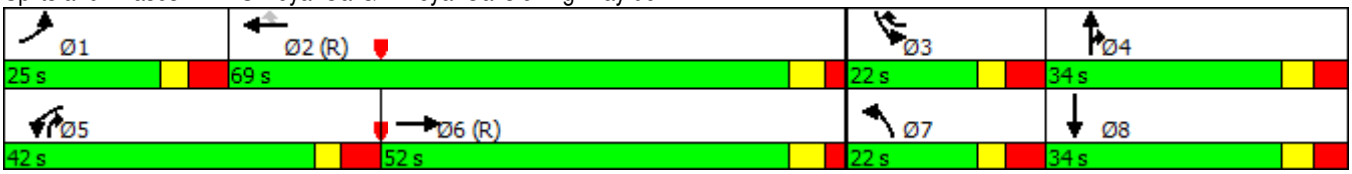


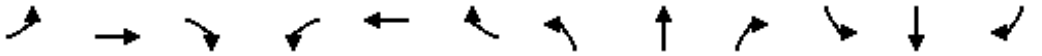
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.27	0.81	0.30	0.55	0.58	0.79	1.02	0.94	
Control Delay	68.7	44.7		163.5	48.8	16.5	60.9	58.9	49.2	117.0	74.6	
Queue Delay	0.0	0.2		0.2	0.6	0.0	0.1	0.0	0.0	0.0	0.3	
Total Delay	68.7	44.9		163.7	49.4	16.5	61.1	58.9	49.2	117.0	74.9	
LOS	E	D		F	D	B	E	E	D	F	E	
Approach Delay		48.5			91.1			53.0			90.0	
Approach LOS		D			F			D			F	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	16.7	45.5		34.5	63.3	14.5	14.5	26.5		14.5	26.5	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)	15.1	45.5		34.5	64.9	14.5	13.5	26.5		14.5	27.5	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	13.4	45.5		34.5	66.6	14.5	12.0	26.5		14.5	29.0	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	11.1	45.5		34.5	68.9	14.5	9.8	26.5		14.5	31.2	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	191	937		743	1069	205	134	321	787	280	514	
Fuel Used(gal)	6	25		45	32	5	3	8	20	11	17	
CO Emissions (g/hr)	401	1777		3150	2214	356	235	570	1395	800	1171	
NOx Emissions (g/hr)	78	346		613	431	69	46	111	271	156	228	
VOC Emissions (g/hr)	93	412		730	513	83	54	132	323	185	271	
Dilemma Vehicles (#)	0	44		0	44	0	0	0	0	0	0	
Queue Length 50th (ft)	107	315		~680	582	137	94	220	490	~203	327	
Queue Length 95th (ft)	155	369		m#521	m521	m130	m109	m236	m692	#272	#465	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	727	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	34		29	84	0	10	0	0	0	2	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.82		1.32	0.85	0.30	0.51	0.58	0.79	1.02	0.94	

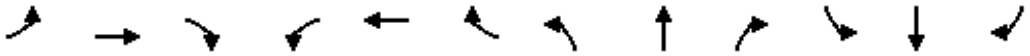
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.27			
Intersection Signal Delay: 72.3		Intersection LOS: E	
Intersection Capacity Utilization 87.4%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1971	484	285	906	0	0	0	0	914	0	1405
Future Volume (vph)	0	1971	484	285	906	0	0	0	0	914	0	1405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			403									143
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2119	621	401	1053	0	0	0	0	1051	0	1597
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2119	621	401	1053	0	0	0	0	1051	0	1597
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.97	0.77	1.35	0.56					0.77		1.38
Control Delay		69.9	30.6	226.6	25.0					43.9		207.9
Queue Delay		0.8	0.0	0.0	0.7					1.7		0.0
Total Delay		70.7	30.6	226.6	25.7					45.6		207.9
LOS		E	C	F	C					D		F
Approach Delay		61.6			81.1							
Approach LOS		E			F							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1855	462	222	472					776		985
Fuel Used(gal)		62	11	16	13					18		74
CO Emissions (g/hr)		4349	802	1147	886					1262		5163
NOx Emissions (g/hr)		846	156	223	172					246		1005
VOC Emissions (g/hr)		1008	186	266	205					292		1197
Dilemma Vehicles (#)		105	0	0	45					0		0
Queue Length 50th (ft)		619	296	~524	272					457		~1127
Queue Length 95th (ft)		m#672	m295	#520	407					515		#1235
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	804	297	1865					1368		1160
Starvation Cap Reductn		0	0	0	446					0		0
Spillback Cap Reductn		14	0	0	0					166		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.98	0.77	1.35	0.74					0.87		1.38

Intersection Summary

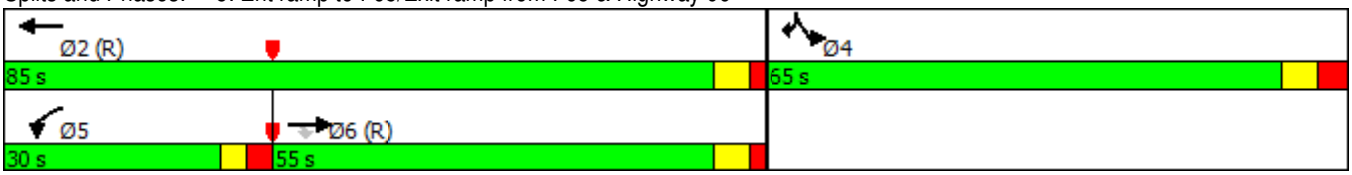
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.38			
Intersection Signal Delay: 97.4		Intersection LOS: F	
Intersection Capacity Utilization 84.7%		ICU Level of Service E	
Analysis Period (min) 15			

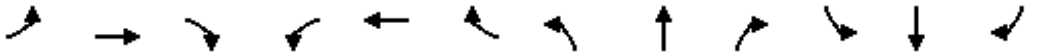
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

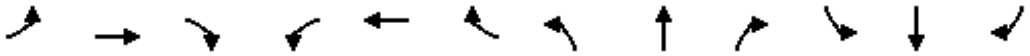
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	595	2290	0	0	882	998	309	0	164	0	0	0
Future Volume (vph)	595	2290	0	0	882	998	309	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						246			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	613	2337	0	0	969	1073	336	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	613	2337	0	0	969	1073	336	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

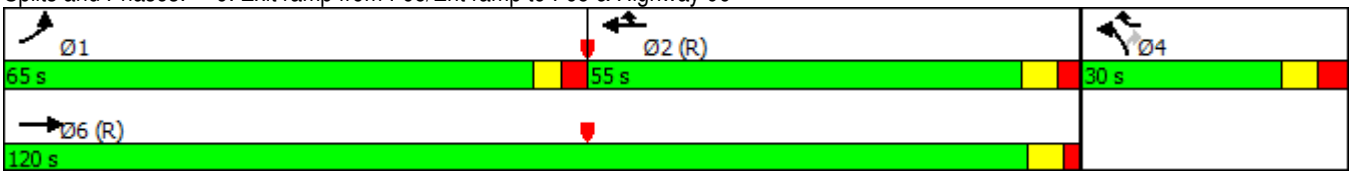


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	35.9	114.7			72.3	103.6	21.8		21.8			
Actuated g/C Ratio	0.24	0.76			0.48	0.69	0.15		0.15			
v/c Ratio	0.78	0.91			0.57	0.54	0.70		0.65			
Control Delay	79.7	23.8			30.4	10.0	69.4		49.0			
Queue Delay	0.0	4.8			0.0	0.0	0.0		0.0			
Total Delay	79.7	28.6			30.4	10.0	69.4		49.0			
LOS	E	C			C	B	E		D			
Approach Delay		39.2			19.7							
Approach LOS		D			B							
90th %ile Green (s)	43.9	114.0			63.6		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	39.0	114.0			68.5		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	36.0	114.0			71.5		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	33.0	114.0			74.5		22.5		22.5			
30th %ile Term Code	Gap	Coord			Coord		Max		Max			
10th %ile Green (s)	27.8	117.5			83.2		19.0		19.0			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	588	1844			621	375	290		100			
Fuel Used(gal)	18	38			23	18	7		3			
CO Emissions (g/hr)	1236	2645			1580	1273	509		208			
NOx Emissions (g/hr)	240	515			307	248	99		40			
VOC Emissions (g/hr)	286	613			366	295	118		48			
Dilemma Vehicles (#)	0	83			29	0	0		0			
Queue Length 50th (ft)	329	582			353	205	162		112			
Queue Length 95th (ft)	m340	m518			467	311	218		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2577			1704	2012	495		298			
Starvation Cap Reductn	0	197			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.48	0.98			0.57	0.53	0.68		0.63			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 34.2		Intersection LOS: C	
Intersection Capacity Utilization 84.7%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



HCS 2010 Two-Way Stop Control Summary Report

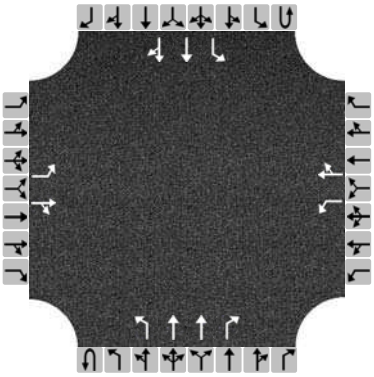
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Background)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	1	9		14	0	17		10	1388	25		61	645	51
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		10		14		18		10				63		
Capacity		165		416		108		377		893				470		
v/c Ratio		0.16		0.02		0.13		0.05		0.01				0.13		
95% Queue Length		0.6		0.1		0.4		0.1		0.0				0.5		
Control Delay (s/veh)		31.0		13.9		43.1		15.0		9.1				13.8		
Level of Service (LOS)		D		B		E		C		A				B		
Approach Delay (s/veh)	26.4				27.3				0.1				1.1			
Approach LOS	D				D				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

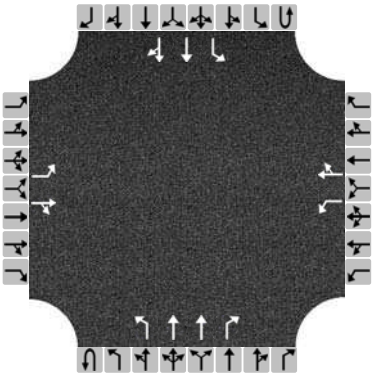
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Background)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	3	16		21	4	40		6	984	17		33	965	105
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		20		22		46		6				34		
Capacity		150		355		170		419		635				675		
v/c Ratio		0.18		0.06		0.13		0.11		0.01				0.05		
95% Queue Length		0.6		0.2		0.4		0.4		0.0				0.2		
Control Delay (s/veh)		34.1		15.7		29.2		14.7		10.7				10.6		
Level of Service (LOS)		D		C		D		B		B				B		
Approach Delay (s/veh)	26.3				19.4				0.1				0.3			
Approach LOS	D				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

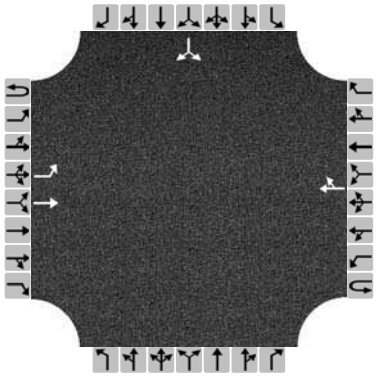
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Background)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		24	48				198	0						1		9
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		30													12	
Capacity		1330													782	
v/c Ratio		0.02													0.02	
95% Queue Length		0.1													0.0	
Control Delay (s/veh)		7.8													9.7	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	2.6												9.7			
Approach LOS	A												A			

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HCS 2010 Two-Way Stop Control Summary Report

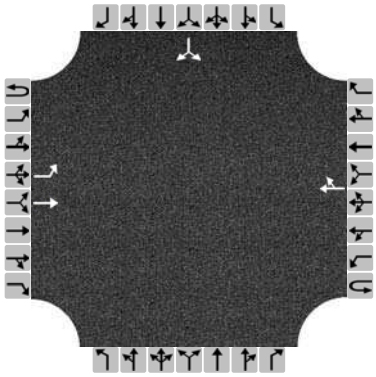
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Background)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		24	174				179	2						16		33
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		30													61	
Capacity		1355													726	
v/c Ratio		0.02													0.08	
95% Queue Length		0.1													0.3	
Control Delay (s/veh)		7.7													10.4	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.9												10.4			
Approach LOS	A												B			

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TOTAL PROJECTED CONDITIONS

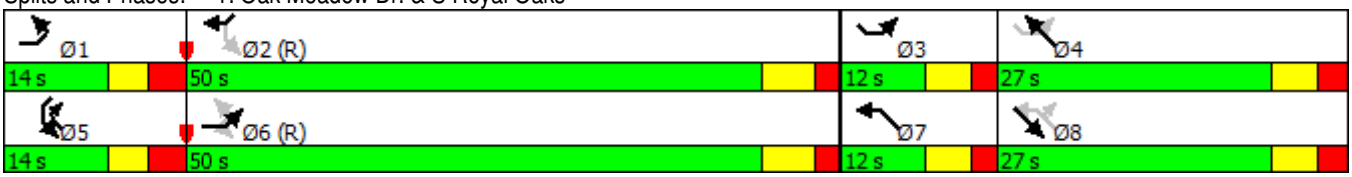
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Future Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.885				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1594	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.271	0.950		0.715			0.495			0.170		
Satd. Flow (perm)	437	3319	1531	1287	1594	0	922	1925	1583	317	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		97				90		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	92	163	29	97	87	64	249	75	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1191	92	163	126	0	87	64	249	75	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	71.0	60.1	60.1	20.0	12.3		20.0	12.3	25.3	70.3	59.8	
Actuated g/C Ratio	0.69	0.58	0.58	0.19	0.12		0.19	0.12	0.25	0.68	0.58	
v/c Ratio	0.32	0.61	0.10	0.57	0.46		0.34	0.28	0.55	0.21	0.47	
Control Delay	7.7	16.8	0.5	41.9	18.6		34.8	43.6	25.6	7.0	11.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.7	16.8	0.5	41.9	18.6		34.8	43.6	25.6	7.0	11.8	
LOS	A	B	A	D	B		C	D	C	A	B	
Approach Delay		14.9			31.7			30.5		11.4		
Approach LOS		B			C			C		B		
90th %ile Green (s)	8.0	52.3	52.3	6.5	13.7		6.5	13.7	7.0	7.0	51.3	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.8	55.3	55.3	6.5	10.7		6.5	10.7	7.0	7.0	54.5	
70th %ile Term Code	Gap	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
50th %ile Green (s)	7.0	56.6	56.6	6.5	9.4		6.5	9.4	7.0	7.0	56.6	
50th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
30th %ile Green (s)	7.0	57.9	57.9	6.5	8.1		6.5	8.1	7.0	7.0	57.9	
30th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
10th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
Stops (vph)	27	714	1	112	27		51	33	126	18	271	
Fuel Used(gal)	1	13	0	2	1		1	1	4	1	10	
CO Emissions (g/hr)	46	880	18	162	68		96	62	270	62	724	
NOx Emissions (g/hr)	9	171	4	32	13		19	12	52	12	141	
VOC Emissions (g/hr)	11	204	4	38	16		22	14	63	14	168	
Dilemma Vehicles (#)	0	0	0	0	0		0	2	0	0	0	
Queue Length 50th (ft)	25	258	0	91	17		46	39	90	14	131	
Queue Length 95th (ft)	37	362	0	124	22		69	48	161	26	152	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	415	1937	957	287	438		253	439	470	367	1681	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.31	0.61	0.10	0.57	0.29		0.34	0.15	0.53	0.20	0.47	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Future Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.934			0.868	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1607	1787	3428	0	1754	1624	0	1787	1520	0
Flt Permitted	0.332			0.138			0.368			0.497		
Satd. Flow (perm)	586	3438	1607	260	3428	0	679	1624	0	935	1520	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82		5			30			137	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	44	1387	118	343	778	37	10	68	53	49	19	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1387	118	343	815	0	10	121	0	49	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (%)	12.1%	52.1%	52.1%	12.1%	52.1%		35.7%	35.7%		35.7%	35.7%	
Maximum Green (s)	10.5	67.0	67.0	10.5	67.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	104.4	99.1	99.1	112.1	105.4		16.4	16.4		16.4	16.4	
Actuated g/C Ratio	0.75	0.71	0.71	0.80	0.75		0.12	0.12		0.12	0.12	
v/c Ratio	0.09	0.57	0.10	1.03	0.32		0.13	0.56		0.45	0.52	
Control Delay	3.9	11.7	2.9	80.0	6.7		55.7	49.1		69.1	18.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.9	11.7	2.9	80.0	6.7		55.7	49.1		69.1	18.2	
LOS	A	B	A	F	A		E	D		E	B	
Approach Delay		10.8			28.4			49.6			30.4	
Approach LOS		B			C			D			C	
90th %ile Green (s)	7.7	89.8	89.8	10.5	92.6		20.2	20.2		20.2	20.2	
90th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
70th %ile Green (s)	7.1	93.6	93.6	10.5	97.0		16.4	16.4		16.4	16.4	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
50th %ile Green (s)	6.7	96.1	96.1	10.5	99.9		13.9	13.9		13.9	13.9	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
30th %ile Green (s)	6.3	98.7	98.7	10.5	102.9		11.3	11.3		11.3	11.3	
30th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
10th %ile Green (s)	0.0	102.4	102.4	10.5	119.4		7.6	7.6		7.6	7.6	
10th %ile Term Code	Skip	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
Stops (vph)	7	603	11	227	286		7	68		30	26	
Fuel Used(gal)	0	23	1	7	8		0	2		1	1	
CO Emissions (g/hr)	29	1574	100	518	529		11	132		53	80	
NOx Emissions (g/hr)	6	306	19	101	103		2	26		10	16	
VOC Emissions (g/hr)	7	365	23	120	123		2	31		12	19	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	6	296	9	~180	83		9	82		42	16	
Queue Length 95th (ft)	12	414	31	m#181	m343		18	114		60	21	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	542	2434	1161	333	2581		220	548		303	586	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.08	0.57	0.10	1.03	0.32		0.05	0.22		0.16	0.27	

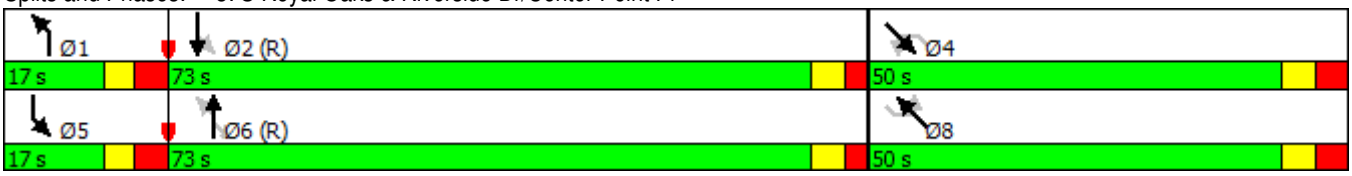
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 20.5		Intersection LOS: C	
Intersection Capacity Utilization 70.6%		ICU Level of Service C	
Analysis Period (min) 15			

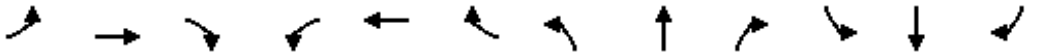
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

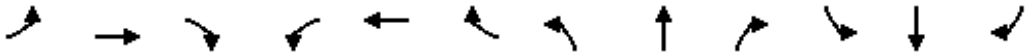
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Future Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				149					31	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	914	1091	319	121	340	1134	245	288	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	914	1091	319	121	340	1134	245	389	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

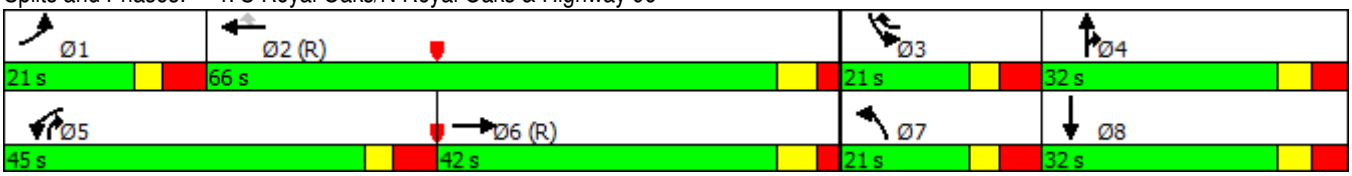


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.5	38.4		40.0	64.9	84.0	12.4	27.5	72.0	15.1	30.2	
Actuated g/C Ratio	0.10	0.27		0.29	0.46	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.43	0.72		0.97	0.69	0.31	0.41	0.48	0.77	0.69	0.54	
Control Delay	76.9	41.3		61.0	40.4	8.7	54.2	48.5	43.0	70.7	48.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	76.9	41.3		61.0	40.4	8.7	54.2	48.5	43.0	70.7	48.2	
LOS	E	D		E	D	A	D	D	D	E	D	
Approach Delay		45.9			44.1			45.0			56.9	
Approach LOS		D			D			D			E	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	13.3	24.5		13.5	24.7	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.4	35.5		37.5	60.6	13.5	11.6	24.5		13.5	26.4	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	11.2	35.5		37.5	61.8	13.5	10.4	24.5		13.5	27.6	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.9	35.5		37.5	63.1	13.5	9.2	24.5		13.5	28.8	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	8.1	37.6		37.5	67.0	11.4	7.5	24.5		11.4	28.4	
10th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	110	736		759	947	98	92	248	849	214	238	
Fuel Used(gal)	3	18		25	25	4	2	6	20	6	6	
CO Emissions (g/hr)	235	1270		1740	1782	261	155	401	1428	427	449	
NOx Emissions (g/hr)	46	247		338	347	51	30	78	278	83	87	
VOC Emissions (g/hr)	55	294		403	413	60	36	93	331	99	104	
Dilemma Vehicles (#)	0	28		0	36	0	0	0	0	0	0	
Queue Length 50th (ft)	69	284		419	535	78	54	156	475	112	153	
Queue Length 95th (ft)	93	338		m#446	m544	m122	76	174	696	159	167	
Internal Link Dist (ft)		620			611			712			884	

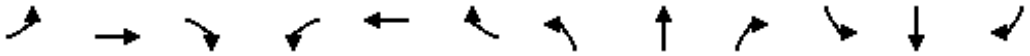
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1293		938	1578	1035	370	714	1473	367	723	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.72		0.97	0.69	0.31	0.33	0.48	0.77	0.67	0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 46.1		Intersection LOS: D	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Future Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			184									115
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.5	60.5	15.5	81.0					49.5		49.5
Actuated g/C Ratio		0.43	0.43	0.11	0.58					0.35		0.35
v/c Ratio		0.72	0.29	0.65	0.62					0.36		1.09
Control Delay		26.6	4.9	71.8	19.3					34.6		94.9
Queue Delay		0.8	0.0	0.0	0.3					2.1		0.0
Total Delay		27.3	4.9	71.8	19.5					36.7		94.9
LOS		C	A	E	B					D		F
Approach Delay		25.1			24.5							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		57.6	57.6	15.4	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		59.8	59.8	13.2	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.2	63.2	9.8	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		1114	37	111	497					256		836
Fuel Used(gal)		35	2	3	13					6		31
CO Emissions (g/hr)		2450	150	219	912					431		2177
NOx Emissions (g/hr)		477	29	43	177					84		423
VOC Emissions (g/hr)		568	35	51	211					100		504
Dilemma Vehicles (#)		50	0	0	34					0		0
Queue Length 50th (ft)		324	26	124	283					144		~602
Queue Length 95th (ft)		406	m47	m164	m297					178		#754
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2743	756	229	1960					1162		1012
Starvation Cap Reductn		0	0	0	215					0		0
Spillback Cap Reductn		420	0	0	0					581		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.85	0.29	0.56	0.70					0.72		1.09

Intersection Summary

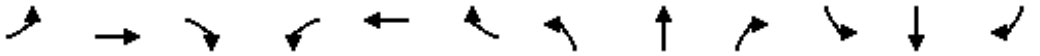
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 41.2		Intersection LOS: D	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

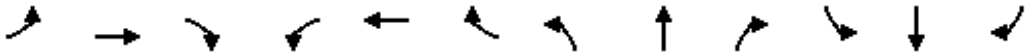
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Future Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			252			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.33	0.34			0.59	0.77	1.10		0.96			
Control Delay	204.9	3.4			36.8	27.0	131.8		56.6			
Queue Delay	0.7	0.1			0.0	0.0	0.0		0.0			
Total Delay	205.5	3.5			36.8	27.0	131.8		56.6			
LOS	F	A			D	C	F		E			
Approach Delay		132.8			30.8							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	1007	107			597	899	350		119			
Fuel Used(gal)	73	4			13	18	15		7			
CO Emissions (g/hr)	5085	310			923	1264	1025		474			
NOx Emissions (g/hr)	989	60			180	246	200		92			
VOC Emissions (g/hr)	1179	72			214	293	238		110			
Dilemma Vehicles (#)	0	18			27	0	0		0			
Queue Length 50th (ft)	~952	67			306	468	~228		142			
Queue Length 95th (ft)	#1078	75			375	573	#338		#351			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		414			
Starvation Cap Reductn	163	623			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.55	0.45			0.59	0.77	1.10		0.96			

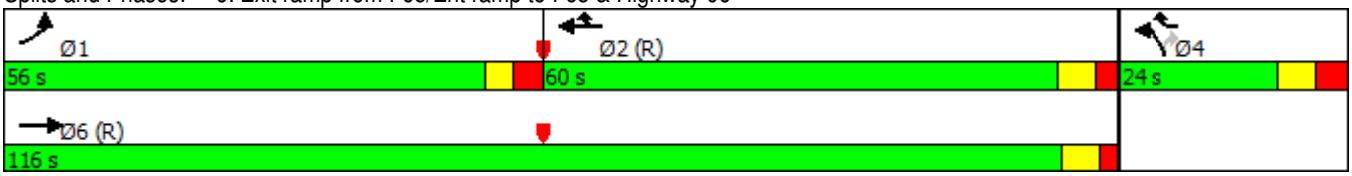
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.33			
Intersection Signal Delay: 87.9		Intersection LOS: F	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Future Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.906				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1631	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.083	0.950		0.704			0.285			0.252		
Satd. Flow (perm)	134	3319	1531	1268	1631	0	531	1925	1583	469	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		68				132		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	71	186	97	162	152	66	132	255	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	880	71	186	259	0	152	66	132	255	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	74.5	61.4	61.4	34.8	22.9		34.2	21.9	36.8	70.9	59.5	
Actuated g/C Ratio	0.62	0.51	0.51	0.29	0.19		0.28	0.18	0.31	0.59	0.50	
v/c Ratio	0.61	0.52	0.08	0.44	0.71		0.58	0.19	0.23	0.65	0.85	
Control Delay	29.2	22.0	0.2	34.6	43.2		39.1	39.7	5.3	20.8	31.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	29.2	22.0	0.2	34.6	43.2		39.1	39.7	5.3	20.8	31.8	
LOS	C	C	A	C	D		D	D	A	C	C	
Approach Delay		21.5			39.6			26.5		29.9		
Approach LOS		C			D			C		C		
90th %ile Green (s)	12.0	51.3	51.3	8.5	28.7		8.5	28.7	8.0	8.0	47.3	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	56.1	56.1	8.5	23.9		8.5	23.9	8.0	8.0	52.1	
70th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	10.3	59.6	59.6	8.5	20.4		8.5	20.4	8.0	8.0	57.3	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
30th %ile Green (s)	7.7	63.0	63.0	8.5	17.0		8.5	17.0	8.0	8.0	63.3	
30th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
10th %ile Green (s)	7.0	69.4	69.4	25.5	11.9		7.6	0.0	7.6	7.6	70.0	
10th %ile Term Code	Min	Coord	Coord	Hold	Gap		Gap	Skip	Gap	Gap	Coord	
Stops (vph)	47	542	0	112	120		84	31	14	89	658	
Fuel Used(gal)	1	10	0	2	3		2	1	1	4	21	
CO Emissions (g/hr)	84	717	14	165	215		171	59	71	260	1472	
NOx Emissions (g/hr)	16	139	3	32	42		33	12	14	51	286	
VOC Emissions (g/hr)	19	166	3	38	50		40	14	17	60	341	
Dilemma Vehicles (#)	0	0	0	0	0		0	2	0	0	0	
Queue Length 50th (ft)	42	226	0	111	140		88	43	0	78	422	
Queue Length 95th (ft)	70	328	0	135	108		105	49	40	116	447	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	254	1697	847	421	478		265	505	578	391	1448	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.54	0.52	0.08	0.44	0.54		0.57	0.13	0.23	0.65	0.85	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 64.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Future Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.987			0.906			0.876	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1575	1805	3447	0	1736	1672	0	1752	1593	0
Flt Permitted	0.138			0.121			0.168			0.405		
Satd. Flow (perm)	243	3438	1575	230	3447	0	307	1672	0	747	1593	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		11			57			165	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	114	1161	42	351	1251	122	97	90	150	61	66	319
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1161	42	351	1373	0	97	240	0	61	385	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	70.0	70.0	30.0	85.0		50.0	50.0		50.0	50.0	
Total Split (s)	14.0	72.0	72.0	29.0	87.0		49.0	49.0		49.0	49.0	
Total Split (%)	9.3%	48.0%	48.0%	19.3%	58.0%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	82.2	76.3	76.3	102.1	90.7		37.9	37.9		37.9	37.9	
Actuated g/C Ratio	0.55	0.51	0.51	0.68	0.60		0.25	0.25		0.25	0.25	
v/c Ratio	0.54	0.66	0.05	0.89	0.66		1.26	0.52		0.32	0.73	
Control Delay	22.5	31.3	0.1	50.6	9.5		225.4	33.3		48.0	36.4	
Queue Delay	0.0	0.0	0.0	0.0	2.5		0.0	0.0		0.0	0.0	
Total Delay	22.5	31.3	0.1	50.6	11.9		225.4	33.3		48.0	36.4	
LOS	C	C	A	D	B		F	C		D	D	
Approach Delay		29.5			19.8			88.6			38.0	
Approach LOS		C			B			F			D	
90th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
70th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
70th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
50th %ile Green (s)	7.5	67.5	67.5	22.5	82.5		40.5	40.5		40.5	40.5	
50th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Hold		Hold	Gap	
30th %ile Green (s)	7.5	75.6	75.6	22.5	90.6		32.4	32.4		32.4	32.4	
30th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Hold		Hold	Gap	
10th %ile Green (s)	6.9	91.3	91.3	19.2	103.6		20.0	20.0		20.0	20.0	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
Stops (vph)	43	813	0	282	618		68	125		35	193	
Fuel Used(gal)	2	25	0	6	13		5	3		1	5	
CO Emissions (g/hr)	125	1781	24	412	929		336	234		58	360	
NOx Emissions (g/hr)	24	347	5	80	181		65	46		11	70	
VOC Emissions (g/hr)	29	413	6	95	215		78	54		13	84	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	40	471	0	205	162		~107	158		47	194	
Queue Length 95th (ft)	59	567	0	m133	m599		#217	176		74	300	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	214	1748	861	403	2089		91	536		221	588	
Starvation Cap Reductn	0	0	0	0	562		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.53	0.66	0.05	0.87	0.90		1.07	0.45		0.28	0.65	

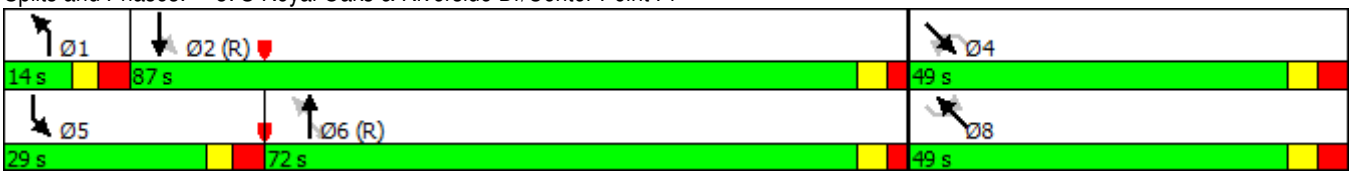
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 123 (82%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.26			
Intersection Signal Delay: 31.3		Intersection LOS: C	
Intersection Capacity Utilization 87.9%		ICU Level of Service E	
Analysis Period (min) 15			

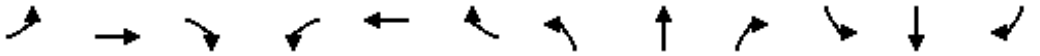
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

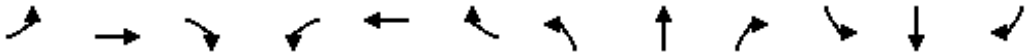
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Future Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					44	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1122	1290	302	191	443	1122	381	489	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1122	1290	302	191	443	1122	381	712	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

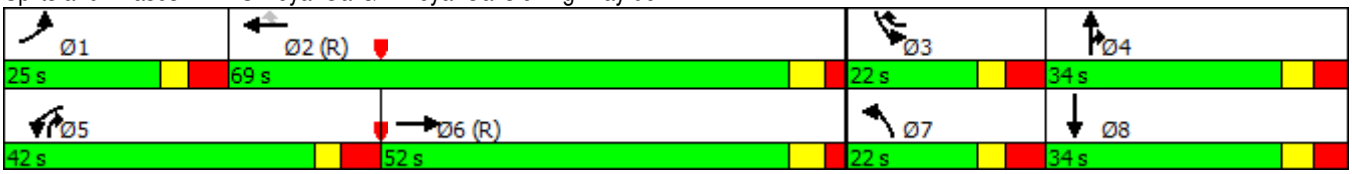


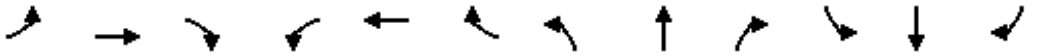
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.36	0.81	0.30	0.55	0.61	0.82	1.02	0.98	
Control Delay	68.7	44.7		200.8	49.2	16.6	58.5	59.9	52.2	117.0	84.1	
Queue Delay	0.0	0.3		0.3	0.6	0.0	0.1	0.0	0.1	0.0	0.5	
Total Delay	68.7	45.0		201.1	49.8	16.6	58.6	59.9	52.3	117.0	84.6	
LOS	E	D		F	D	B	E	E	D	F	F	
Approach Delay		48.6			108.6			54.9			95.9	
Approach LOS		D			F			D			F	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	16.7	45.5		34.5	63.3	14.5	14.5	26.5		14.5	26.5	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)	15.1	45.5		34.5	64.9	14.5	13.5	26.5		14.5	27.5	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	13.4	45.5		34.5	66.6	14.5	12.0	26.5		14.5	29.0	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	11.1	45.5		34.5	68.9	14.5	9.8	26.5		14.5	31.2	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	191	938		759	1064	208	133	346	815	280	539	
Fuel Used(gal)	6	25		55	32	5	3	9	21	11	19	
CO Emissions (g/hr)	401	1778		3861	2216	359	230	606	1488	800	1315	
NOx Emissions (g/hr)	78	346		751	431	70	45	118	289	156	256	
VOC Emissions (g/hr)	93	412		895	514	83	53	140	345	185	305	
Dilemma Vehicles (#)	0	44		0	45	0	0	0	0	0	0	
Queue Length 50th (ft)	107	316		~759	580	139	94	228	581	~203	~352	
Queue Length 95th (ft)	155	368		m#567	m517	m125	m105	m249	m716	#272	#505	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	725	
Starvation Cap Reductn	0	0		0	0	0	0	0	11	0	0	
Spillback Cap Reductn	0	48		46	84	0	10	0	0	0	2	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.83		1.44	0.85	0.30	0.51	0.61	0.83	1.02	0.98	

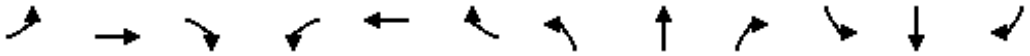
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.36			
Intersection Signal Delay: 80.6		Intersection LOS: F	
Intersection Capacity Utilization 90.0%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Future Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			400									135
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.99	0.78	1.35	0.58					0.77		1.43
Control Delay		71.6	30.4	226.4	26.5					43.9		229.0
Queue Delay		1.3	0.0	0.0	0.9					1.8		0.0
Total Delay		72.9	30.4	226.4	27.4					45.7		229.0
LOS		E	C	F	C					D		F
Approach Delay		63.3			81.4							
Approach LOS		E			F							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1873	465	222	498					776		998
Fuel Used(gal)		64	12	16	13					18		82
CO Emissions (g/hr)		4459	807	1146	935					1262		5755
NOx Emissions (g/hr)		868	157	223	182					246		1120
VOC Emissions (g/hr)		1033	187	266	217					292		1334
Dilemma Vehicles (#)		105	0	0	51					0		0
Queue Length 50th (ft)		634	325	~525	287					457		~1192
Queue Length 95th (ft)		m#692	m295	#521	430					515		#1297
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	802	297	1865					1368		1155
Starvation Cap Reductn		0	0	0	464					0		0
Spillback Cap Reductn		14	0	0	0					172		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.99	0.78	1.35	0.77					0.88		1.43

Intersection Summary

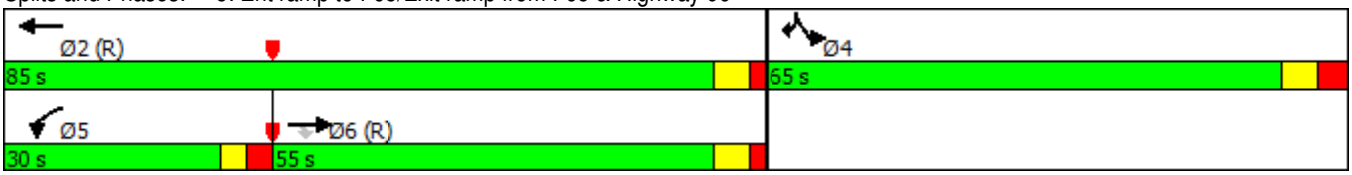
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 103.7		Intersection LOS: F	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			

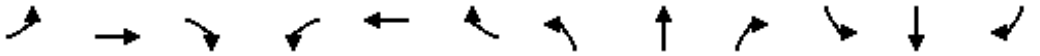
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

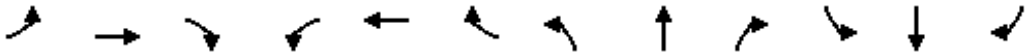
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Future Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						226			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

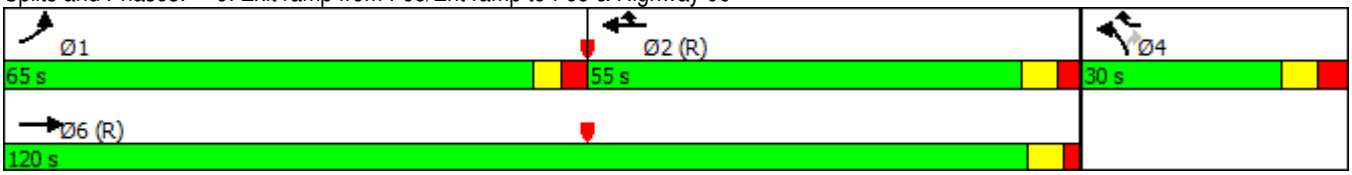


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	37.2	114.6			70.9	102.3	21.9		21.9			
Actuated g/C Ratio	0.25	0.76			0.47	0.68	0.15		0.15			
v/c Ratio	0.79	0.91			0.59	0.54	0.71		0.65			
Control Delay	79.7	23.9			31.8	10.9	69.9		48.9			
Queue Delay	0.0	5.4			0.0	0.0	0.0		0.0			
Total Delay	79.7	29.3			31.8	10.9	69.9		48.9			
LOS	E	C			C	B	E		D			
Approach Delay		40.1			20.9							
Approach LOS		D			C							
90th %ile Green (s)	45.2	114.0			62.3		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	40.9	114.0			66.6		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	37.2	114.0			70.3		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	34.1	114.0			73.4		22.5		22.5			
30th %ile Term Code	Gap	Coord			Coord		Max		Max			
10th %ile Green (s)	28.8	117.2			81.9		19.3		19.3			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	610	1847			646	395	295		100			
Fuel Used(gal)	18	38			23	19	7		3			
CO Emissions (g/hr)	1284	2656			1632	1299	521		208			
NOx Emissions (g/hr)	250	517			317	253	101		40			
VOC Emissions (g/hr)	298	615			378	301	121		48			
Dilemma Vehicles (#)	0	83			30	0	0		0			
Queue Length 50th (ft)	342	589			366	218	165		112			
Queue Length 95th (ft)	m344	m499			485	327	222		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2575			1672	1982	495		298			
Starvation Cap Reductn	0	199			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.50	0.99			0.59	0.54	0.69		0.63			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 35.1		Intersection LOS: D	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



HCS 2010 Two-Way Stop Control Summary Report

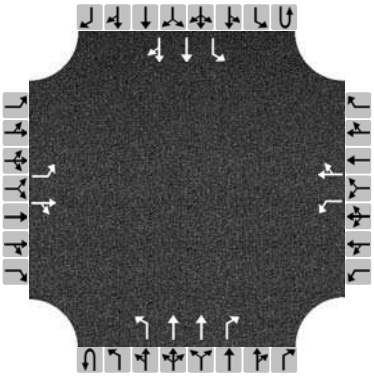
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	1	9		14	0	36		10	1447	25		64	665	51
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		10		14		37		10				66		
Capacity		148		392		99		361		877				446		
v/c Ratio		0.18		0.03		0.14		0.10		0.01				0.15		
95% Queue Length		0.6		0.1		0.5		0.3		0.0				0.5		
Control Delay (s/veh)		34.6		14.4		47.0		16.1		9.2				14.5		
Level of Service (LOS)		D		B		E		C		A				B		
Approach Delay (s/veh)	29.2				24.6				0.1				1.2			
Approach LOS	D				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

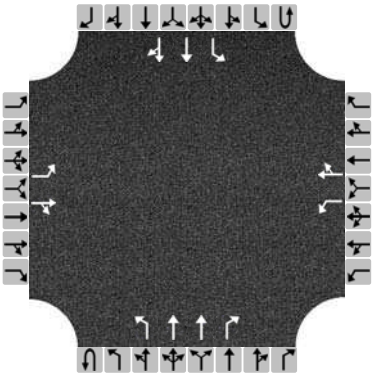
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	3	16		21	4	50		6	1014	17		43	1018	105
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		20		22		56		6				45		
Capacity		132		333		158		417		605				657		
v/c Ratio		0.20		0.06		0.14		0.13		0.01				0.07		
95% Queue Length		0.7		0.2		0.5		0.5		0.0				0.2		
Control Delay (s/veh)		39.0		16.5		31.4		15.0		11.0				10.9		
Level of Service (LOS)		E		C		D		B		B				B		
Approach Delay (s/veh)	29.4				19.6				0.1				0.4			
Approach LOS	D				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

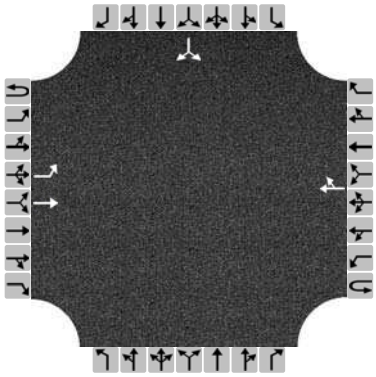
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		31	70				263	0						1		13
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		39													17	
Capacity		1242													708	
v/c Ratio		0.03													0.02	
95% Queue Length		0.1													0.1	
Control Delay (s/veh)		8.0													10.2	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	2.5												10.2			
Approach LOS	A												B			

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HCS 2010 Two-Way Stop Control Summary Report

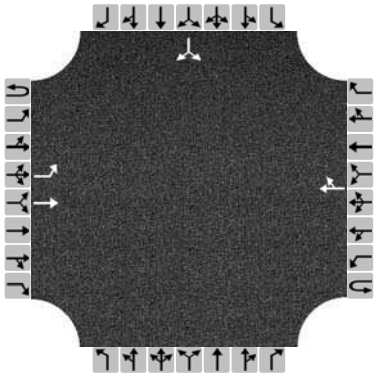
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		28	234				212	2						16		38
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		35													68	
Capacity		1309													681	
v/c Ratio		0.03													0.10	
95% Queue Length		0.1													0.3	
Control Delay (s/veh)		7.8													10.9	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.8												10.9			
Approach LOS	A												B			

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HCS 2010 Two-Way Stop Control Summary Report

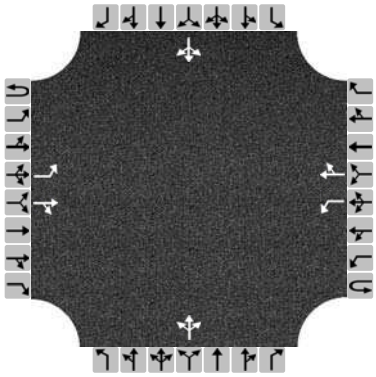
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and east dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Eastern Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		11	57	3		0	205	0		12	0	0		0	0	46
Percent Heavy Vehicles		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		14									15				58	
Capacity		1321				1537					571				788	
v/c Ratio		0.01									0.03				0.07	
95% Queue Length		0.0									0.1				0.2	
Control Delay (s/veh)		7.8				7.3					11.5				9.9	
Level of Service (LOS)		A				A					B				A	
Approach Delay (s/veh)	1.2								11.5				9.9			
Approach LOS	A								B				A			

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HCS 2010 Two-Way Stop Control Summary Report

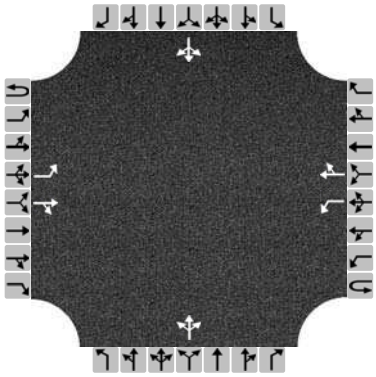
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and east dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Eastern Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		45	193	12		0	184	0		6	0	0		0	0	24
Percent Heavy Vehicles		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		56									8				30	
Capacity		1350				1321					475				814	
v/c Ratio		0.04									0.02				0.04	
95% Queue Length		0.1									0.1				0.1	
Control Delay (s/veh)		7.8				7.7					12.7				9.6	
Level of Service (LOS)		A				A					B				A	
Approach Delay (s/veh)	1.4								12.7				9.6			
Approach LOS	A								B				A			

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HCS 2010 Two-Way Stop Control Summary Report

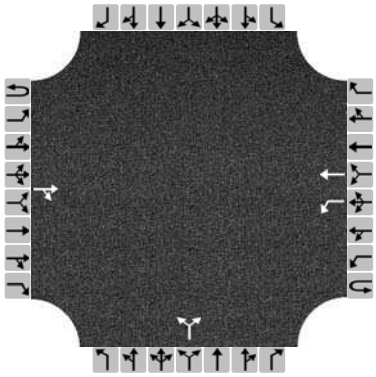
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and west dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western project dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	1	1	0		0	0	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			86	45		11	265			66		15				
Percent Heavy Vehicles						0				0		0				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						14					101					
Capacity						1427					596					
v/c Ratio						0.01					0.17					
95% Queue Length						0.0					0.6					
Control Delay (s/veh)						7.5					12.3					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					0.3				12.3							
Approach LOS					A				B							

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HCS 2010 Two-Way Stop Control Summary Report

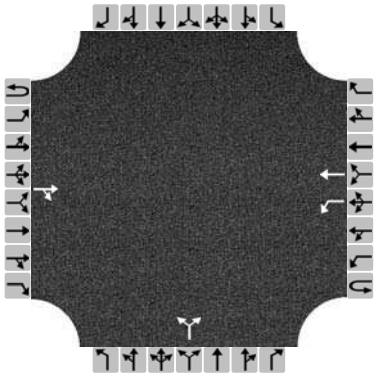
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and west dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western project dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	1	1	0		0	0	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			255	37		8	242			31		7				
Percent Heavy Vehicles						0				0		0				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						10					48					
Capacity						1205					513					
v/c Ratio						0.01					0.09					
95% Queue Length						0.0					0.3					
Control Delay (s/veh)						8.0					12.7					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					0.3				12.7							
Approach LOS					A				B							

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HCS 2010 Two-Way Stop Control Summary Report

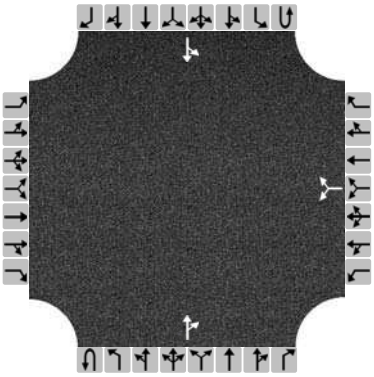
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	Home Depot and Apt Dwy
Jurisdiction	Franklin, TN
East/West Street	Project Driveway
North/South Street	Home Depot Access
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						46		37			0	11		10	0	
Percent Heavy Vehicles						0		0						0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							104							12		
Capacity							1023							1618		
v/c Ratio							0.10							0.01		
95% Queue Length							0.3							0.0		
Control Delay (s/veh)							8.9							7.2		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					8.9								7.2			
Approach LOS					A								A			

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HCS 2010 Two-Way Stop Control Summary Report

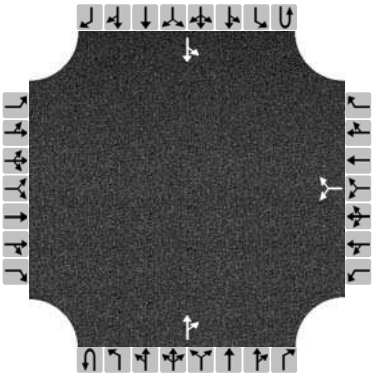
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	Home Depot and Apt Dwy
Jurisdiction	Franklin, TN
East/West Street	Project Driveway
North/South Street	Home Depot Access
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						24		20			0	45		37	0	
Percent Heavy Vehicles						0		0						0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							55							46		
Capacity							935							1562		
v/c Ratio							0.06							0.03		
95% Queue Length							0.2							0.1		
Control Delay (s/veh)							9.1							7.4		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					9.1								7.4			
Approach LOS					A								A			

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TOTAL PROJECTED CONDITIONS
With a third northbound through lane

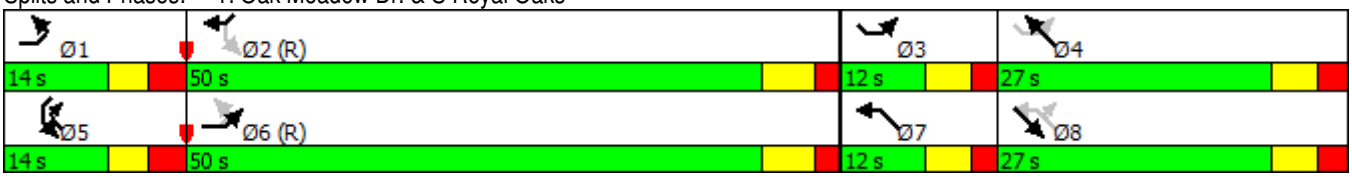
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Future Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		2	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.94	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt		0.989			0.885				0.850		0.850	
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1534	4801	0	1711	1594	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.271	0.956		0.715			0.495			0.177		
Satd. Flow (perm)	437	4801	0	1287	1594	0	922	1925	1583	330	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		154			97				90		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	92	163	29	97	87	64	249	75	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1283	0	163	126	0	87	64	249	75	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		41			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42		42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45		45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot		D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6			4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0		7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0		12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0		12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%		11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0		6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0		3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0		2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5		-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5		3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0		1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min		None	None		None	None	None	None	C-Min	
Act Effct Green (s)	71.0	60.1		20.0	12.3		20.0	12.3	25.3	70.3	59.8	
Actuated g/C Ratio	0.69	0.58		0.19	0.12		0.19	0.12	0.25	0.68	0.58	
v/c Ratio	0.32	0.45		0.57	0.46		0.34	0.28	0.55	0.21	0.47	
Control Delay	7.7	11.8		41.9	18.6		34.8	43.6	25.6	6.9	11.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.7	11.8		41.9	18.6		34.8	43.6	25.6	6.9	11.8	
LOS	A	B		D	B		C	D	C	A	B	
Approach Delay		11.4			31.7			30.5		11.4		
Approach LOS		B			C			C		B		
90th %ile Green (s)	8.0	52.3		6.5	13.7		6.5	13.7	7.0	7.0	51.3	
90th %ile Term Code	Max	Coord		Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.8	55.3		6.5	10.7		6.5	10.7	7.0	7.0	54.5	
70th %ile Term Code	Gap	Coord		Max	Hold		Max	Gap	Min	Min	Coord	
50th %ile Green (s)	7.0	56.6		6.5	9.4		6.5	9.4	7.0	7.0	56.6	
50th %ile Term Code	Min	Coord		Max	Hold		Max	Gap	Min	Min	Coord	
30th %ile Green (s)	7.0	57.9		6.5	8.1		6.5	8.1	7.0	7.0	57.9	
30th %ile Term Code	Min	Coord		Max	Hold		Max	Gap	Min	Min	Coord	
10th %ile Green (s)	7.0	71.0		7.5	7.0		0.0	0.0	7.0	7.0	71.0	
10th %ile Term Code	Min	Coord		Hold	Min		Skip	Skip	Min	Min	Coord	
Stops (vph)	27	567		112	27		51	33	126	18	271	
Fuel Used(gal)	1	11		2	1		1	1	4	1	10	
CO Emissions (g/hr)	46	771		162	68		96	62	270	62	724	
NOx Emissions (g/hr)	9	150		32	13		19	12	52	12	141	
VOC Emissions (g/hr)	11	179		38	16		22	14	63	14	168	
Dilemma Vehicles (#)	0	0		0	0		0	2	0	0	0	
Queue Length 50th (ft)	25	144		91	17		46	39	90	14	131	
Queue Length 95th (ft)	37	198		124	22		69	48	161	26	152	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70		75			100		195	180		
Base Capacity (vph)	415	2866		287	438		253	439	470	374	1681	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.31	0.45		0.57	0.29		0.34	0.15	0.53	0.20	0.47	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 52.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Future Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.993			0.934			0.868	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	4884	0	1787	3428	0	1754	1624	0	1787	1520	0
Flt Permitted	0.315			0.119			0.552			0.463		
Satd. Flow (perm)	556	4884	0	224	3428	0	1019	1624	0	871	1520	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			4			27			137	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	44	1387	118	343	778	37	10	68	53	49	19	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1505	0	343	815	0	10	121	0	49	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226		42	226		42	42		42	42	
Trailing Detector (ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6		45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0		5.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	17.0	73.0		17.0	73.0		10.0	50.0		10.0	50.0	
Total Split (s)	17.0	73.0		17.0	73.0		10.0	50.0		10.0	50.0	
Total Split (%)	11.3%	48.7%		11.3%	48.7%		6.7%	33.3%		6.7%	33.3%	
Maximum Green (s)	10.5	67.0		10.5	67.0		6.0	43.0		6.0	43.0	
Yellow Time (s)	3.0	3.5		3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5		3.5	2.5		0.5	3.5		0.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0		5.5	3.0		1.5	4.5		1.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.0	3.5		3.0	3.5	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0			8.0			8.0	
Flash Dont Walk (s)		16.0			20.0			32.0			35.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	103.4	97.8		110.4	103.7		27.4	17.2		30.7	23.3	
Actuated g/C Ratio	0.69	0.65		0.74	0.69		0.18	0.11		0.20	0.16	
v/c Ratio	0.10	0.47		1.21	0.34		0.04	0.58		0.20	0.44	
Control Delay	7.4	14.7		144.4	11.7		42.7	58.7		46.7	15.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.4	14.7		144.4	11.7		42.7	58.7		46.7	15.6	
LOS	A	B		F	B		D	E		D	B	
Approach Delay		14.5			51.0			57.5			23.0	
Approach LOS		B			D			E			C	
90th %ile Green (s)	8.6	83.8		10.5	85.7		7.3	21.2		11.0	24.9	
90th %ile Term Code	Gap	Coord		Max	Coord		Gap	Gap		Gap	Hold	
70th %ile Green (s)	7.6	89.2		10.5	92.1		6.6	17.3		9.5	20.2	
70th %ile Term Code	Gap	Coord		Max	Coord		Gap	Gap		Gap	Hold	
50th %ile Green (s)	7.0	92.8		10.5	96.3		0.0	14.7		8.5	27.2	
50th %ile Term Code	Gap	Coord		Max	Coord		Skip	Gap		Gap	Hold	
30th %ile Green (s)	6.5	96.5		10.5	100.5		0.0	12.1		7.4	23.5	
30th %ile Term Code	Gap	Coord		Max	Coord		Skip	Gap		Gap	Hold	
10th %ile Green (s)	0.0	111.7		10.5	128.7		0.0	8.3		0.0	8.3	
10th %ile Term Code	Skip	Coord		Max	Coord		Skip	Gap		Skip	Hold	
Stops (vph)	9	673		99	323		5	63		26	25	
Fuel Used(gal)	0	25		10	9		0	2		1	1	
CO Emissions (g/hr)	31	1769		720	601		9	142		41	75	
NOx Emissions (g/hr)	6	344		140	117		2	28		8	15	
VOC Emissions (g/hr)	7	410		167	139		2	33		10	17	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (ft)	11	264		~167	174		8	88		39	15	
Queue Length 95th (ft)	19	354		#399	261		14	105		52	21	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80			220			100			120		
Base Capacity (vph)	481	3188		284	2370		229	511		245	556	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

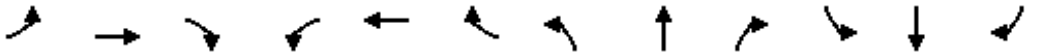
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.09	0.47		1.21	0.34		0.04	0.24		0.20	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 139 (93%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.21			
Intersection Signal Delay: 30.8		Intersection LOS: C	
Intersection Capacity Utilization 62.3%		ICU Level of Service B	
Analysis Period (min) 15			

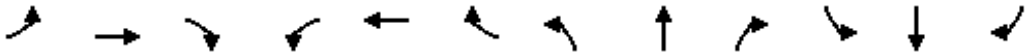
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Future Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				149					31	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	914	1091	319	121	340	1134	245	288	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	914	1091	319	121	340	1134	245	389	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

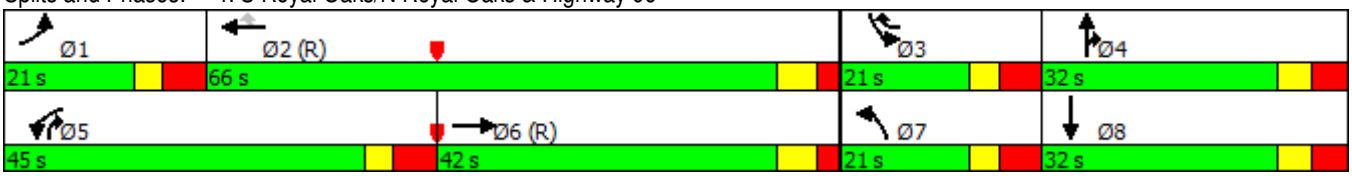


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.5	38.4		40.0	64.9	84.0	12.4	27.5	72.0	15.1	30.2	
Actuated g/C Ratio	0.10	0.27		0.29	0.46	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.43	0.72		0.97	0.69	0.31	0.41	0.48	0.77	0.69	0.54	
Control Delay	76.8	41.3		61.0	40.4	8.7	64.1	52.4	31.8	70.7	48.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	76.8	41.3		61.0	40.4	8.7	64.1	52.4	31.8	70.7	48.2	
LOS	E	D		E	D	A	E	D	C	E	D	
Approach Delay		46.0			44.1			38.6			56.9	
Approach LOS		D			D			D			E	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	13.3	24.5		13.5	24.7	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.4	35.5		37.5	60.6	13.5	11.6	24.5		13.5	26.4	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	11.2	35.5		37.5	61.8	13.5	10.4	24.5		13.5	27.6	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.9	35.5		37.5	63.1	13.5	9.2	24.5		13.5	28.8	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	8.1	37.6		37.5	67.0	11.4	7.5	24.5		11.4	28.4	
10th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	110	737		759	947	98	92	236	829	214	238	
Fuel Used(gal)	3	18		25	25	4	2	6	18	6	6	
CO Emissions (g/hr)	235	1272		1740	1782	261	169	412	1253	427	449	
NOx Emissions (g/hr)	46	247		338	347	51	33	80	244	83	87	
VOC Emissions (g/hr)	54	295		403	413	60	39	95	290	99	104	
Dilemma Vehicles (#)	0	28		0	36	0	0	0	0	0	0	
Queue Length 50th (ft)	69	285		419	535	78	54	145	459	112	153	
Queue Length 95th (ft)	93	338		m#446	m544	m122	78	172	561	159	167	
Internal Link Dist (ft)		620			611			712			884	

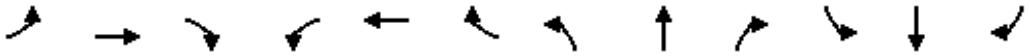
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1293		938	1578	1035	370	714	1473	367	723	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.72		0.97	0.69	0.31	0.33	0.48	0.77	0.67	0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 44.4		Intersection LOS: D	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Future Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			184									115
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.5	60.5	15.5	81.0					49.5		49.5
Actuated g/C Ratio		0.43	0.43	0.11	0.58					0.35		0.35
v/c Ratio		0.72	0.29	0.65	0.62					0.36		1.09
Control Delay		27.6	5.1	71.8	19.3					34.6		94.9
Queue Delay		0.8	0.0	0.0	0.3					2.1		0.0
Total Delay		28.3	5.1	71.8	19.5					36.7		94.9
LOS		C	A	E	B					D		F
Approach Delay		26.0			24.5							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		57.6	57.6	15.4	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		59.8	59.8	13.2	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.2	63.2	9.8	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		1165	39	111	497					256		836
Fuel Used(gal)		36	2	3	13					6		31
CO Emissions (g/hr)		2510	152	219	912					431		2177
NOx Emissions (g/hr)		488	30	43	177					84		423
VOC Emissions (g/hr)		582	35	51	211					100		504
Dilemma Vehicles (#)		50	0	0	34					0		0
Queue Length 50th (ft)		346	27	124	283					144		~602
Queue Length 95th (ft)		406	m47	m164	m297					178		#754
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2743	756	229	1960					1162		1012
Starvation Cap Reductn		0	0	0	215					0		0
Spillback Cap Reductn		420	0	0	0					581		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.85	0.29	0.56	0.70					0.72		1.09

Intersection Summary

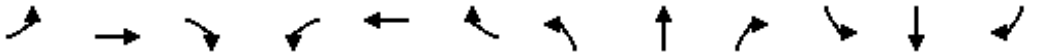
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 41.6		Intersection LOS: D	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

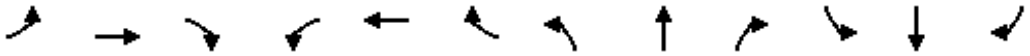
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Future Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			252			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.33	0.34			0.59	0.77	1.10		0.96			
Control Delay	204.9	3.4			36.8	27.0	131.8		56.6			
Queue Delay	0.7	0.1			0.0	0.0	0.0		0.0			
Total Delay	205.5	3.5			36.8	27.0	131.8		56.6			
LOS	F	A			D	C	F		E			
Approach Delay		132.8			30.8							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	1003	107			597	899	350		119			
Fuel Used(gal)	73	4			13	18	15		7			
CO Emissions (g/hr)	5083	310			923	1264	1025		474			
NOx Emissions (g/hr)	989	60			180	246	200		92			
VOC Emissions (g/hr)	1178	72			214	293	238		110			
Dilemma Vehicles (#)	0	18			27	0	0		0			
Queue Length 50th (ft)	~951	67			306	468	~228		142			
Queue Length 95th (ft)	#1078	75			375	573	#338		#351			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		414			
Starvation Cap Reductn	163	623			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.55	0.45			0.59	0.77	1.10		0.96			

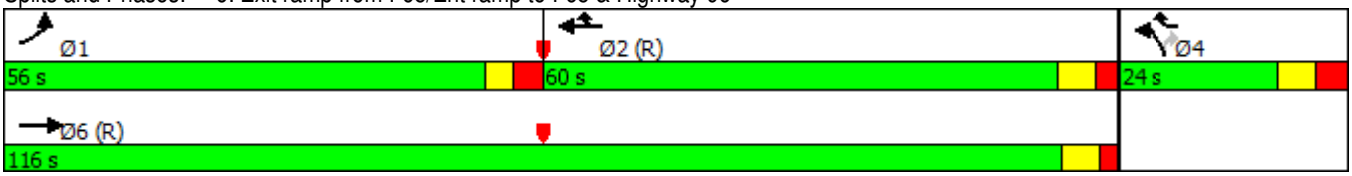
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.33			
Intersection Signal Delay: 87.9		Intersection LOS: F	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Future Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		2	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.94	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt		0.989			0.906				0.850		0.850	
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1534	4801	0	1711	1631	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.083	0.956		0.704			0.285			0.261		
Satd. Flow (perm)	134	4801	0	1268	1631	0	531	1925	1583	486	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		132			68				132		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	71	186	97	162	152	66	132	255	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	951	0	186	259	0	152	66	132	255	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		41			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42		42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45		45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot		D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6			4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0		7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0		14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0		14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%		11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0		8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0		3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0		2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5		-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5		3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0		1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min		None	None		None	None	None	None	C-Min	
Act Effct Green (s)	74.5	61.4		34.8	22.9		34.2	21.9	36.7	70.9	59.5	
Actuated g/C Ratio	0.62	0.51		0.29	0.19		0.28	0.18	0.31	0.59	0.50	
v/c Ratio	0.61	0.38		0.44	0.71		0.58	0.19	0.23	0.64	0.85	
Control Delay	29.2	16.3		34.6	43.2		39.1	39.7	5.3	20.1	31.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	29.2	16.3		34.6	43.2		39.1	39.7	5.3	20.1	31.8	
LOS	C	B		C	D		D	D	A	C	C	
Approach Delay		17.9			39.6			26.5		29.8		
Approach LOS		B			D			C		C		
90th %ile Green (s)	12.0	51.3		8.5	28.7		8.5	28.7	8.0	8.0	47.3	
90th %ile Term Code	Max	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	56.1		8.5	23.9		8.5	23.9	8.0	8.0	52.1	
70th %ile Term Code	Max	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	10.3	59.6		8.5	20.4		8.5	20.4	8.0	8.0	57.3	
50th %ile Term Code	Gap	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
30th %ile Green (s)	7.7	63.0		8.5	17.0		8.5	17.0	8.0	8.0	63.3	
30th %ile Term Code	Gap	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
10th %ile Green (s)	7.0	69.7		25.5	11.9		7.6	0.0	7.3	7.3	70.0	
10th %ile Term Code	Min	Coord		Hold	Gap		Gap	Skip	Gap	Gap	Coord	
Stops (vph)	47	445		112	120		84	31	14	91	658	
Fuel Used(gal)	1	9		2	3		2	1	1	4	21	
CO Emissions (g/hr)	84	637		165	215		171	59	71	259	1472	
NOx Emissions (g/hr)	16	124		32	42		33	12	14	50	286	
VOC Emissions (g/hr)	19	148		38	50		40	14	17	60	341	
Dilemma Vehicles (#)	0	0		0	0		0	2	0	0	0	
Queue Length 50th (ft)	42	130		111	140		88	43	0	78	422	
Queue Length 95th (ft)	70	188		135	108		105	49	40	116	447	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70		75			100		195	180		
Base Capacity (vph)	254	2522		421	478		265	505	578	400	1448	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.54	0.38		0.44	0.54		0.57	0.13	0.23	0.64	0.85	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 26.9	Intersection LOS: C
Intersection Capacity Utilization 58.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

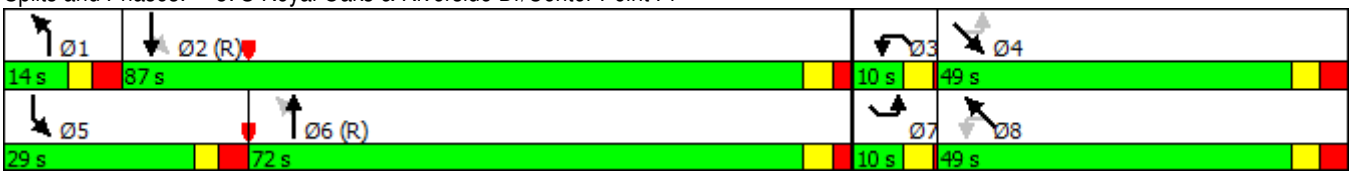
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Future Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.987			0.906			0.876	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	4913	0	1805	3447	0	1736	1672	0	1752	1593	0
Flt Permitted	0.116			0.138			0.111			0.421		
Satd. Flow (perm)	205	4913	0	262	3447	0	203	1672	0	776	1593	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			10			52			151	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	114	1161	42	351	1251	122	97	90	150	61	66	319
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1203	0	351	1373	0	97	240	0	61	385	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226		42	226		42	42		42	42	
Trailing Detector (ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6		45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												

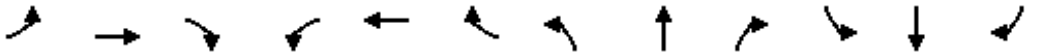
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0		5.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	15.0	70.0		30.0	85.0		10.0	50.0		10.0	50.0	
Total Split (s)	14.0	72.0		29.0	87.0		10.0	49.0		10.0	49.0	
Total Split (%)	8.8%	45.0%		18.1%	54.4%		6.3%	30.6%		6.3%	30.6%	
Maximum Green (s)	7.5	66.0		22.5	81.0		6.0	42.0		6.0	42.0	
Yellow Time (s)	3.0	3.5		3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5		3.5	2.5		0.5	3.5		0.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0		5.5	3.0		1.5	4.5		1.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.0	3.5		3.0	3.5	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0			8.0			8.0	
Flash Dont Walk (s)		16.0			20.0			32.0			35.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	82.3	76.3		101.9	90.4		50.8	38.1		47.3	33.7	
Actuated g/C Ratio	0.51	0.48		0.64	0.56		0.32	0.24		0.30	0.21	
v/c Ratio	0.62	0.51		0.91	0.70		0.52	0.55		0.21	0.85	
Control Delay	33.6	31.2		56.7	28.8		47.7	45.7		37.6	53.0	
Queue Delay	0.0	0.0		0.0	1.2		0.0	0.0		0.0	0.0	
Total Delay	33.6	31.2		56.7	30.0		47.7	45.7		37.6	53.0	
LOS	C	C		E	C		D	D		D	D	
Approach Delay		31.4			35.4			46.2			50.9	
Approach LOS		C			D			D			D	
90th %ile Green (s)	7.5	65.5		22.5	80.5		6.5	42.0		6.5	42.0	
90th %ile Term Code	Max	Coord		Max	Coord		Max	Hold		Max	Max	
70th %ile Green (s)	7.5	62.9		22.5	77.9		14.1	40.7		10.4	37.0	
70th %ile Term Code	Max	Coord		Max	Coord		Gap	Hold		Gap	Gap	
50th %ile Green (s)	7.5	69.8		22.5	84.8		12.4	34.9		9.3	31.8	
50th %ile Term Code	Max	Coord		Max	Coord		Gap	Hold		Gap	Gap	
30th %ile Green (s)	7.5	76.8		22.5	91.8		10.8	29.1		8.1	26.4	
30th %ile Term Code	Max	Coord		Max	Coord		Gap	Hold		Gap	Gap	
10th %ile Green (s)	7.5	91.6		17.8	101.9		8.5	31.1		0.0	18.6	
10th %ile Term Code	Max	Coord		Gap	Coord		Gap	Hold		Skip	Gap	
Stops (vph)	47	770		142	868		57	127		30	220	
Fuel Used(gal)	2	26		5	19		2	4		1	7	
CO Emissions (g/hr)	141	1800		381	1361		122	268		49	456	
NOx Emissions (g/hr)	27	350		74	265		24	52		10	89	
VOC Emissions (g/hr)	33	417		88	315		28	62		11	106	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (ft)	47	327		224	547		72	175		44	248	
Queue Length 95th (ft)	70	394		262	676		110	181		65	340	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80			220			100			120		
Base Capacity (vph)	183	2367		393	1967		188	502		294	552	
Starvation Cap Reductn	0	0		0	349		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.62	0.51		0.89	0.85		0.52	0.48		0.21	0.70	

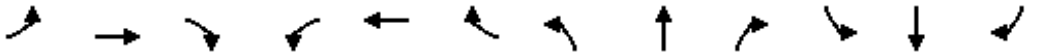
Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 123 (77%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 160			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 36.8		Intersection LOS: D	
Intersection Capacity Utilization 80.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Future Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					44	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1122	1290	302	191	443	1122	381	489	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1122	1290	302	191	443	1122	381	712	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

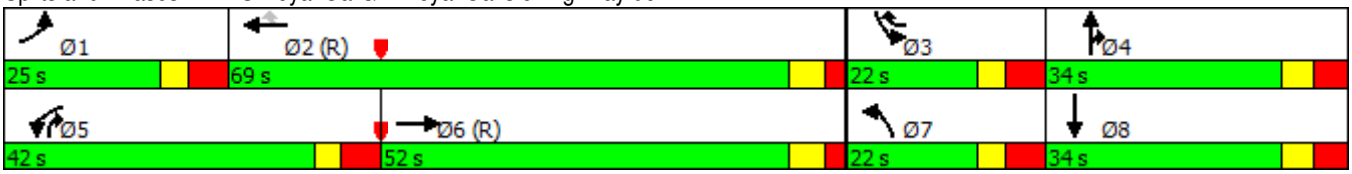


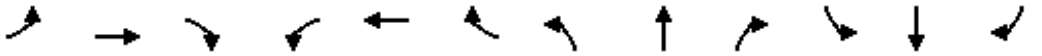
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.36	0.81	0.30	0.55	0.61	0.82	1.02	0.98	
Control Delay	68.7	44.7		200.8	49.2	16.6	70.5	59.0	40.1	117.0	84.1	
Queue Delay	0.0	0.0		0.0	0.6	0.0	0.1	0.0	0.1	0.0	0.0	
Total Delay	68.7	44.7		200.8	49.8	16.6	70.7	59.0	40.3	117.0	84.1	
LOS	E	D		F	D	B	E	E	D	F	F	
Approach Delay		48.3			108.5			48.3			95.5	
Approach LOS		D			F			D			F	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	16.7	45.5		34.5	63.3	14.5	14.5	26.5		14.5	26.5	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)	15.1	45.5		34.5	64.9	14.5	13.5	26.5		14.5	27.5	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	13.4	45.5		34.5	66.6	14.5	12.0	26.5		14.5	29.0	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	11.1	45.5		34.5	68.9	14.5	9.8	26.5		14.5	31.2	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	191	938		759	1064	208	131	330	843	280	539	
Fuel Used(gal)	6	25		55	32	5	4	9	19	11	19	
CO Emissions (g/hr)	401	1778		3861	2216	359	253	595	1327	800	1315	
NOx Emissions (g/hr)	78	346		751	431	70	49	116	258	156	256	
VOC Emissions (g/hr)	93	412		895	514	83	59	138	308	185	305	
Dilemma Vehicles (#)	0	44		0	45	0	0	0	0	0	0	
Queue Length 50th (ft)	107	316		~759	580	139	92	210	528	~203	~352	
Queue Length 95th (ft)	155	368		m#567	m517	m125	108	246	624	#272	#505	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	725	
Starvation Cap Reductn	0	0		0	0	0	0	0	15	0	0	
Spillback Cap Reductn	0	0		0	84	0	10	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.80		1.36	0.85	0.30	0.51	0.61	0.83	1.02	0.98	

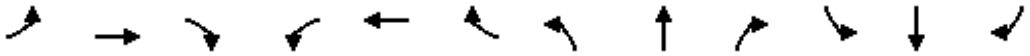
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.36			
Intersection Signal Delay: 78.8		Intersection LOS: E	
Intersection Capacity Utilization 90.0%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Future Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			400									135
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.99	0.78	1.35	0.58					0.77		1.43
Control Delay		72.0	30.6	226.4	26.5					43.9		229.0
Queue Delay		1.3	0.0	0.0	0.9					1.8		0.0
Total Delay		73.3	30.6	226.4	27.4					45.7		229.0
LOS		E	C	F	C					D		F
Approach Delay		63.7			81.4							
Approach LOS		E			F							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1876	474	222	498					776		998
Fuel Used(gal)		64	12	16	13					18		82
CO Emissions (g/hr)		4472	814	1146	935					1262		5755
NOx Emissions (g/hr)		870	158	223	182					246		1120
VOC Emissions (g/hr)		1036	189	266	217					292		1334
Dilemma Vehicles (#)		105	0	0	51					0		0
Queue Length 50th (ft)		637	324	~525	287					457		~1192
Queue Length 95th (ft)		m#693	m295	#521	430					515		#1297
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	802	297	1865					1368		1155
Starvation Cap Reductn		0	0	0	464					0		0
Spillback Cap Reductn		14	0	0	0					172		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.99	0.78	1.35	0.77					0.88		1.43

Intersection Summary

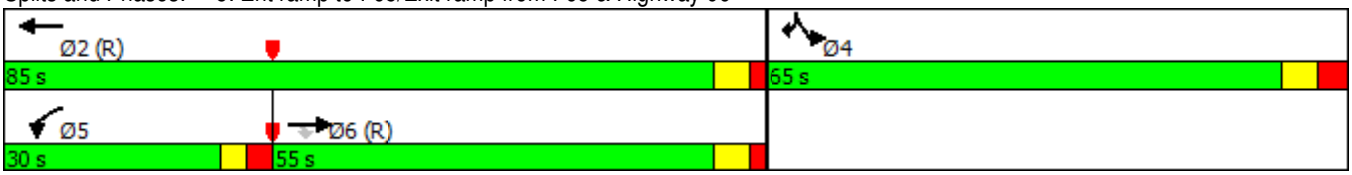
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 103.9		Intersection LOS: F	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			

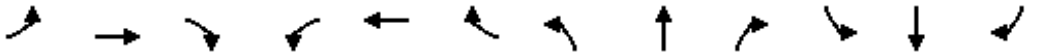
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

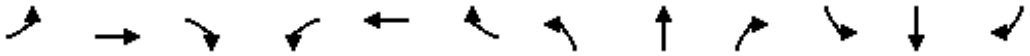
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Future Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						226			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

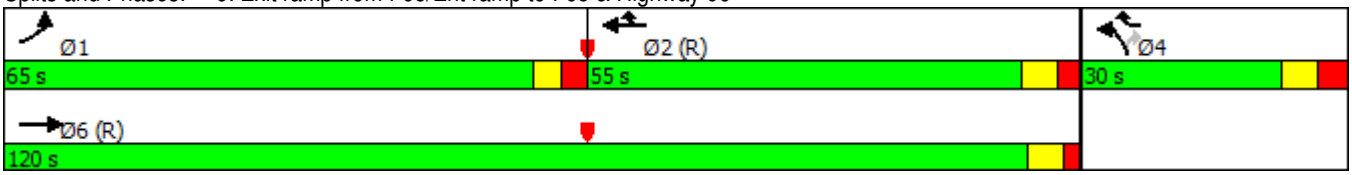


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	37.2	114.6			70.9	102.3	21.9		21.9			
Actuated g/C Ratio	0.25	0.76			0.47	0.68	0.15		0.15			
v/c Ratio	0.79	0.91			0.59	0.54	0.71		0.65			
Control Delay	79.7	23.9			31.8	10.9	69.9		48.9			
Queue Delay	0.0	5.4			0.0	0.0	0.0		0.0			
Total Delay	79.7	29.3			31.8	10.9	69.9		48.9			
LOS	E	C			C	B	E		D			
Approach Delay		40.1			20.9							
Approach LOS		D			C							
90th %ile Green (s)	45.2	114.0			62.3		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	40.9	114.0			66.6		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	37.2	114.0			70.3		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	34.1	114.0			73.4		22.5		22.5			
30th %ile Term Code	Gap	Coord			Coord		Max		Max			
10th %ile Green (s)	28.8	117.2			81.9		19.3		19.3			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	610	1847			646	395	295		100			
Fuel Used(gal)	18	38			23	19	7		3			
CO Emissions (g/hr)	1284	2656			1632	1299	521		208			
NOx Emissions (g/hr)	250	517			317	253	101		40			
VOC Emissions (g/hr)	298	615			378	301	121		48			
Dilemma Vehicles (#)	0	83			30	0	0		0			
Queue Length 50th (ft)	342	589			366	218	165		112			
Queue Length 95th (ft)	m344	m499			485	327	222		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2575			1672	1982	495		298			
Starvation Cap Reductn	0	199			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.50	0.99			0.59	0.54	0.69		0.63			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 35.1		Intersection LOS: D	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



APPENDIX D
TRIP GENERATION

TRIP GENERATION CALCULATIONS – Assisted Living

The following calculations are based on the data compiled for ITE Land Use Code 254.

Average Daily Traffic

T = 2.74 (X)
T = 2.74 (**208**)
T = 570 vehicles

Enter = 0.50 (570) = 285 vehicles
Exit = 0.50 (570) = 285 vehicles

AM traffic during peak hour of adjacent street

T = 0.23 (X)
T = 0.23 (**208**)
T = 47 vehicles

Enter = 0.72 (47) = 34 vehicles
Exit = 0.28 (47) = 13 vehicles

PM traffic during peak hour of adjacent street

T = 0.37 (X)
T = 0.37 (**208**)
T = 77 vehicles

Enter = 0.39 (77) = 30 vehicles
Exit = 0.61 (77) = 47 vehicles

TRIP GENERATION CALCULATIONS – Multi-Family (South)

The following calculations are based on the data compiled for ITE Land Use Code 220.

Average Daily Traffic

T = 6.65 (X)
T = 6.65 (**98**)
T = 652 vehicle-trips

Enter = 0.50 (652) = 326 vehicles
Exit = 0.50 (652) = 326 vehicles

A.M. traffic during peak hour of adjacent street

T = 0.51 (X)
T = 0.51 (**98**)
T = 50 vehicle-trips

Enter = 0.20 (50) = 10 vehicles
Exit = 0.80 (50) = 40 vehicles

P.M. traffic during peak hour of adjacent street

T = 0.62 (X)
T = 0.62 (**98**)
T = 60 vehicle-trips

Enter = 0.65 (60) = 39 vehicles
Exit = 0.35 (60) = 21 vehicles

TRIP GENERATION CALCULATIONS – Multi-Family (North)

The following calculations are based on the data compiled for ITE Land Use Code 220.

Average Daily Traffic

T = 6.65 (X)
T = 6.65 (**204**)
T = 1,356 vehicle-trips

Enter = 0.50 (1,356) = 678 vehicles
Exit = 0.50 (1,356) = 678 vehicles

A.M. traffic during peak hour of adjacent street

T = 0.51 (X)
T = 0.51 (**204**)
T = 104 vehicle-trips

Enter = 0.20 (104) = 21 vehicles
Exit = 0.80 (104) = 83 vehicles

P.M. traffic during peak hour of adjacent street

T = 0.62 (X)
T = 0.62 (**204**)
T = 126 vehicle-trips

Enter = 0.65 (126) = 82 vehicles
Exit = 0.35 (126) = 44 vehicles

TRIP GENERATION CALCULATIONS – Specialty Retail

The following calculations are based on the data compiled for ITE Land Use Code 826.

Average Daily Traffic

T = 44.32 (X)
T = 44.32 (**15.000**)
T = 664 vehicle-trips

Enter = 0.50 (664) = 332 vehicles
Exit = 0.50 (664) = 332 vehicles

A.M. traffic during peak hour of adjacent street

T = 6.84 (X)
T = 6.84 (**15.000**)
T = 102 vehicle-trips

Enter = 0.48 (102) = 49 vehicles
Exit = 0.52 (102) = 53 vehicles

P.M. traffic during peak hour of adjacent street

T = 2.71 (X)
T = 2.71 (**15.000**)
T = 41 vehicle-trips

Enter = 0.44 (41) = 18 vehicles
Exit = 0.56 (41) = 23 vehicles

HISTORIC FRANKLIN TENNESSEE

MEMORANDUM

DATE: April 20, 2016

TO: Franklin Municipal Planning Commission

FROM: Amy Diaz-Barriga, Current Planning Supervisor
Bob Martin, Interim Director of Planning and Sustainability

Subject

..title

Consideration Of Ordinance 2016-008, To Be Entitled, "An Ordinance To Rezone 30.39 Acres From General Commercial (GC) District To Specific Development-Residential (SD-R 11.7) District For The Property Located West Of Interstate 65, At 840 And 880 Oak Meadow Drive."

..body

Project Information

COF Project Number: 6085
Applicant: **Adam Crunk, Crunk Engineering**
Owner: **Warner Bass**

Background/Staff Comments

Any request for an SD zoning district is required to be accompanied by a PUD Development Plan. Neither the Planning nor Engineering Departments support the PUD Development Plan associated with this rezoning, and therefore cannot support this rezoning request. There are conceptual flaws on the site design of the Development Plan. The plan will cater to cars and not residents, and will have little regard for creating open spaces and a site experience to benefit its residents. Engineering is skeptical that the conceptual design of its stormwater detention and water quality will be sufficient in size to handle the run-off of the site.

Further, the proposed use at the requested density will ignite traffic concerns for the area, which at this point are unresolved in the applicant's provided traffic study. The intersection of South Royal Oaks Boulevard and Riverside Drive is currently at an unacceptable level, and the applicant's study is lacking the documentation and analysis of how their proposed off-site improvements will alleviate some of the current congestion. Without data to support the study's claims, this rezoning request seems premature.

Project Considerations

Project Considerations are not conditions of this approval, but are intended to highlight issues that should be considered in the overall site design or may be required when more detailed plans are submitted for review. These items are not meant to be exhaustive and all City requirements and ordinances must be met with each plan submittal.

Regarding the requested analysis for South Royal Oaks & Center Point/Riverside to investigate protected/permitted left turn phasing for the side streets, this was not performed. Furthermore, the Synchro technical analyses using permitted left turns on the side streets show errors. The applicant shall correct the errors and investigate the protected/permitted left turn phasing for the side streets. Staff has informed the applicant that the City of Franklin's preliminary investigation of such phasing shows improvements in intersection operations. The applicant shall also address the 3rd party review comments as approved by the City Traffic Engineer and uploaded into IDT.

Recommendation

..recommendation

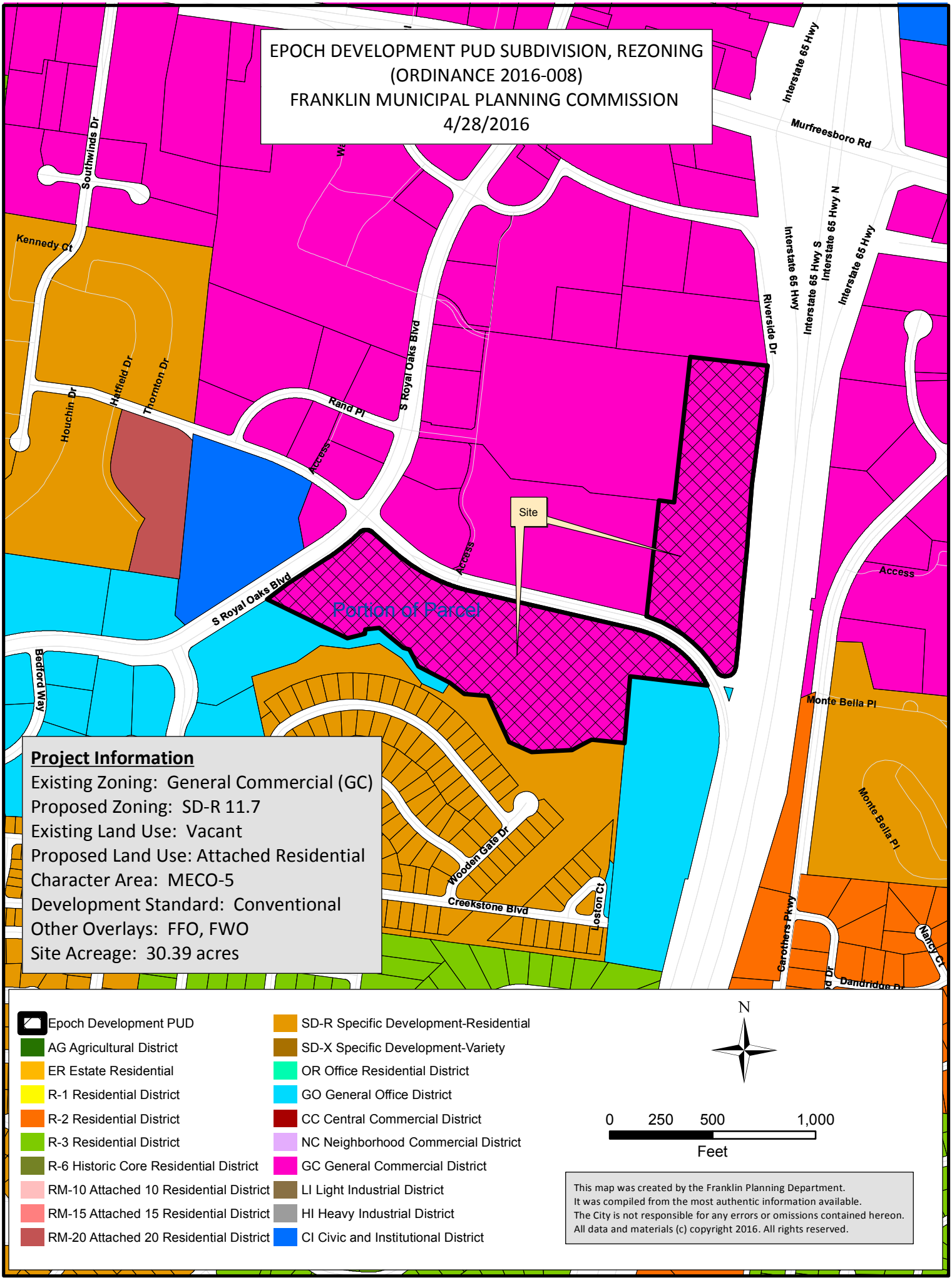
Disapproval.

..end

See attached pages for a list of staff recommended conditions of approval.

PROCEDURAL REQUIREMENTS:

1. The city's project identification number shall be included on all correspondence with any city department relative to this project.


EPOCH DEVELOPMENT PUD SUBDIVISION, REZONING
(ORDINANCE 2016-008)
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/2016
Project Information
Existing Zoning: General Commercial (GC)
Proposed Zoning: SD-R 11.7
Existing Land Use: Vacant
Proposed Land Use: Attached Residential
Character Area: MECO-5
Development Standard: Conventional
Other Overlays: FFO, FWO
Site Acreage: 30.39 acres
Site
Portion of Parcel
Southwinds Dr
Kennedy Ct
Houchin Dr
Hatfield Dr
Thornton Dr
Rand Pl
S Royal Oaks Blvd
Access
Bedford Way
Murfreesboro Rd
Interstate 65 Hwy
Interstate 65 Hwy S
Interstate 65 Hwy N
Riverside Dr
Monte Bella Pl
Wooden Gate Dr
Creekstone Blvd
Loston Ct
Carothers Pkwy
Nancy Ct
Dandridge Dr
Epoch Development PUD
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0 250 500 1,000
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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ORDINANCE 2016-008

TO BE ENTITLED, "AN ORDINANCE TO REZONE 30.39 ACRES FROM GENERAL COMMERCIAL (GC) DISTRICT TO SPECIFIC DEVELOPMENT-RESIDENTIAL (SD-R 12) DISTRICT FOR THE PROPERTY LOCATED WEST OF INTERSTATE 65, AT 840 AND 880 OAK MEADOW DRIVE."

WHEREAS, the City of Franklin, Tennessee, encourages responsible growth and the sensible transition of land uses and densities; and

WHEREAS, the Specific Development-Residential district provides zoning for land uses compatible with both the Franklin Land Use Plan and surrounding development; and

WHEREAS, the Board of Mayor and Alderman (BOMA) of the City of Franklin, Tennessee, adopted Resolution 2016-20, approving a Plan Unit Development (PUD) Development Plan as required by the Franklin Zoning Ordinance; and

WHEREAS, the zoning has been reviewed and approved by BOMA after a public hearing and a recommendation by the Franklin Municipal Planning Commission.

NOW THEREFORE BE IT ORDAINED BY THE BOARD OF MAYOR AND ALDERMAN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That the following described property shall be, and is hereby, rezoned from its present zoning classification of **GC** District to **SD-R (12.0)** District:

PREMISES CONSIDERED

Map-Parcel	Acres
79-88 (portion of)	13.06
79-101.19	17.33
Total	30.39

LOT 24
MAP 79, PORTION OF PARCEL 88.00
SURVEY TRACT 1

A TRACT OF LAND IN THE NINTH CIVIL DISTRICT OF WILLIAMSON COUNTY, CITY OF FRANKLIN, TENNESSEE AND BEING GENERALLY BOUNDED ON THE NORTH BY OAK MEADOW DRIVE, (RIGHT-OF-WAY WIDTH VARIES), ON THE EAST BY NASHVILLE LODGE NO. 72, B.P.O. ELKS, RECORDED IN DEED BOOK 1708, PAGE 12, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE (R.O.W.C.,T.) ON THE SOUTH BY OPEN SPACE LOT 808 AS SHOWN ON THE PLAN ENTITLED "CREEKSTONE COMMONS, P.U.D SUBDIVISION, SECTION FOUR" OF RECORD IN PLAT BOOK P58, PAGE 10, R.O.W.C.,T. AND LOT 27 AS SHOWN ON THE PLAN ENTITLED "CREEKSTONE COMMONS, REVISION FOUR" OF RECORD IN PLAT BOOK P49, PAGE 110, R.O.W.C.,T. AND ON THE WEST BY THE REMAINDER OF LOT 24 OF FINAL PLAN OF WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, OF RECORD IN PLAT BOOK 29, PAGE 139, R.O.W.C.T AND BEING DESCRIBED ACCORDING TO A SURVEY DATED OCTOBER 15, 2015 AND PREPARED BY KEVIN L. BIRDWELL, R.L.S. NO. 1797 WHOSE ADDRESS IS RAGAN SMITH ASSOCIATES, 315 WOODLAND STREET, NASHVILLE, TN 37206 AND BEING MORE

PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING IN THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND BEING THE SOUTH END OF A CURVE AT THE INTERSECTION OF THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND PROCEEDING AS FOLLOWS:
THENCE, WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 72.76 FEET, A CENTRAL ANGLE OF 83 DEGREES 22 MINUTES 19 SECONDS, AND A CHORD BEARING AND DISTANCE OF NORTH 89 DEGREES 31 MINUTES 21 SECONDS EAST, 66.50 FEET TO AN IRON ROD (NEW) WITH CAP STAMPED (RSA) IN THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE;
THENCE, WITH THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE THE FOLLOWING TWO CALLS:
1. SOUTH 48 DEGREES 47 MINUTES 29 SECONDS EAST, 121.81 FEET;
2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 820.00 FEET, AN ARC LENGTH OF 71.61 FEET, A CENTRAL ANGLE OF 05 DEGREES 00 MINUTES 12 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 51 DEGREES 17 MINUTES 35 SECONDS EAST, 71.58 FEET TO AN IRON ROD (NEW) WITH CAP STAMPED (RSA), THE **POINT OF BEGINNING** OF THE HEREIN DESCRIBED TRACT OF LAND AND PROCEEEDING AS FOLLOWS:
THENCE, WITH SAID SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE THE FOLLOWING THREE CALLS:
1. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 820.00 FEET, AN ARC LENGTH OF 330.94 FEET, A CENTRAL ANGLE OF 23 DEGREES 07 MINUTES 24 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 65 DEGREES 21 MINUTES 21 SECONDS EAST, 328.69 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. SOUTH 76 DEGREES 55 MINUTES 03 SECONDS EAST, 834.46 FEET TO AN IRON ROD (NEW)WITH CAP STAMPED (RSA);
3. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 537.96 FEET, AN ARC LENGTH OF 464.57 FEET, A CENTRAL ANGLE OF 49 DEGREES 28 MINUTES 46 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 52 DEGREES 10 MINUTES 40 SECONDS EAST, 450.27 FEET TO AN IRON ROD (NEW)WITH CAP STAMPED (RSA);
THENCE, LEAVING THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND WITH THE NORTH LINE OF THE NASHVILLE LODGE NO. 72, B.P.O. ELKS PROPERTY, NORTH 83 DEGREES 59 MINUTES 15 SECONDS WEST, 376.29 FEET TO A 1/2 INCH DIAMETER IRON ROD (OLD),
THENCE, WITH THE WEST LINE OF THE NASHVILLE LODGE NO. 72, B.P.O. ELKS PROPERTY, SOUTH 05 DEGREES 14 MINUTES 00 SECONDS WEST, PASSING A WITNESS IRON ROD (NEW) ON THE NORTH SIDE OF WATSON BRANCH AT A DISTANCE OF 298.26 AND A TOTAL DISTANCE OF 323.26 FEET TO A POINT IN THE CENTER OF WATSON BRANCH, SAID POINT BEING THE NORTHEAST CORNER OF LOT 808 ON SAID PLAN OF CREEKSTONE COMMONS P.U.D. SUDIVISION, SECTION FOUR;
THENCE, WITH THE CENTERLINE OF WATSON BRANCH AND THE NORTH LINE OF LOT 808 OF SAID CREEKSTONE COMMONS P.U.D. SUBDIVISION, SECTION FOUR AND THE NORTH LINE OF LOT 27 ON SAID PLAN OF CREEKSTONE COMMONS SUBDIVISION, REVISION 4 THE FOLLOWING SIXTEEN BEARINGS AND DISTANCES:
1. NORTH 83 DEGREES 48 MINUTES 10 SECONDS WEST, 161.22 FEET;
2. SOUTH 61 DEGREES 46 MINUTES 08 SECONDS WEST, 106.65 FEET;
3. SOUTH 86 DEGREES 48 MINUTES 30 SECONDS WEST, 198.12 FEET;
4. NORTH 65 DEGREES 28 MINUTES 52 SECONDS WEST, 120.02 FEET;
5. NORTH 24 DEGREES 43 MINUTES 04 SECONDS WEST, 244.21 FEET;
6. NORTH 84 DEGREES 36 MINUTES 00 SECONDS WEST, 115.35 FEET;
7. NORTH 52 DEGREES 04 MINUTES 01 SECONDS WEST, 87.70 FEET;
8. NORTH 57 DEGREES 18 MINUTES 12 SECONDS WEST, 163.19 FEET;
9. NORTH 29 DEGREES 52 MINUTES 55 SECONDS WEST, 101.80 FEET;
10. NORTH 74 DEGREES 02 MINUTES 09 SECONDS WEST, 41.15 FEET;
11. NORTH 48 DEGREES 56 MINUTES 27 SECONDS WEST, 137.25 FEET;
12. SOUTH 88 DEGREES 57 MINUTES 25 SECONDS WEST, 67.60 FEET,

13. SOUTH 10 DEGREES 32 MINUTES 54 SECONDS WEST, 26.12 FEET,
14. SOUTH 74 DEGREES 19 MINUTES 35 SECONDS WEST, 89.75 FEET,
15. NORTH 75 DEGREES 22 MINUTES 06 SECONDS WEST, 55.08 FEET,
16. NORTH 62 DEGREES 35 MINUTES 03 SECONDS WEST, 10.27 FEET,
THENCE, LEAVING WATSON BRANCH WITH A THE CENTERLINE OF A DRAINAGE DITCH AND SEVERING SAID LOT 24 OF FINAL PLAN OF WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, THE FOLLOWING SEVEN BEARINGS AND DISTANCES:
1. NORTH 39 DEGREES 40 MINUTES 55 SECONDS EAST, 27.30 FEET,
2. SOUTH 89 DEGREES 07 MINUTES 57 SECONDS EAST, 31.47 FEET,
3. NORTH 25 DEGREES 32 MINUTES 12 SECONDS EAST, 70.78 FEET,
4. NORTH 10 DEGREES 00 MINUTES 40 SECONDS WEST, 49.37 FEET,
5. NORTH 54 DEGREES 59 MINUTES 41 SECONDS EAST, 103.02 FEET,
6. NORTH 40 DEGREES 36 MINUTES 36 SECONDS EAST, 74.71 FEET,
7. NORTH 53 DEGREES 28 MINUTES 05 SECONDS EAST, 164.68 FEET TO THE POINT OF BEGINNING AND CONTAINING 754,942 SQUARE FEET OR 17.33 ACRES, MORE OR LESS.

and

LOT 32
MAP 79, PARCEL 101.00

A TRACT OF LAND IN THE NINTH CIVIL DISTRICT OF WILLIAMSON COUNTY, CITY OF FRANKLIN, TENNESSEE, AND BEING LOT 32 AS SHOWN ON THE FINAL PLAT ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2, REVISION 1, RESUBDIVISION OF LOT 31” OF RECORD IN PLAT BOOK P62, PAGE 45, REGISTER'S OFFICE FOR WILLIAMSON COUNTY TENNESSEE (R.O.W.C.T.). AND BEING GENERALLY BOUNDED ON THE NORTH BY LOT 10 AS SHOWN ON PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2” OF RECORD IN PLAT BOOK 13, PAGE 85, R.O.W.C.T., ON THE EAST BY RIVERSIDE DRIVE (IMPROVED AND UNIMPROVED ROAD, RIGHT-OF-WAY WIDTH VARIES), ON THE SOUTH BY OAK MEADOW DRIVE (RIGHT-OF-WAY WITH VARIES), AND ON THE WEST BY LOT 2 AS SHOWN ON THE PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, (RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11) OF RECORD IN PLAT BOOK 29, PAGE 139, R.O.W.C.T. AND LOT 31 ON SAID PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2, REVISION 1, RESUBDIVISION OF LOT 31” OF RECORD IN PLAT BOOK P62, PAGE 45, R.OW.C.T., AND BEING DESCRIBED ACCORDING TO A SURVEY DATED OCTOBER 15, 2015 AND PREPARED BY KEVIN L BIRDWELL, R.L.S. NO. 1797 WHOSE ADDRESS IS RAGAN SMITH ASSOCIATES, 315 WOODLAND STREET, NASHVILLE, TN 37206 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT AN IRON ROD (OLD) WITH CAP STAMPED “RAGAN-SMITH ASSOCIATES” (RSA), SAID PIN BEING IN THE EASTERLY RIGHT-OF-WAY OF SOUTH ROYAL OAKS BOULEVARD AND BEING THE NORTH END OF A CURVE AT THE INTERSECTION OF THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND THE NORTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND BEING A WESTERLY CORNER OF LOT 30 OF THE FINAL PLAT ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2 OF RECORD IN PLAT BOOK P43, PAGE 40, R.O.W.C.T.;
THENCE, WITH A CURVE TO THE LEFT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 73.83 FEET, A CENTRAL ANGLE OF 84 DEGREES 35 MINUTES 53 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 06 DEGREES 29 MINUTES 38 SECONDS EAST, 67.30 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA) IN THE NORTHERLY RIGHT-OF-WAY OF OAK MEADOW DRIVE (RIGHT-OF-WAY WIDTH VARIES);
THENCE, CONTINUING WITH SAID RIGHT-OF-WAY AND WITH THE SOUTHERLY LINE OF SAID LOT 30 THE FOLLOWING TWO CALLS:
1. SOUTH 48 DEGREES 47 MINUTES 29 SECONDS EAST, 157.42 FEET IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 750.00 FEET, AN ARC LENGTH OF 251.97 FEET, A CENTRAL ANGLE OF 19 DEGREES 14 MINUTES 55 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 58 DEGREES 24 MINUTES 57 SECONDS EAST, 250.78 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA) AT THE SOUTHWEST CORNER OF LOT 31 ON THE PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2, REVISON 1, RESUBDIVISION OF LOT 31” OF RECORD IN PLAT BOOK P62, PAGE 45, R.O.W.C.T.;
THENCE, CONTINUING WITH SAID RIGHT-OF-WAY AND WITH THE SOUTHERLY LINE OF SAID LOT 31 THE FOLLOWING THREE CALLS:
1. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 750.00 FEET, AN ARC LENGTH OF 116.20 FEET,

A CENTRAL ANGLE OF 08 DEGREES 52 MINUTES 38 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 72 DEGREES 28 MINUTES 44 SECONDS EAST, 116.09 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. SOUTH 76 DEGREES 55 MINUTES 03 SECONDS EAST, 811.13 FEET TO AN IRON ROD (OLD);
3. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 607.96 FEET, AN ARC LENGTH OF 43.08 FEET, A CENTRAL ANGLE OF 04 DEGREES 03 MINUTES 37 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 74 DEGREES 53 MINUTES 15 SECONDS EAST, 43.07 FEET TO A PK NAIL (OLD) IN THE CENTERLINE OF AN ACCESS DRIVE, THE **POINT OF BEGINNING** OF THE HEREIN DESCRIBED TRACT OF LAND AND PROCEEEDING AS FOLLOWS:
4. THENCE, LEAVING SAID RIGHT-OF-WAY OF OAK MEADOW DRIVE WITH THE CENTERLINE OF SAID ACCESS DRIVE AND THE EAST LINE OF SAID LOT 31 ON THE PLAN ENTITLED "WATSON GLEN SUBDIVISION, SECTION 2, REVISON 1, RESUBDIVISION OF LOT 31" OF RECORD IN PLAT BOOK P62, PAGE 45, R.O.W.C.T.;NORTH 06 DEGREES 14 MINUTES 29 SECONDS EAST, 564.50 FEET TO A PK NAIL (OLD) IN THE SOUTH LINE OF LOT 2 AS SHOWN ON THE PLAN ENTITLED "WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, (RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11);
THENCE, WITH THE SOUTH AND EAST LINE OF SAID LOT 2, THE FOLLOWING TWO BEARINGS AND DISTANCES:
1. SOUTH 83 DEGREES 35 MINUTES 44 SECONDS EAST, 73.68 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. NORTH 06 DEGREES 24 MINUTES 16 SECONDS EAST, 708.89 FEET TO PUNCH HOLE IN A LIGHT BASE IN THE SOUTH LINE OF SAID LOT 10 OF FINAL PLAT ENTITLED "WATSON GLEN SUBDIVISION, SECTION 2";
THENCE, WITH THE SOUTH LINE OF SAID LOT 10, SOUTH 83 DEGREES 32 MINUTES 35 SECONDS EAST, 377.77 FEET TO CONCRETE MONUMENT OLD IN THE WESTERLY RIGHT-OF-WAY OF RIVERSIDE DRIVE (RIGHT-OF-WAY WIDTH VARIES);
THENCE, WITH THE WESTERLY RIGHT-OF-WAY OF RIVERSIDE DRIVE (IMPROVED AND UNIMPROVED ROAD), THE FOLLOWING FOUR CALLS:
1. SOUTH 07 DEGREES 40 MINUTES 29 SECONDS WEST, 577.88 FEET TO AN IRON ROD (OLD);
2. SOUTH 04 DEGREES 01 MINUTES 39 SECONDS WEST, 310.67 FEET TO AN IRON ROD (OLD);
3. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 11300.00 FEET, AN ARC LENGTH OF 470.04 FEET, A CENTRAL ANGLE OF 02 DEGREES 23 MINUTES 00 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 05 DEGREES 13 MINUTES 09 SECONDS WEST, 470.01 FEET TO A CONCRETE MONUMENT (OLD);
4. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 11300.00 FEET, AN ARC LENGTH OF 112.73 FEET, A CENTRAL ANGLE OF 00 DEGREES 34 MINUTES 18 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 06 DEGREES 41 MINUTES 48 SECONDS WEST, 112.73 FEET TO A CONCRETE MONUMENT (OLD);
THENCE, LEAVING SAID RIGHT-OF-WAY OF RIVERSIDE DRIVE AND WITH THE NORTH RIGHT-OF-WAY OF OAK MEADOW DRIVE (RIGHT-OF-WAY WIDTH VARIES) THE FOLLOWING TWO CALLS:
1. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 123.89 FEET, A CENTRAL ANGLE OF 141 DEGREES 58 MINUTES 19 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 77 DEGREES 58 MINUTES 06 SECONDS WEST, 94.54 FEET TO AN IRON ROD (OLD);
2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 607.96 FEET, AN ARC LENGTH OF 443.66 FEET, A CENTRAL ANGLE OF 41 DEGREES 48 MINUTES 42 SECONDS, AND A CHORD BEARING AND DISTANCE OF NORTH 51 DEGREES 57 MINUTES 06 SECONDS WEST, 433.88 FEET TO THE **POINT OF BEGINNING** AND CONTAINING 569,021 SQUARE FEET OR 13.06 ACRES, MORE OR LESS.

SECTION II: That the attached Location Map shall serve the purpose of further delimiting the geographical boundaries as described by this Ordinance.

SECTION III. BE IT FINALLY ORDAINED by the Board of Mayor and Aldermen of the City of Franklin, Tennessee, that this Ordinance shall take effect from and after its passage on third and final reading, the health, safety, and welfare of the citizens requiring it.

ATTEST:

By: _____
Eric Stuckey
City Administrator/Recorder

CITY OF FRANKLIN, TENNESSEE:

By: _____
Dr. Ken Moore
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

PLANNING COMMISSION RECOMMENDED: _____

PASSED FIRST READING: _____

PUBLIC HEARING HELD: _____

PASSED SECOND READING: _____

PASSED THIRD READING: _____

F i s c h b a c h
Transportation Group, LLC
Traffic Engineering and Planning

Traffic Impact Study

Epoch Apartments
Oak Meadow Drive
Franklin, TN

Prepared March 2016
(Revised April 2016)
For Epoch Residential

FTG, LLC
P.O. Box 682736
Franklin, TN 37068
(615) 771-8022 phone
Gillian@FTGtraffic.com

Traffic Impact Study

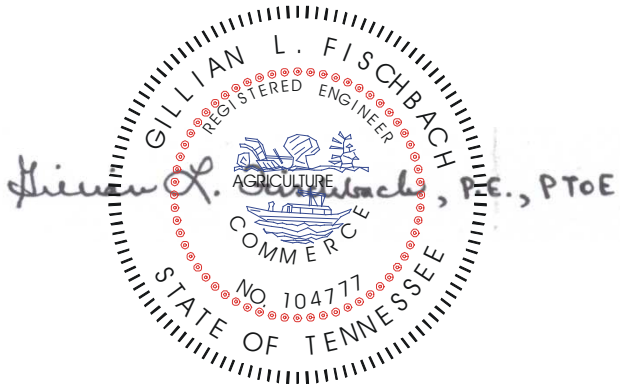
Epoch Apartments
Oak Meadow Drive

Franklin, Tennessee

Prepared March 2016
(Revised April 2016)

PREPARED FOR:
Epoch Residential
359 Carolina Avenue
Winter Park, FL 32789

PREPARED BY:
Ms. Gillian L. Fischbach, P.E., PTOE
Fischbach Transportation Group (FTG, LLC)
P.O. Box 682736
Franklin, TN 37068
Phone: (615) 771-8022
FTG Project Number: 10728



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1. INTRODUCTION

This traffic study has been prepared in order to identify the traffic impacts of a multi-family residential development that is proposed to be constructed on the north and south sides of Oak Meadow Drive, east of S. Royal Oaks Boulevard, in Franklin, Tennessee.

For the purposes of this study, existing and background traffic volumes were established, and capacity analyses were conducted for these conditions. Also, trip generation calculations were performed, and the trips which are expected to be generated by the proposed project were distributed to the roadway system and added to the background traffic volumes. The roadways and intersections which provide access to the site were then re-evaluated to determine the traffic impacts of the proposed project. Access needs for the project were evaluated, and the necessary roadway and/or traffic control improvements were identified. This report presents the results of these analyses and the subsequent recommendations.

It is important to note that the scope of this Traffic Impact Study was provided by the City of Franklin Engineering Department and their third-party private consultant, Neel-Schaffer, Inc. The approved scope is included in in Appendix A.

2. PROJECT DESCRIPTION

The location of the proposed project is shown in Figure 1. As shown, the project site is located on the north and south sides of Oak Meadow Drive, east of S. Royal Oaks Boulevard, in Franklin, Tennessee. The current project site plan is shown in Figure 2. As shown, the proposed plan includes 115 apartments on the south side of Oak Meadow Drive and 240 apartments on the north side of Oak Meadow Drive. Access for the southern portion of the site will be provided at two locations on Oak Meadow Drive, directly opposite two existing accesses for the Home Depot shopping center on the north side of Oak Meadow Drive. Access for the northern portion of the site will be provided at one location on the eastern access for the Home Depot shopping center on the north side of Oak Meadow Drive. Also, secondary access will be provided at the existing terminus of Riverside Drive.

In large part, economic and market considerations will dictate the pace and timing with which the proposed project is actually completed. The analyses conducted within this study are based on the estimation that the entire project will be completed within two years.

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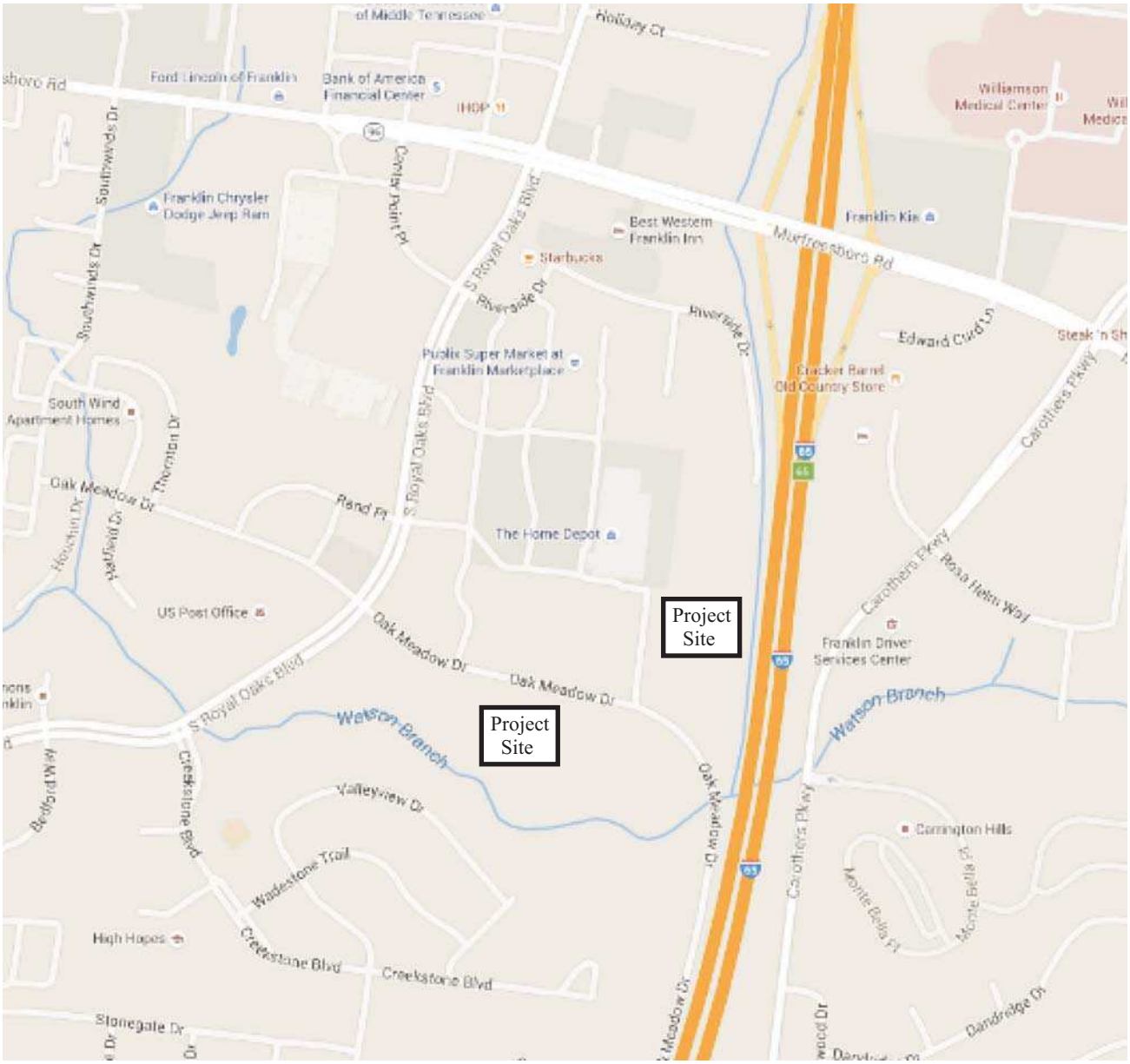

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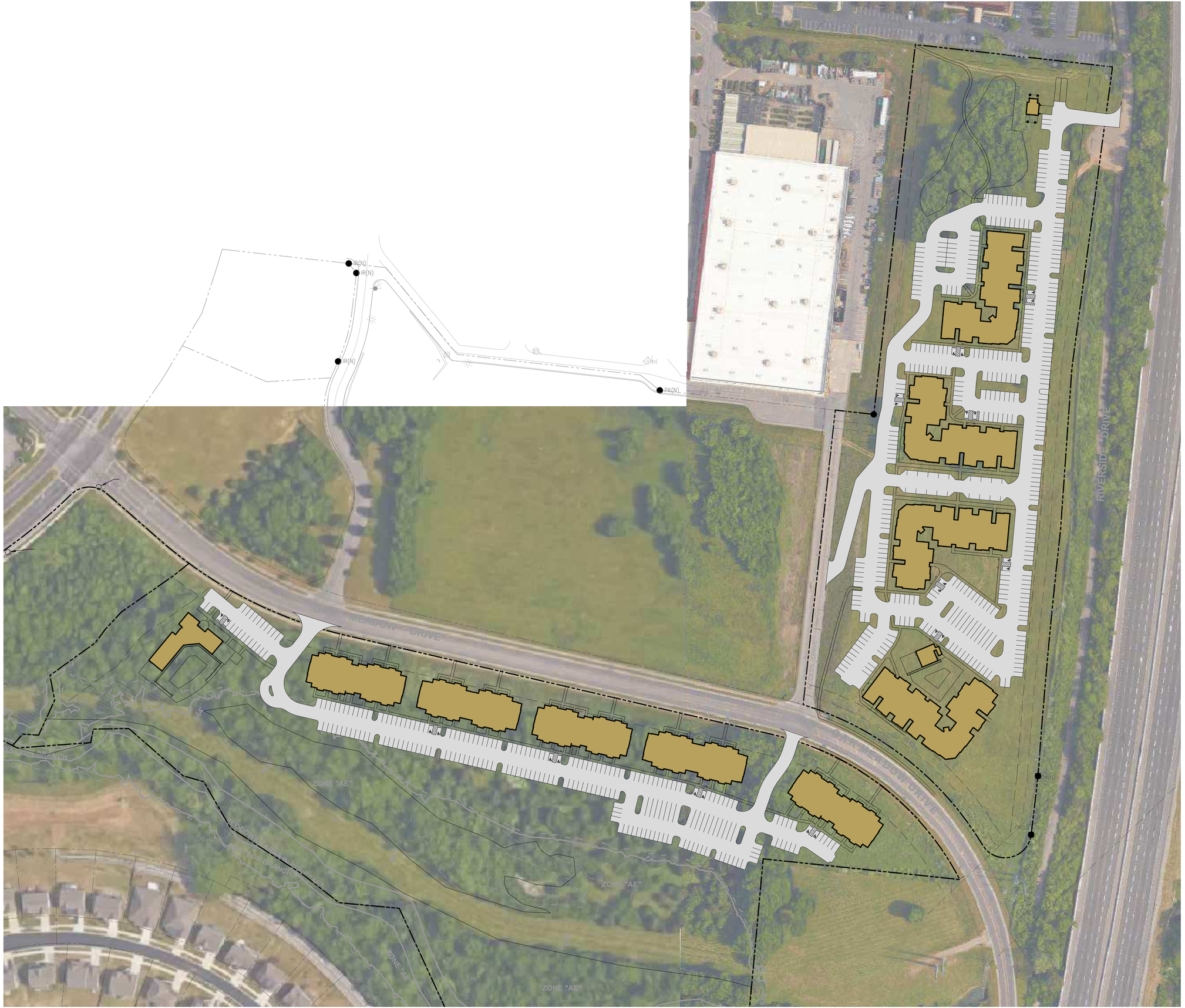
Figure 1.
Location of the Project Site


IR(N)
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PK(N)
RIVERSIDE DRIVE
GARNET MEADOW DRIVE
GARNET MEADOW DRIVE
GARNET MEADOW DRIVE
WATSON BRANCH
WATSON BRANCH
ZONE "AE"
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ZONE "AE"

3. EXISTING TRAFFIC VOLUMES

In order to quantify the impact of the traffic that will be generated by the proposed project, peak hour traffic volumes were counted at the following locations:

1. Oak Meadow Drive and the project accesses
2. S. Royal Oaks Boulevard and Oak Meadow Drive
3. S. Royal Oaks Boulevard and Rand Place / Access for Home Depot
4. S. Royal Oaks Boulevard and Riverside Drive / Center Point Place

Also, the City of Franklin requested that peak hour traffic counts be collected for signal timing purposes at the following intersections:

5. Murfreesboro Road and Royal Oaks Boulevard
6. Murfreesboro Road and the Ramps for Southbound I-65
7. Murfreesboro Road and the Ramps for Northbound I-65

This data was collected during the morning and afternoon peak hours on typical weekdays in February 2016 when schools were in session. The raw traffic volumes are included in Appendix B. The existing laneage at the intersections within the study area is shown in Figure 3, and the existing peak hour traffic volumes are shown in Figure 4.

Using the existing peak hour traffic volumes shown in Figure 4, capacity analyses were conducted for the intersections counted. Specifically, in order to identify current peak hour levels of operation within the study area, the capacity calculations were performed according to the methods outlined in the Highway Capacity Manual 2010 (HCM2010). These analyses result in the determination of a Level of Service (LOS), which is a measure of evaluation is used to describe how well an intersection or roadway operates. LOS A represents free flow traffic operations, and LOS F suggests that the traffic demand exceeds the available capacity. In an urbanized area, LOS D is typically considered to be the minimum acceptable LOS. Table 1 presents the descriptions of LOS for signalized intersections, and Table 2 presents the descriptions of LOS for unsignalized intersections.

It is important to note that the City of Franklin Engineering Department provided the Synchro software files that were used to identify existing operations at the signalized intersections within the study area. Specifically, the files were updated to include the February 2016 traffic volumes. Also, the files were updated to reflect the recently-approved City ordinance that prohibits right-turns-on-red for the northbound right turns on S. Royal Oaks Boulevard at Murfreesboro Road.

The results of the capacity analyses for the existing peak hour traffic volumes are shown in Table 3, and Appendix C includes the capacity analyses worksheets.

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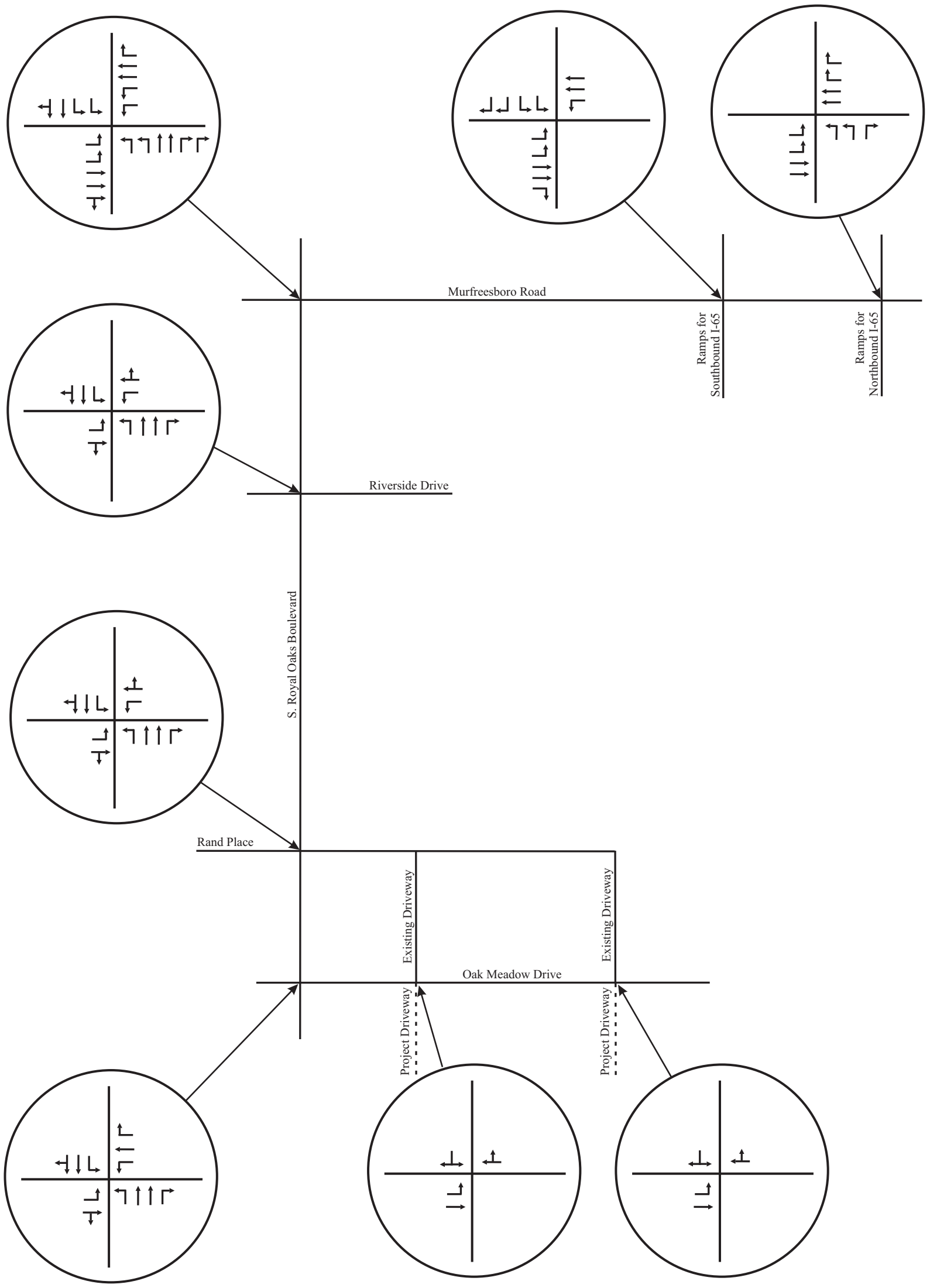

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Figure 3.
Existing Laneage at the Intersections within the Study Area

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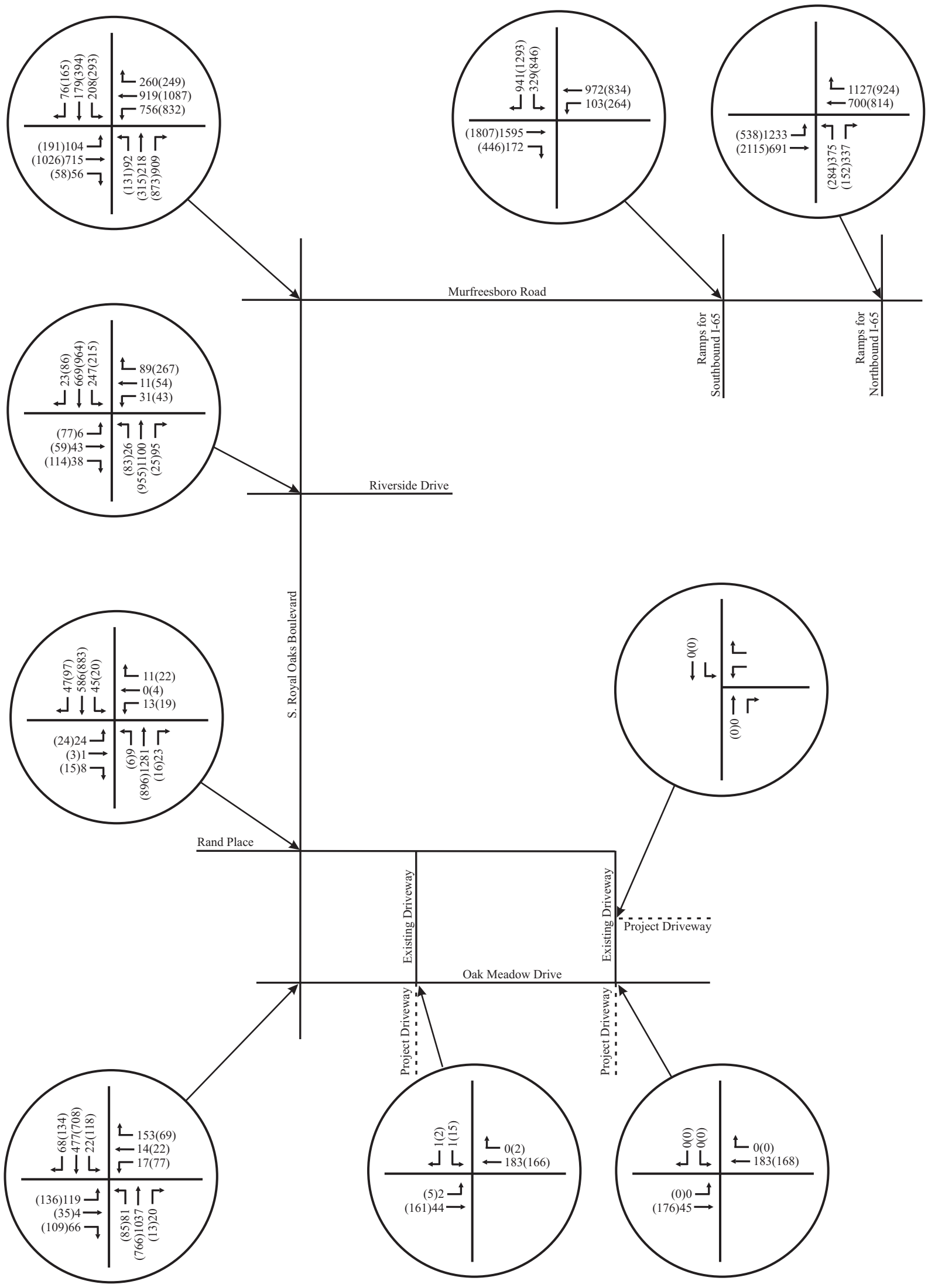

No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 4.
Existing Peak Hour Traffic Volumes within the Study Area

TABLE 1. DESCRIPTIONS OF LOS FOR SIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay per Vehicle (sec)
A	Operations with very low control delay. Progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	Operations with stable flows. This generally occurs with good progression, short cycle lengths, or both. More vehicles stop than for LOS A, causing higher levels of average delay.	> 10 and ≤ 20
C	Operations with stable flow. Occurs with fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	> 20 and ≤ 35
D	Approaching unstable flow. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop.	> 35 and ≤ 55
E	Unstable flow. In many cases, this is considered to be the limit for acceptable delay. These high delays generally indicate poor progression, long cycle lengths, and high v/c ratios.	> 55 and ≤ 80
F	Unacceptable delay. This condition often occurs with oversaturation or with high v/c ratios. Poor progression and long cycle lengths may also cause such delay levels.	> 80

Source: Highway Capacity Manual 2010 (HCM2010)

TABLE 2. DESCRIPTIONS OF LOS FOR UNSIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay (sec/veh)
A	Minimal delay	≤ 10
B	Brief delay	> 10 and ≤ 15
C	Average delay	> 15 and ≤ 25
D	Significant delay	> 25 and ≤ 35
E	Long delay	> 35 and ≤ 50
F	Extreme delay	> 50

Source: Highway Capacity Manual 2010 (HCM 2010)

TABLE 3. EXISTING PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
Oak Meadow Drive and the Eastern Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
Oak Meadow Drive and the Western Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	32 feet	LOS B	47 feet
	Northbound Thrus	LOS B	308 feet	LOS B	268 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	12 feet	LOS A	64 feet
	Southbound Thrus/Right Turns	LOS A	130 feet	LOS C	356 feet
	Eastbound Left Turns	LOS D	120 feet	LOS D	137 feet
	Eastbound Thrus/Right Turns	LOS B	13 feet	LOS C	63 feet
	Westbound Left Turns	LOS C	27 feet	LOS D	82 feet
	Westbound Thrus	LOS D	25 feet	LOS D	35 feet
	Westbound Right Turns	LOS B	88 feet	LOS A	33 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS D	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS B	1 veh

	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS B	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	10 feet	LOS B	55 feet
	Northbound Thrus	LOS B	386 feet	LOS C	577 feet
	Northbound Right Turns	LOS A	24 feet	LOS A	0 feet
	Southbound Left Turns	LOS D	142 feet	LOS C	80 feet
	Southbound Thrus/Right Turns	LOS A	246 feet	LOS A	411 feet
	Eastbound Left Turns	LOS E	17 feet	LOS F	209 feet
	Eastbound Thrus/Right Turns	LOS E	75 feet	LOS D	82 feet
	Westbound Left Turns	LOS E	58 feet	LOS D	66 veh
	Westbound Thrus/Right Turns	LOS C	25 feet	LOS D	258 veh
	Overall Intersection	**LOS F**		**LOS F**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	80 feet	LOS E	141 feet
	Eastbound Thrus / Right Turns	LOS D	306 feet	LOS D	431 feet
	Westbound Left Turns	LOS D	412 feet	LOS F	499 feet
	Westbound Thrus	LOS D	539 feet	LOS D	492 feet
	Westbound Right Turns	LOS A	80 feet	LOS B	120 feet
	Northbound Left Turns	LOS D	68 feet	LOS E	92 feet
	Northbound Thrus	LOS D	142 feet	LOS D	211 feet
	Northbound Right Turns	LOS D	598 feet	LOS D	623 feet
	Southbound Left Turns	LOS E	148 feet	LOS F	242 feet

	Southbound Thrus / Right Turns	LOS D	141 feet	LOS E	398 feet
	Overall Intersection	**LOS D**		**LOS E**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	346 feet	LOS E	612 feet
	Eastbound Right Turns	LOS A	51 feet	LOS C	265 feet
	Westbound Left Turns	LOS E	156 feet	LOS F	465 feet
	Westbound Thrus	LOS B	273 feet	LOS C	337 feet
	Southbound Left Turns	LOS D	164 feet	LOS D	465 feet
	Southbound Right Turns	LOS E	617 feet	LOS F	1065 feet
	Overall Intersection	**LOS C**		**LOS E**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	914 feet	LOS E	341 feet
	Eastbound Thrus	LOS A	71 feet	LOS C	368 feet
	Westbound Thrus	LOS D	337 feet	LOS C	305 feet
	Westbound Right Turns	LOS C	502 feet	LOS A	150 feet
	Northbound Left Turns	LOS F	302 feet	LOS E	148 feet
	Northbound Right Turns	LOS C	225 feet	LOS D	97 feet
	Overall Intersection	**LOS E**		**LOS C**	

4. PROJECTION OF BACKGROUND TRAFFIC VOLUMES

In order to account for the traffic growth which will occur within the study area because of typical growth, background traffic volumes were established for the intersections within the study area. Specifically, in order to account for typical growth within the study area, consideration was given to the historical traffic volumes near the project site. The Tennessee Department of Transportation (TDOT) conducts an annual count program throughout the state. This count program includes the annual collection of average daily traffic (ADT) counts at numerous fixed locations. As shown in Table 4, the daily traffic volumes within the study area have increased 2.65% per year since 2006. Based on this information, for the purposes of this study, the existing traffic volumes at the intersections within the study area were increased by 8% to represent initial background traffic volumes in the Year 2018, as shown in Figure 5A.

TABLE 4. HISTORICAL TRAFFIC VOLUMES IN THE STUDY AREA

Year	Station 164 S. Royal Oaks Blvd ADT	Annual Growth	
2006	18,274		
2007	17,787	-2.66%	
2008	20,374	14.54%	
2009	19,666	-3.48%	
2010	19,324	-1.74%	
2011	19,090	-1.21%	
2012	19,435	1.81%	
2013	20,343	4.67%	
2014	22,118	8.73%	**Overall Growth**
2015	22,638	2.35%	**2.65%**

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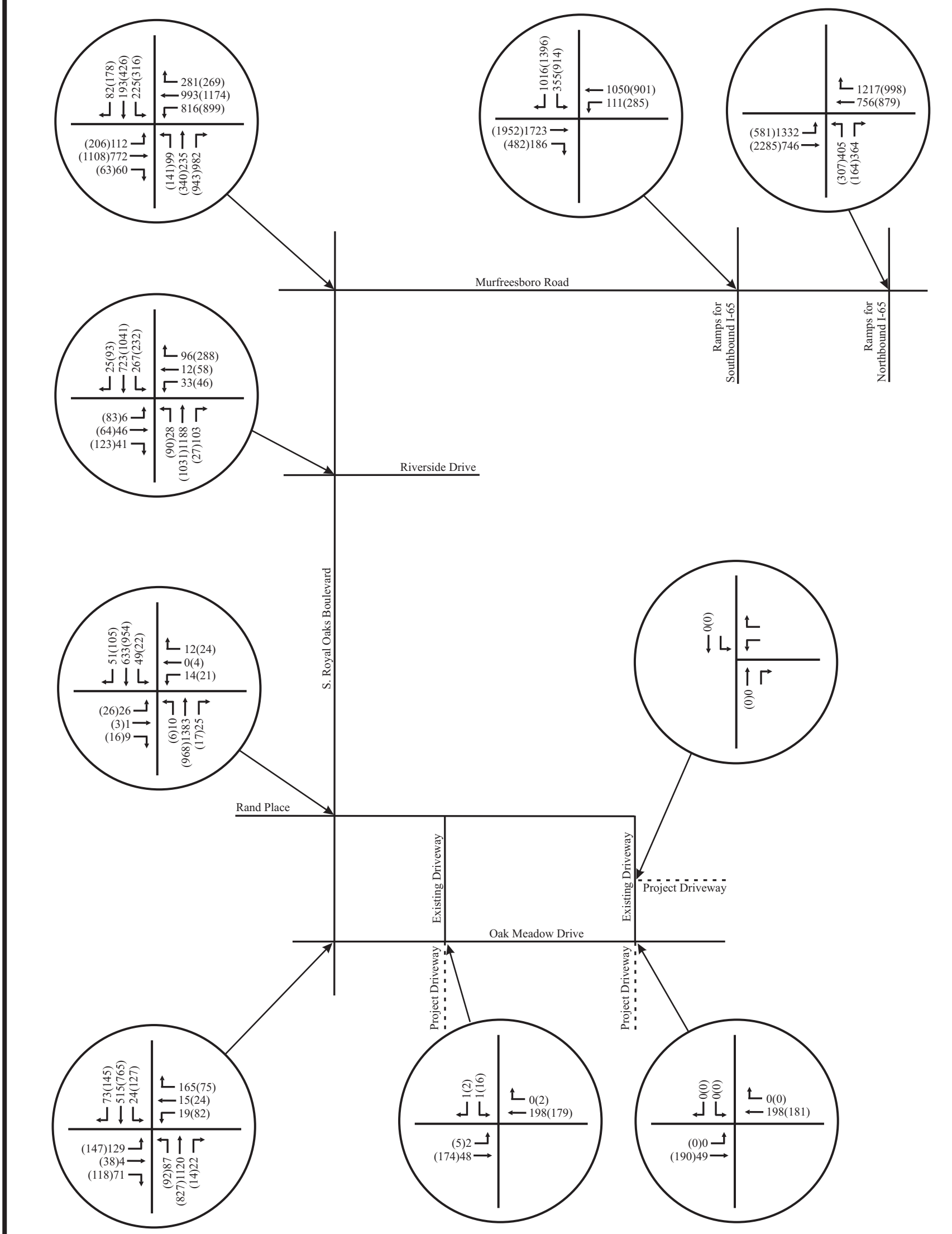

No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 5A.
Initial Background Peak Hour Traffic Volumes within the Study Area

It is important to note that a day care center is under construction on the north side of S. Royal Oaks Boulevard at Mack Hatcher Parkway, southwest of the proposed project. It is likely that a significant portion of the traffic that will be generated by the day care center will be pass-by traffic that is already traveling on the S. Royal Oaks Boulevard corridor. The 8% growth rate applied to the existing traffic volumes will account for the additional traffic that will be generated by the day care center.

Also, it is important to note that an assisted living facility with 208 beds is under construction on the north side of Oak Meadow Drive, opposite the southern project site for the proposed project. For the purposes of this study, trip generation calculations were conducted in order to identify how much traffic is expected to be generated by the assisted living facility. Trip generation data for daily and peak hour trips were identified from Trip Generation, Ninth Edition, which was published by the Institute of Transportation Engineers (ITE) in 2012. Table 5 presents the daily and peak hour trip generations, and these calculations are included in Appendix D.

TABLE 5. TRIP GENERATION (SOMERBY ASSISTED LIVING FACILITY)

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Assisted Living Facility (LUC 254)	208 beds	570	34	13	30	47

Figures 5B and 5C include the directional distribution and assignment of peak hour traffic volumes that are expected to be generated by the assisted living facility.

The peak hour traffic volumes shown in Figures 5B and 5C were added to the traffic volumes shown in Figure 5A in order to establish the final background traffic volumes shown in Figure 5D. Using the background peak hour traffic volumes, capacity analyses were conducted for the intersections within the study area. For these analyses, it was assumed that all existing laneage and traffic control will be maintained and no improvements will be provided. The results of the capacity analyses for the background peak hour traffic volumes are shown in Table 5, and Appendix C includes the capacity analyses worksheets. These analyses indicate that the background conditions are consistent with the existing conditions within the study area.

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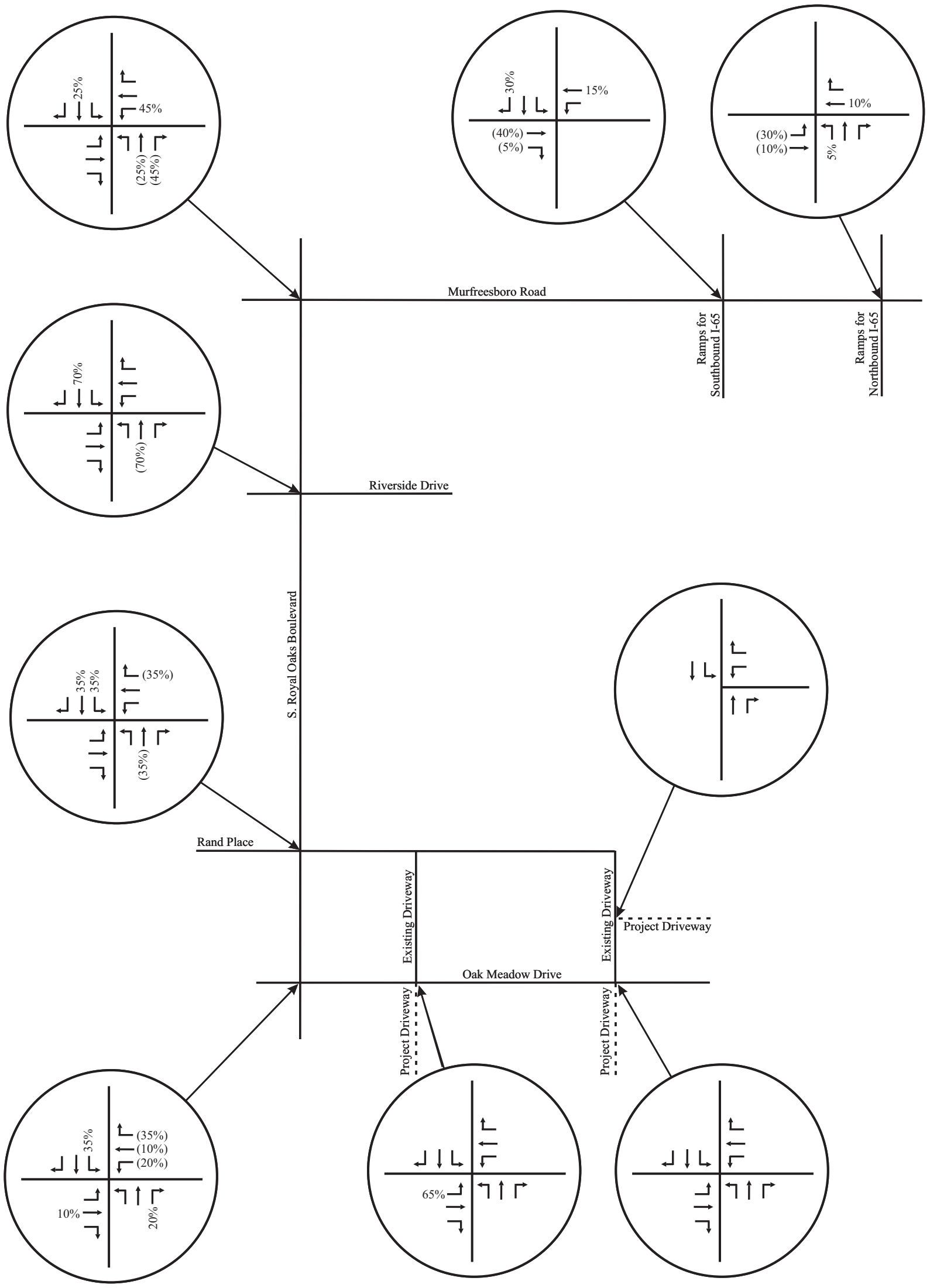

No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 5B.
Directional Distribution of Peak Hour Traffic Generated by the Somerby Assisted Living Facility

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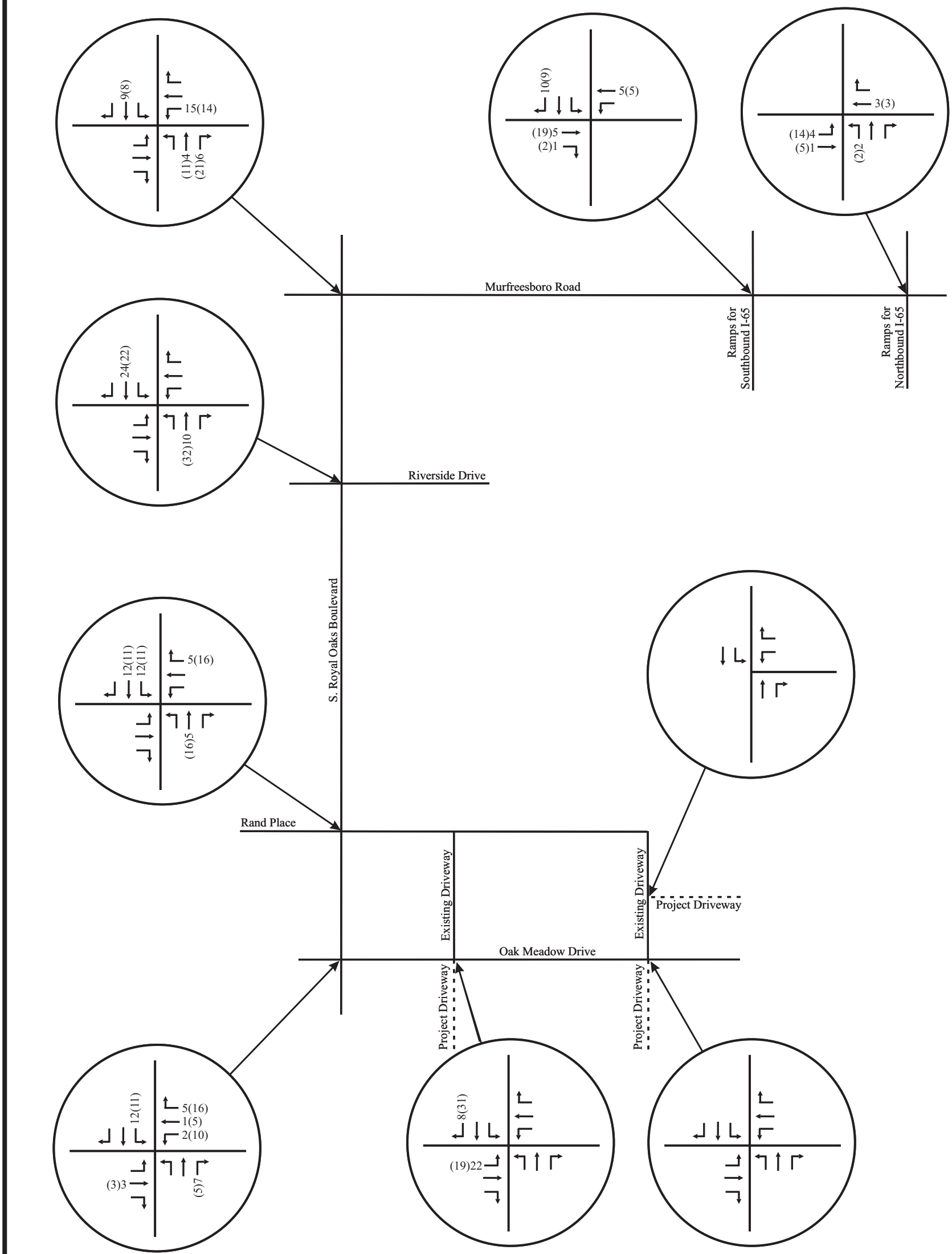

No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 5C.
Peak Hour Traffic Generated by the Somerby Assisted Living Facility

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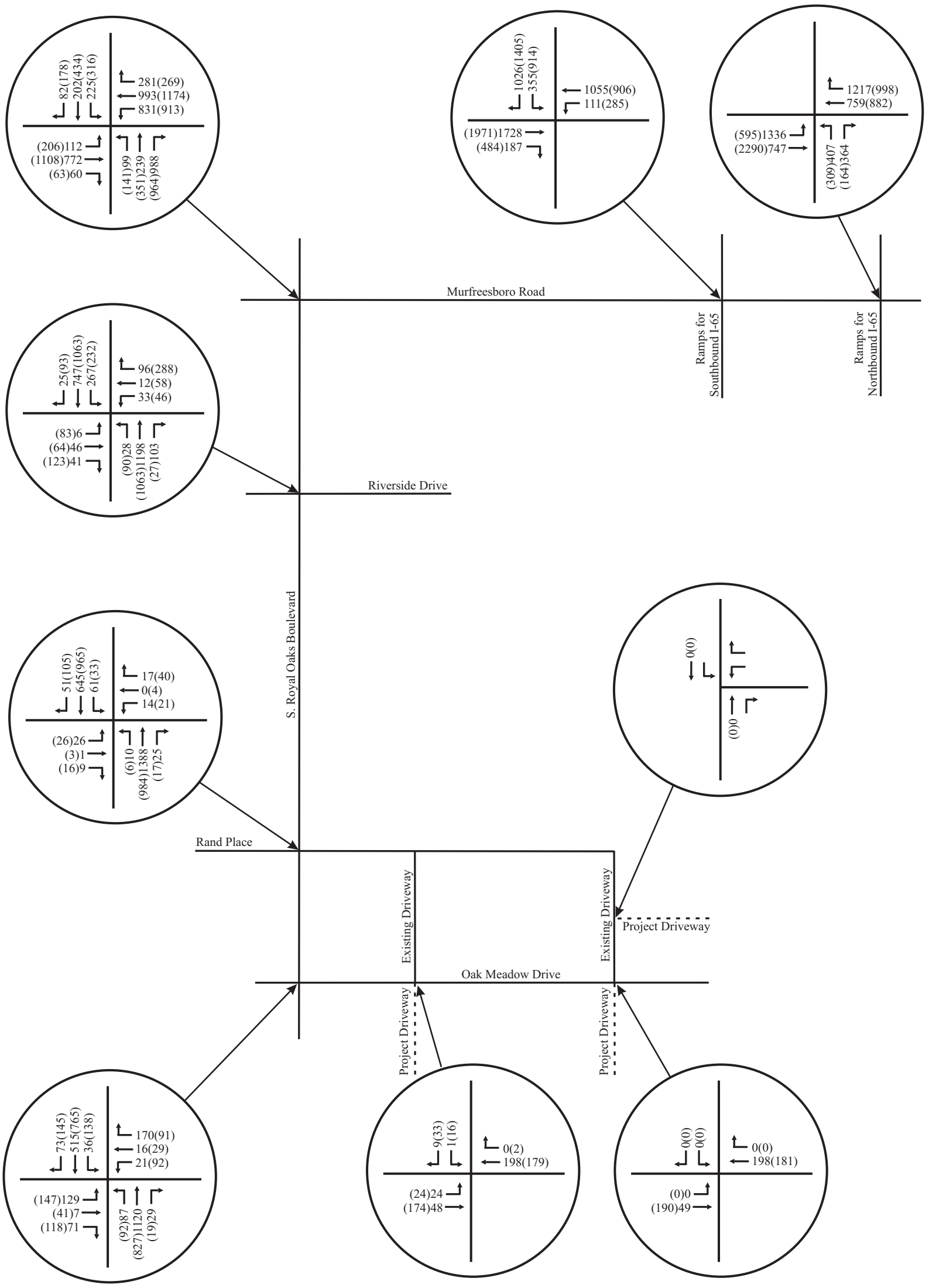


No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 5D.
Final Background Peak Hour Traffic Volumes within the Study Area

TABLE 5. BACKGROUND PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
Oak Meadow Drive and the Eastern Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
Oak Meadow Drive and the Western Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	35 feet	LOS C	56 feet
	Northbound Thrus	LOS B	351 feet	LOS B	308 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	13 feet	LOS B	78 feet
	Southbound Thrus/Right Turns	LOS B	147 feet	LOS C	423 feet
	Eastbound Left Turns	LOS D	127 feet	LOS D	142 feet
	Eastbound Thrus/Right Turns	LOS B	15 feet	LOS D	80 feet
	Westbound Left Turns	LOS C	30 feet	LOS D	92 feet
	Westbound Thrus	LOS D	27 feet	LOS D	41 feet
	Westbound Right Turns	LOS B	110 feet	LOS A	37 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS D	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS C	1 veh

	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS C	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	10 feet	LOS B	58 feet
	Northbound Thrus	LOS B	459 feet	LOS D	692 feet
	Northbound Right Turns	LOS A	28 feet	LOS A	0 feet
	Southbound Left Turns	LOS E	163 feet	LOS D	114 feet
	Southbound Thrus/Right Turns	LOS A	336 feet	LOS B	571 feet
	Eastbound Left Turns	LOS E	17 feet	LOS F	214 feet
	Eastbound Thrus/Right Turns	LOS E	79 feet	LOS D	88 feet
	Westbound Left Turns	LOS E	61 feet	LOS F	70 veh
	Westbound Thrus/Right Turns	LOS C	24 feet	LOS D	293 veh
	Overall Intersection	**LOS F**		**LOS F**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	85 feet	LOS E	151 feet
	Eastbound Thrus / Right Turns	LOS D	335 feet	LOS D	475 feet
	Westbound Left Turns	LOS E	435 feet	LOS F	521 feet
	Westbound Thrus	LOS D	554 feet	LOS D	521 feet
	Westbound Right Turns	LOS A	109 feet	LOS B	130 feet
	Northbound Left Turns	LOS E	72 feet	LOS E	100 feet
	Northbound Thrus	LOS D	150 feet	LOS D	237 feet
	Northbound Right Turns	LOS D	632 feet	LOS D	692 feet
	Southbound Left Turns	LOS E	159 feet	LOS F	272 feet

	Southbound Thrus / Right Turns	LOS D	159 feet	LOS E	465 feet
	Overall Intersection	**LOS D**		**LOS E**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	388 feet	LOS E	672 feet
	Eastbound Right Turns	LOS A	50 feet	LOS C	295 feet
	Westbound Left Turns	LOS E	163 feet	LOS F	520 feet
	Westbound Thrus	LOS B	294 feet	LOS C	407 feet
	Southbound Left Turns	LOS D	178 feet	LOS D	515 feet
	Southbound Right Turns	LOS F	738 feet	LOS F	1235 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	1028 feet	LOS E	340 feet
	Eastbound Thrus	LOS A	76 feet	LOS C	518 feet
	Westbound Thrus	LOS D	372 feet	LOS C	467 feet
	Westbound Right Turns	LOS C	573 feet	LOS B	311 feet
	Northbound Left Turns	LOS F	337 feet	LOS E	218 feet
	Northbound Right Turns	LOS D	341 feet	LOS D	190 feet
	Overall Intersection	**LOS F**		**LOS C**	

5. IMPACTS OF PROPOSED DEVELOPMENT

5.1 TRIP GENERATION

Trip generation calculations were conducted in order to identify how much traffic will be generated by the proposed project. Trip generation data for daily and peak hour trips were identified from Trip Generation, Ninth Edition, which was published by the Institute of Transportation Engineers (ITE) in 2012. Table 6 presents the daily and peak hour trip generations for proposed townhomes, and these calculations are included in Appendix D.

TABLE 6. TRIP GENERATION

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Multi-Family (LUC 220) **South Site**	115 units	764	12	47	46	25
Multi-Family (LUC 220) **North Site**	240 units	1,596	24	98	97	52
TOTAL	**355 units**	**2,360**	**36**	**145**	**143**	**77**

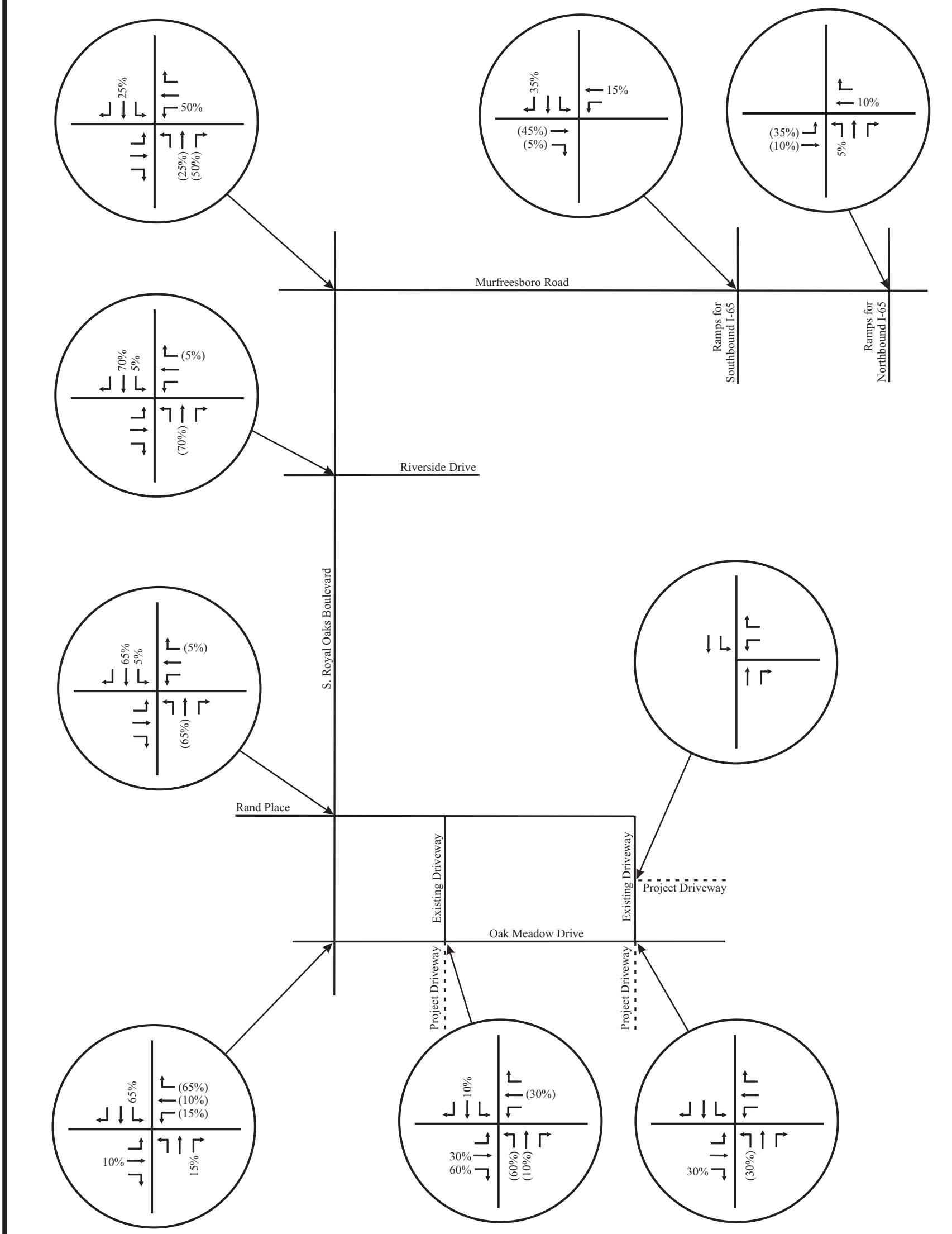
5.2 TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

For the purposes of this study, it was estimated that the trips generated by the proposed project will access the project site according to the directional distribution shown in Figures 6A and 6B. It is important to note that these directional distributions were prepared with input and approval from the City of Franklin Engineering Department and their third-party private consultant, Neel-Schaffer, Inc. The development of these distributions was based on the following factors:

- existing land use characteristics,
- the directions of approach of the existing traffic,
- the access proposed for the project, and
- the locations of population centers in the area.

The peak hour trip generations and directional distributions were used to add the site-generated trips to the roadway system. Figures 7A, 7B, and 7C include the peak hour traffic volumes that are expected to be generated by the proposed project.

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning

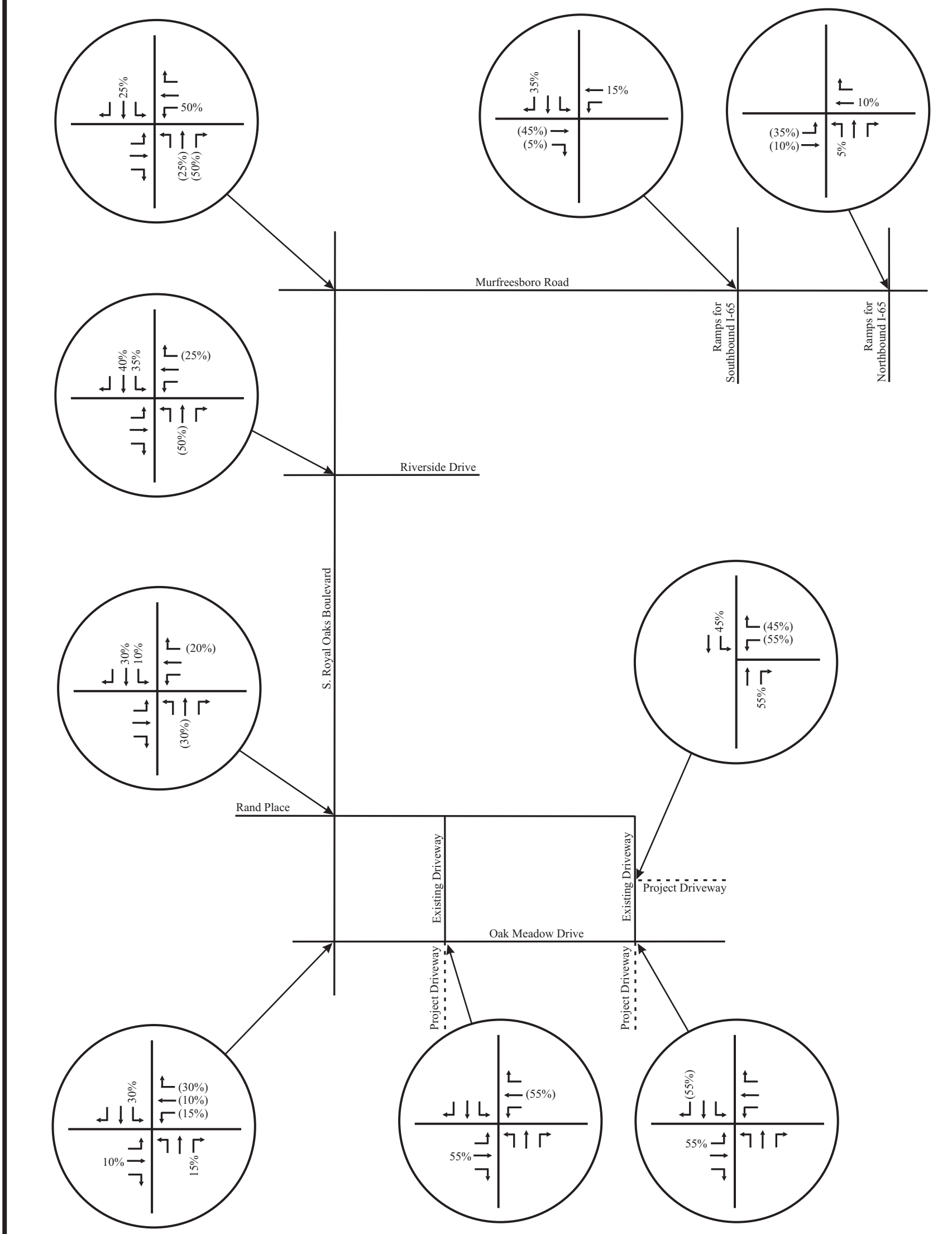


No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6A.
Directional Distribution of Peak Hour Traffic Volumes Generated by the Proposed Apartments (Southern Site)

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning

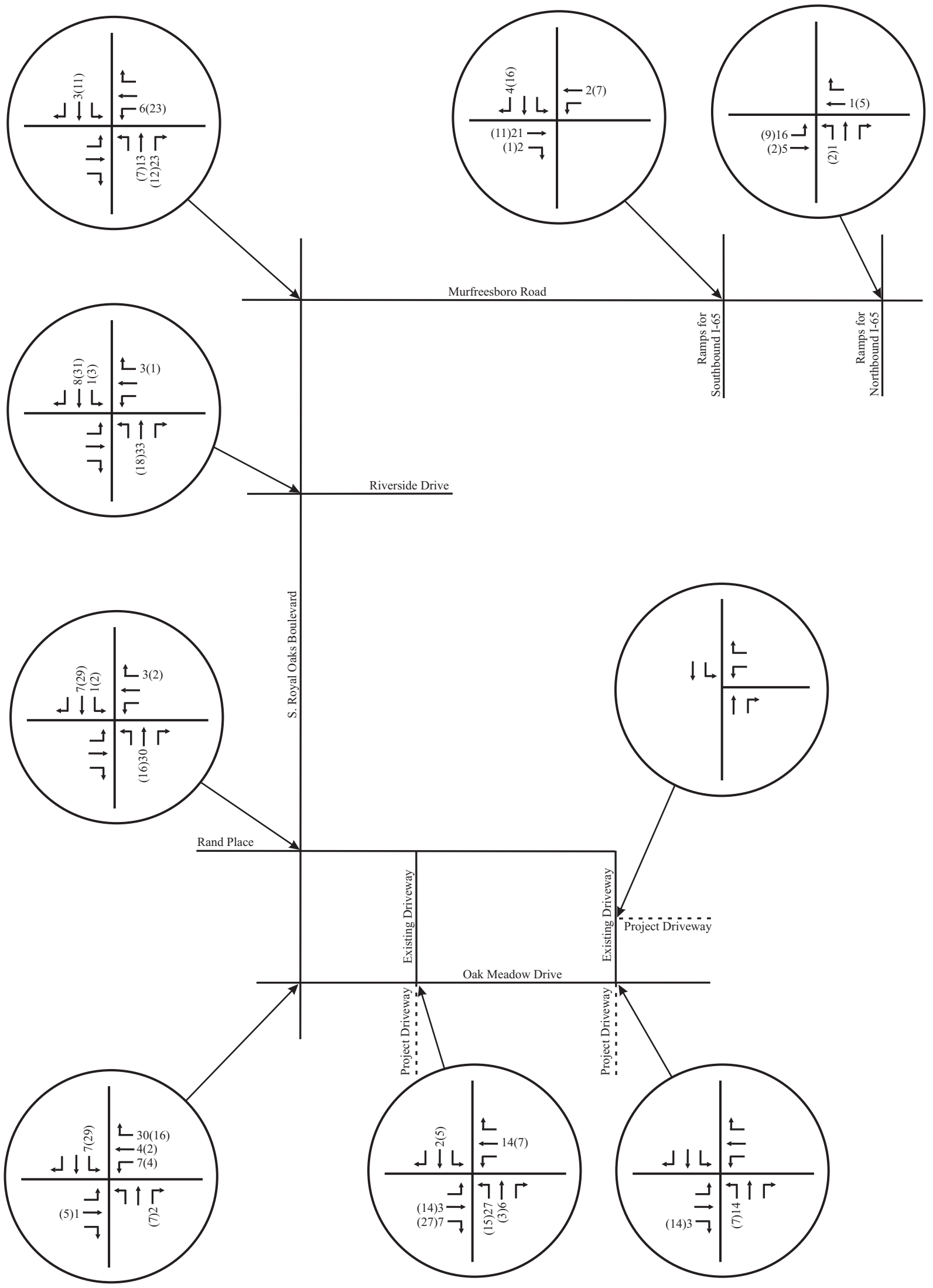


No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6B.
Directional Distribution of Peak Hour Traffic Volumes Generated by the Proposed Apartments (Northern Site)

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning

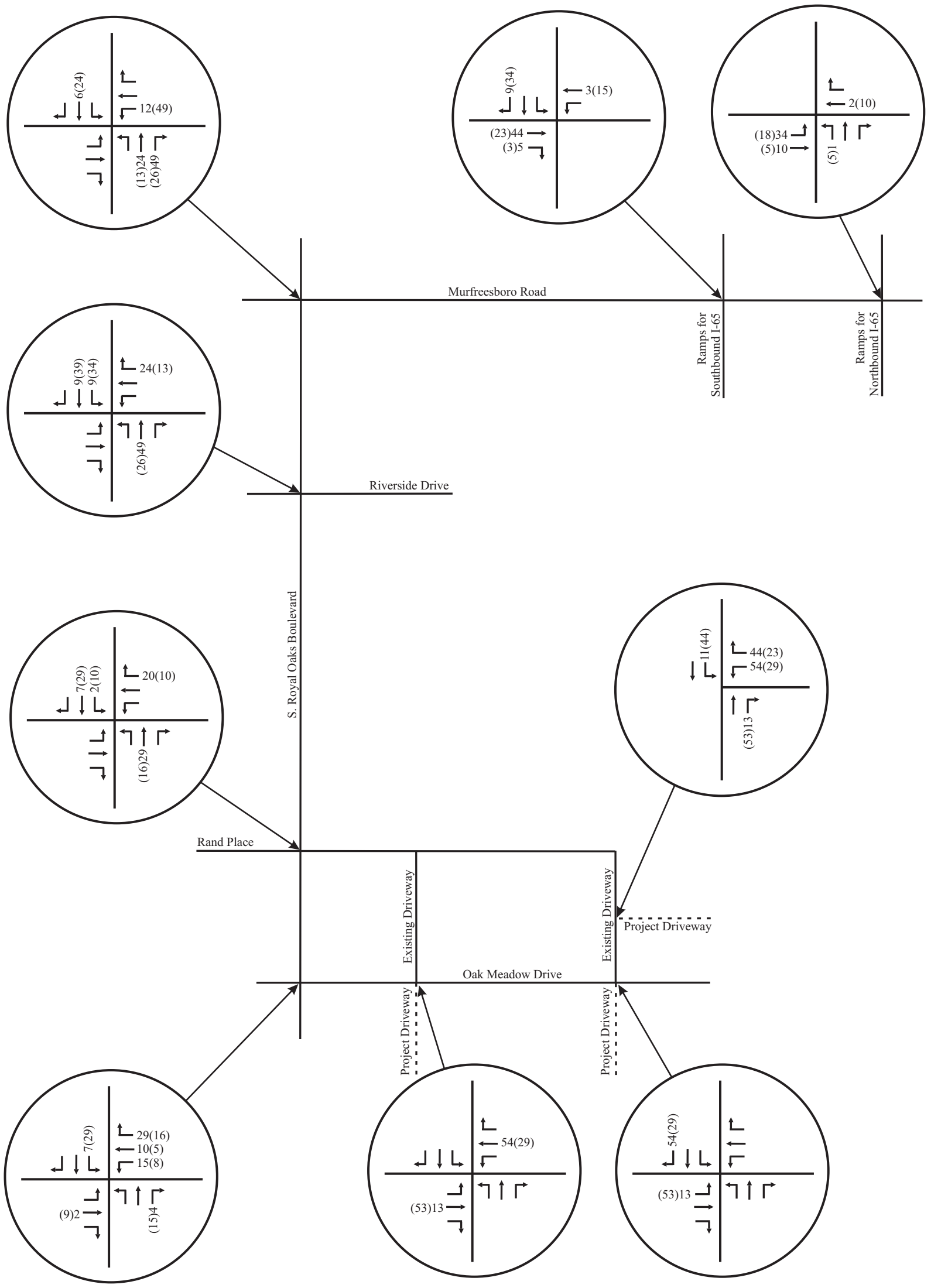


No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7A.
Peak Hour Traffic Volumes
Generated by the Proposed Apartments (Southern Site)

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning

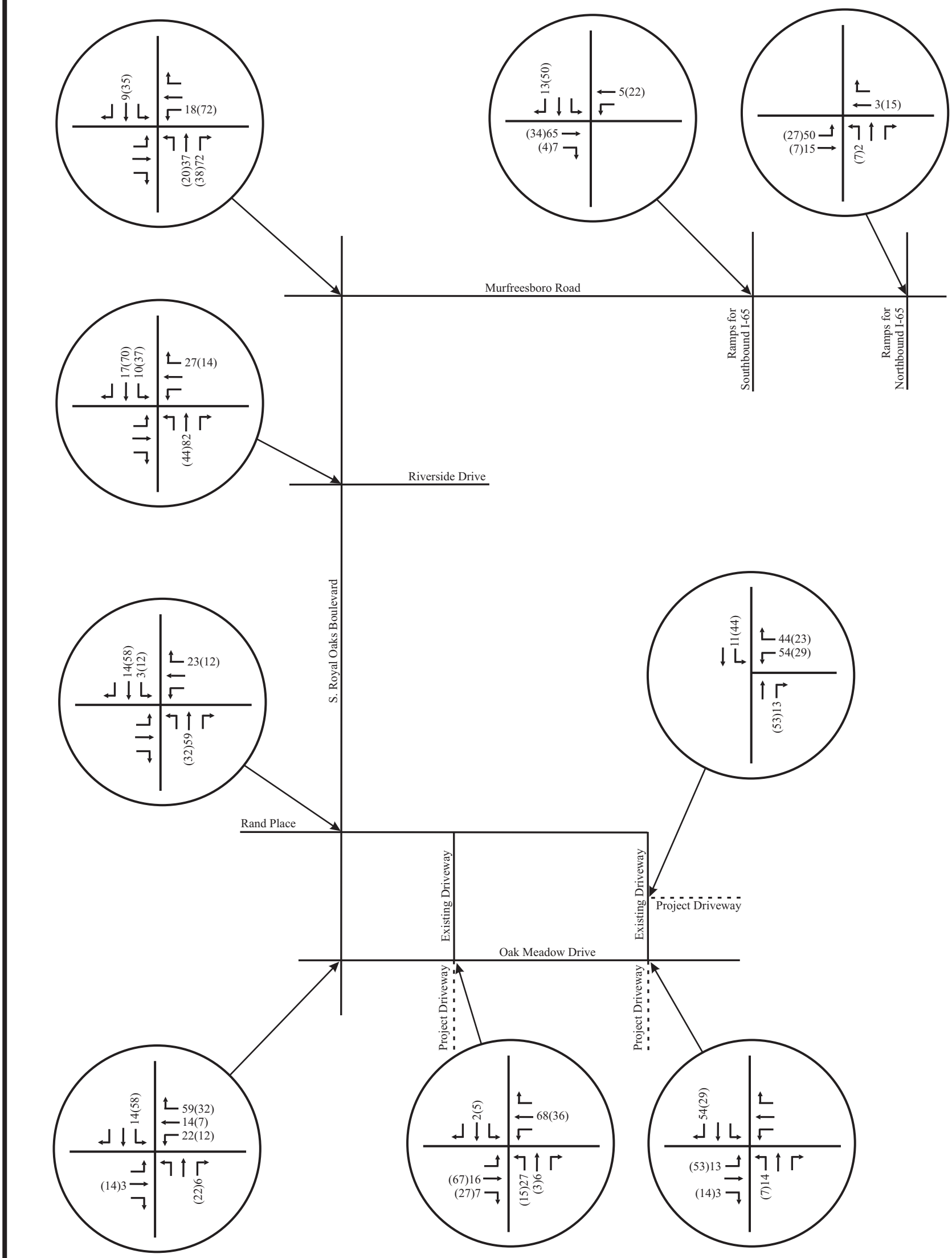


No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7B.
Peak Hour Traffic Volumes
Generated by the Proposed Apartments (Northern Site)

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning



No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7C.
Total Peak Hour Traffic Volumes
Generated by the Proposed Apartments (Total Both Sites)

5.3 CAPACITY ANALYSES

In order to identify the projected peak hour traffic volumes at the completion of the proposed project, the trips generated by the project were added to the background peak hour traffic volumes. The resulting peak hour volumes are shown in Figure 8.

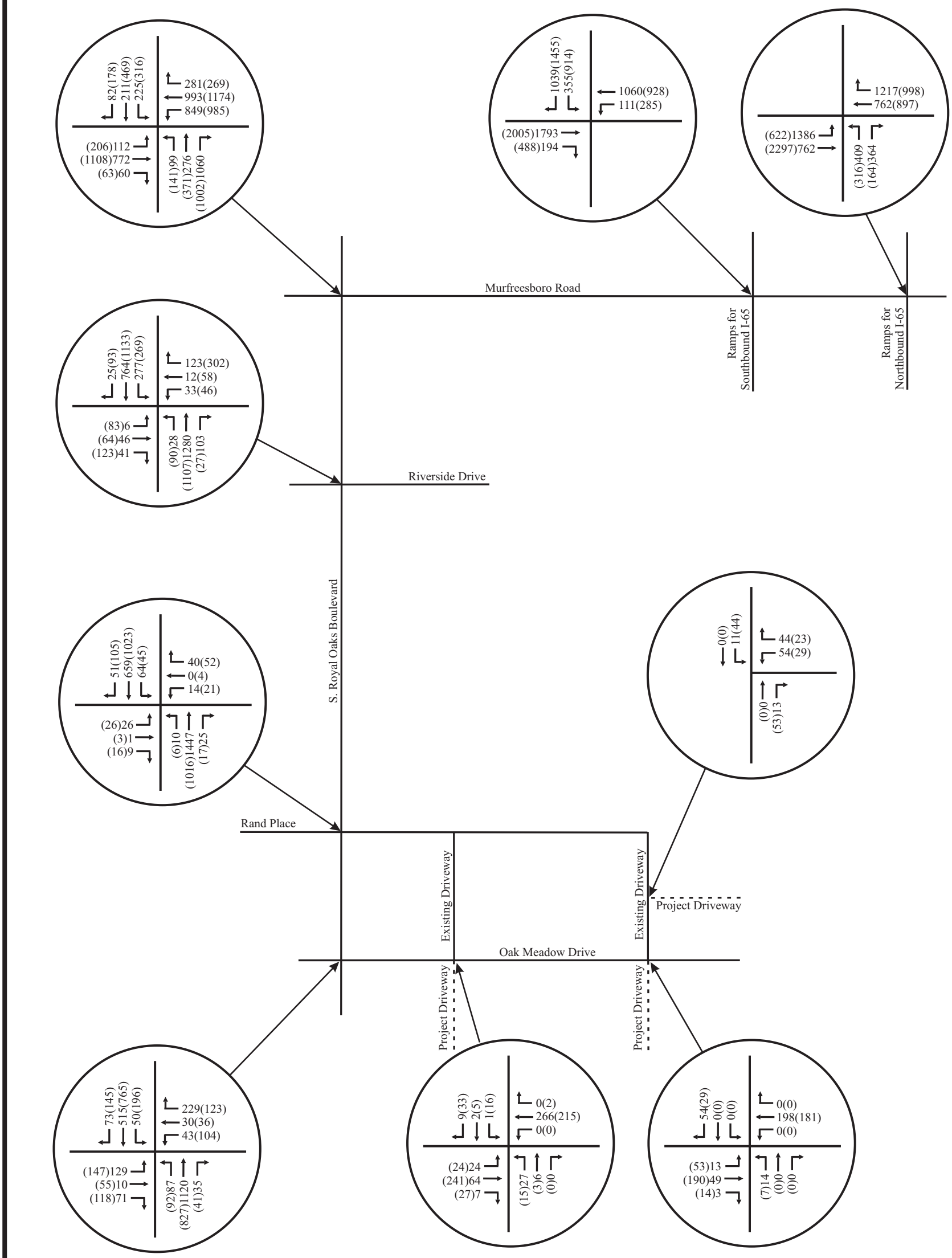
Using the total projected peak hour traffic volumes, capacity analyses were conducted in order to determine the impact of the project on the roadway system. Specifically, these capacity analyses were used to evaluate the need for roadway and traffic control improvements within the study area. For these analyses, the following assumptions were made:

- All existing laneage and traffic control will be maintained and no improvements will be provided.

- Each of the project accesses will be constructed to include one entering lane and one exiting lane.

The results of the capacity analyses for the total projected peak hour traffic volumes are shown in Table 7, and Appendix C includes the capacity analyses worksheets. These analyses indicate that the total projected conditions with full build-out of the project are consistent with the existing and background conditions within the study area.

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning



N

No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 8.
Total Projected Peak Hour Traffic Volumes at the Completion of the Proposed Apartments

TABLE 7. PROJECTED PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
Oak Meadow Drive and the Western Access for Home Depot / Apartments	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Westbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Northbound Left/Thru/Right Turns	LOS B	1 veh	LOS B	1 veh
	Southbound Left/Thru/Right Turns	LOS A	1 veh	LOS B	1 veh
Oak Meadow Drive and the Eastern Access for Home Depot / Apartments	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Westbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Northbound Left/Thru/Right Turns	LOS B	1 veh	LOS B	1 veh
	Southbound Left/Thru/Right Turns	LOS A	1 veh	LOS A	1 veh
Eastern Access for Home Depot / Access for Northern Apartments	Southbound Left Turns / Thrus	LOS A	1 veh	LOS A	1 veh
	Westbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	35 feet	LOS C	69 feet
	Northbound Thrus	LOS B	361 feet	LOS C	327 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	23 feet	LOS C	118 feet
	Southbound Thrus/Right Turns	LOS B	149 feet	LOS C	446 feet
	Eastbound Left Turns	LOS D	126 feet	LOS D	135 feet
	Eastbound Thrus/Right Turns	LOS B	17 feet	LOS D	107 feet
	Westbound Left Turns	LOS C	50 feet	LOS D	98 feet

	Westbound Thrus	LOS D	42 feet	LOS D	46 feet
	Westbound Right Turns	LOS C	161 feet	LOS A	40 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS E	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS C	1 veh
	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS C	1 veh	LOS C	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	10 feet	LOS C	58 feet
	Northbound Thrus	LOS B	525 feet	LOS D	776 feet
	Northbound Right Turns	LOS A	28 feet	LOS A	0 feet
	Southbound Left Turns	LOS F	233 feet	LOS E	165 feet
	Southbound Thrus/Right Turns	LOS A	339 feet	LOS B	562 feet
	Eastbound Left Turns	LOS E	17 feet	LOS F	215 feet
	Eastbound Thrus/Right Turns	LOS E	79 feet	LOS D	88 feet
	Westbound Left Turns	LOS E	61 feet	LOS F	70 veh
	Westbound Thrus/Right Turns	LOS C	21 feet	LOS D	305 veh
	Overall Intersection	**LOS F**		**LOS F**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	85 feet	LOS E	151 feet
	Eastbound Thrus / Right Turns	LOS D	335 feet	LOS D	475 feet

	Westbound Left Turns	LOS E	446 feet	LOS F	573 feet
	Westbound Thrus	LOS D	547 feet	LOS D	517 feet
	Westbound Right Turns	LOS A	123 feet	LOS B	125 feet
	Northbound Left Turns	LOS E	71 feet	LOS E	100 feet
	Northbound Thrus	LOS D	165 feet	LOS D	252 feet
	Northbound Right Turns	LOS D	680 feet	LOS D	717 feet
	Southbound Left Turns	LOS E	159 feet	LOS F	272 feet
	Southbound Thrus / Right Turns	LOS D	165 feet	LOS F	512 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	408 feet	LOS E	695 feet
	Eastbound Right Turns	LOS A	46 feet	LOS C	294 feet
	Westbound Left Turns	LOS E	162 feet	LOS F	521 feet
	Westbound Thrus	LOS B	296 feet	LOS C	433 feet
	Southbound Left Turns	LOS D	178 feet	LOS D	515 feet
	Southbound Right Turns	LOS F	754 feet	LOS F	1305 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	1083 feet	LOS E	343 feet
	Eastbound Thrus	LOS A	75 feet	LOS C	495 feet
	Westbound Thrus	LOS D	373 feet	LOS C	487 feet
	Westbound Right Turns	LOS C	573 feet	LOS B	330 feet
	Northbound Left Turns	LOS F	340 feet	LOS E	222 feet

	Northbound Right Turns	LOS E	353 feet	LOS D	190 feet
	Overall Intersection	**LOS F**		**LOS D**	

5.4 CAPACITY ANALYSES

The results of the capacity analyses for the existing, background, and total projected peak hour traffic volumes are included in Tables 8 and 9 for comparison purposes. Also, the levels of service that worsen from background conditions to total projected conditions with the proposed project are highlighted in red. Finally, additional analyses were conducted in order to identify how well the intersections within the study area would operate if a third northbound through lane were provided on S. Royal Oaks between Oak Meadow Drive and Murfreesboro Road. Specifically, for these analyses, the northbound right turn lanes at Oak Meadow Drive, Rand Place, and Riverside Drive were converted to shared through/right turn lanes. The results of these additional analyses are shown in Tables 8 and 9. These comparisons and analyses that reveal poor levels of service are described below:

S. Royal Oaks Boulevard and Rand Place / Access for Home Depot
At this intersection, the westbound left turns from the Home Depot access operate at LOS E during the AM peak hour during the existing, background, and total projected conditions. Also, the eastbound left turns from the Rand Place operate at LOS E during the PM peak hour under total projected conditions. These results are typical at unsignalized intersections on major arterial roadways. Also, this intersection is not an appropriate location for a traffic signal installation because of its proximity to the existing traffic signal at Oak Meadow Drive. Therefore, the existing and projected levels of service for motorists on the side streets are reasonable and appropriate, and mitigation is not necessary.

S. Royal Oaks Boulevard and Riverside Drive / Center Point Place
This intersection operates at LOS F under existing, background, and total projected conditions. Specifically, these results occur because the northbound right turn volume at Murfreesboro Road, north of Riverside Drive, is significantly high during both peak hours, and these vehicles queue south toward Riverside Drive.

It is important to note that the eastbound and westbound turning movements operate with a single phase, without protected left turn signal phases. Capacity and simulation software indicates that a single phase operates more efficiently than protected-plus-permitted phases for the side streets. However, field observations indicate that the single phase is confusing for eastbound and westbound motorists, resulting in unnecessary delays and potential for vehicle conflicts. If the existing traffic signal were modified to include protected-plus-permitted signal phases rather than a single signal phase, eastbound and westbound motorists would likely experience longer delays but safer conditions. If the total time dedicated to the protected-plus-permitted signal phases does not exceed the single signal phase currently provided, this change would have a negligible impact on the northbound and southbound vehicle delays and queues.

Murfreesboro Road and Royal Oaks Boulevard
This intersection operates poorly during the PM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound throughs, westbound throughs, westbound left turns, and northbound right turns are all approximately equal during

both peak hours. Although some of these turning movements can operate during the same signal phases, the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

Murfreesboro Road and the Ramps for Southbound I-65

This intersection operates poorly during the PM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound throughs, westbound throughs, and southbound right turns are all significantly high during both peak hours, and the traffic volume for the southbound left turns are significantly high during the PM peak hour. Although some of these turning movements can operate during the same signal phases, the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

Murfreesboro Road and the Ramps for Northbound I-65

This intersection operates poorly during the AM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound left turns and westbound right turns are significantly high during the AM peak hour, and the traffic volumes for the eastbound throughs and westbound right turns are significantly high during the PM peak hour. These turning movements cannot operate during the same signal phases, and the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

TABLE 8. COMPARISON OF AM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVELS OF SERVICE			
		EXISTING CONDITIONS	BACKGROUND CONDITIONS	TOTAL PROJECTED CONDITIONS	WITH THIRD NORTHBOUND TRAVEL LANE
S. Royal Oaks Boulevard and Oak Meadow Drive	Overall Intersection	LOS B (13.9 sec/veh)	LOS B (15.4 sec/veh)	LOS B (17.3 sec/veh)	LOS B (14.7 sec/veh)
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A (8.8 sec/veh)	LOS A (9.1 sec/veh)	LOS A (9.1 sec/veh)	LOS A (9.1 sec/veh)
	Southbound Left Turns	LOS B (12.6 sec/veh)	LOS B (13.8 sec/veh)	LOS B (14.5 sec/veh)	LOS B (14.5 sec/veh)
	Eastbound Left Turns	LOS D (0.4 sec/veh)	LOS D (31.0 sec/veh)	LOS D (34.8 sec/veh)	LOS D (30.0 sec/veh)
	Eastbound Thrus/Right Turns	LOS B (0.1 sec/veh)	LOS B (13.9 sec/veh)	LOS B (14.4 sec/veh)	LOS B (14.5 sec/veh)
	Westbound Left Turns	LOS E (0.3 sec/veh)	LOS E (43.1 sec/veh)	LOS E (47.0 sec/veh)	LOS E (47.8 sec/veh)
	Westbound Thrus/Right Turns	LOS B (0.1 sec/veh)	LOS C (15.0 sec/veh)	LOS C (16.3 sec/veh)	LOS C (16.5 sec/veh)
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place	Overall Intersection	LOS F (undefined)	LOS F (undefined)	LOS F (undefined)	LOS F (undefined)
Murfreesboro Road and Royal Oaks Boulevard	Overall Intersection	LOS D (43.8 sec/veh)	LOS D (46.3 sec/veh)	LOS D (45.7 sec/veh)	LOS D (44.8 sec/veh)
Murfreesboro Road and Ramps for Southbound I-65	Overall Intersection	LOS C (32.4 sec/veh)	LOS D (40.4 sec/veh)	LOS D (41.9 sec/veh)	LOS D (37.8 sec/veh)
Murfreesboro Road and Ramps for Northbound I-65	Overall Intersection	LOS E (64.7 sec/veh)	LOS F (81.2 sec/veh)	LOS F (88.7 sec/veh)	LOS E (75.7 sec/veh)

TABLE 9. COMPARISON OF PM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVELS OF SERVICE			
		EXISTING CONDITIONS	BACKGROUND CONDITIONS	TOTAL PROJECTED CONDITIONS	TOTAL PROJECTED CONDITIONS
S. Royal Oaks Boulevard and Oak Meadow Drive	Overall Intersection	LOS C (22.0 sec/veh)	LOS C (25.3 sec/veh)	LOS C (27.8 sec/veh)	LOS C (22.5 sec/veh)
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS B (10.3 sec/veh)	LOS B (10.7 sec/veh)	LOS B (11.0 sec/veh)	LOS B (11.0 sec/veh)
	Southbound Left Turns	LOS B (10.1 sec/veh)	LOS B (10.6 sec/veh)	LOS B (10.9 sec/veh)	LOS B (10.9 sec/veh)
	Eastbound Left Turns	LOS D (27.7 sec/veh)	**LOS D** (34.1 sec/veh)	**LOS E** (39.7 sec/veh)	LOS E (37.4 sec/veh)
	Eastbound Thrus/Right Turns	LOS B (14.7 sec/veh)	LOS C (15.7 sec/veh)	LOS C (16.6 sec/veh)	LOS C (16.7 sec/veh)
	Westbound Left Turns	LOS D (25.1 sec/veh)	LOS D (29.2 sec/veh)	LOS D (31.6 sec/veh)	LOS D (31.9 sec/veh)
	Westbound Thrus/Right Turns	LOS B (14.4 sec/veh)	**LOS B** (14.7 sec/veh)	**LOS C** (15.0 sec/veh)	LOS C (15.1 sec/veh)
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place	Overall Intersection	LOS F (undefined)	LOS F (undefined)	LOS F (undefined)	LOS F (undefined)
Murfreesboro Road and Royal Oaks Boulevard	Overall Intersection	LOS E (62.6 sec/veh)	**LOS E** (73.0 sec/veh)	**LOS F** (82.3 sec/veh)	LOS E (78.6 sec/veh)
Murfreesboro Road and Ramps for Southbound I-65	Overall Intersection	LOS E (78.6 sec/veh)	LOS F (97.6 sec/veh)	LOS F (104.8 sec/veh)	LOS F (98.6 sec/veh)
Murfreesboro Road and Ramps for Northbound I-65	Overall Intersection	LOS C (29.5 sec/veh)	**LOS C** (34.2 sec/veh)	**LOS D** (35.2 sec/veh)	LOS D (35.6 sec/veh)

6. CONCLUSIONS AND RECOMMENDATIONS

The analyses presented in this study indicate the following information for the intersections that provide direct access to the project sites:

Oak Meadow Drive and the Eastern Project Access / Home Depot Access
At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the northbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low.

Oak Meadow Drive and the Western Project Access / Home Depot Access
At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the northbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low.

Eastern Home Depot Access and the Project Access for the Northern Apartments
At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the westbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low.

S. Royal Oaks Boulevard and Oak Meadow Drive
The capacity analyses indicate that all of the turning movements at this intersection will operate at acceptable levels of service. Also, the existing lengths of the turn lanes are adequate to accommodate the total projected traffic volumes with the completion of the proposed project. Finally, it is important to note that the westbound approach of Oak Meadow Drive already includes separate left, through, and right turn lanes at the intersection with S. Royal Oaks Boulevard, and the existing traffic signal already includes a right turn overlap signal phase for westbound motorists. Therefore, there are no additional dedicated turn lanes or traffic control modifications that can be provided at this location. Field observations and traffic counts confirm that the northbound and southbound through volumes are significant, particularly the northbound through movement during the AM peak hour. However, the proposed project will have a minimal impact on these conditions.

S. Royal Oaks Boulevard and Rand Place / Access for Home Depot
The capacity analyses indicate that all of the critical turning movements at this unsignalized intersection will operate at acceptable levels of service. Also, the existing lengths of the turn lanes are adequate to accommodate the total projected traffic volumes with the completion of the proposed project. Field observations and traffic counts confirm that the northbound and southbound through volumes are significant, particularly the northbound through movement during the AM peak hour. Also, the field observations and traffic counts confirm that the eastbound and westbound left turn volumes are relatively low, presumably because left turns are challenging when the northbound and southbound through volumes are high. Also, the eastbound

and westbound motorists have access to the existing traffic signal at Oak Meadow Drive. It is important to note that proposed project will have a minimal impact on these conditions. Also, it is important to note that this intersection is not an appropriate location for a traffic signal installation because of its proximity to the existing traffic signal at Oak Meadow Drive.

S. Royal Oaks Boulevard and Riverside Drive / Center Point Place

The capacity analyses indicate that several turning movements at this intersection will operate at poor levels of service under existing, background, and total projected conditions. In particular, the southbound left turns, eastbound turns, and westbound left turns are expected to operate at poor levels of service but with reasonable vehicle queues. The vehicle delays for these turning movements can only be reduced by increasing the delays for northbound and southbound through vehicles. Specifically, the traffic signal would have to allocate more "green time" to the southbound left turns by reducing the "green time" for northbound throughs. Also, the traffic signal would have to allocate more "green time" to the eastbound and westbound turning movements by reducing the "green time" for northbound and southbound throughs. Field observations and traffic counts confirm that the northbound and southbound through volumes are significant, particularly the northbound through movement during the AM peak hour. Therefore, it is recommended that the northbound and southbound through movements be prioritized during the peak hours in order to minimize overall delays within the study area.

APPENDIX A
TRAFFIC IMPACT STUDY SCOPE PROVIDED BY
THE CITY OF FRANKLIN AND NEEL-SCHAFFER, INC.

Exhibit B

City of Franklin
Engineering Department

APPLICATION FORM
REQUEST FOR APPROVED TRANSPORTATION IMPACT ANALYSIS REPORT

Applicant Name:	Crunk Engineering .	Applicant Name:	Epoch Residential .
Address:	1894 Gen. George Patton.	Address:	359 Carolina Avenue .
	Franklin, TN 37067 .		Winter Park, FL 32789 .
Phone #:	(615) 873-1795 .	Phone #:	(321) 316-6005 .
e-mail address:	adam@crunkeng.com .	e-mail address:	mccarley@epochresidential.com .

PROCESS OVERVIEW

A Transportation Impact Analysis shall be prepared by the Applicant's Consultant or the City's Traffic Consultant using the standard format specified by the Institute of Transportation Engineers in accordance with the following:

(i) The applicant shall submit a completed *Request for Transportation Impact Analysis Application Form* to the Engineering Department.

(ii) Scope of Services
   a. Following initial review of the application form, the Engineering Department shall prepare and submit a Scope of Services and schedule to the Applicant. If necessary a meeting will be scheduled to review and discuss the Scope of Services in detail.
   b. Following approval the applicant will pay the City 90% of the estimated cost of the traffic impact study. At the completion of the study the City shall reimburse the applicant all remaining fees.

(iii) Transportation impact analyses shall be prepared utilizing traffic data that are consistent with:
   a. The land use and density data as referenced in the most current edition of Trip Generation, published by the Institute of Transportation Engineers;
   b. Current city and state traffic counts for surrounding streets;
   c. Any additional traffic counts performed as a part of preparing the study.

Attachment A

City of Franklin Review Process for Transportation Impact Analysis

Step 1 – Preliminary discussion with Consultant/Developer on project description including site plan.
Step 2 – Scoping of Transportation Impact Analysis between the City of Franklin and Consultant/Developer.
Step 3 – Consultant, Traffic Engineer and Director of Engineering execute a MOU (Fees may apply per COF Ordinance 2015-64.
Step 4 – Consultant/Developer pays review fee and submits Transportation Impact Analysis.
Step 5 – City of Franklin prepares initial comments on the transportation impact analysis, if necessary.

Step 6 – Consultant submits corrections/revisions to the transportation impact analysis, if necessary.
Step 7 – City of Franklin prepares initial comments on proposed mitigation measures, if necessary
Step 8 – Consultant submits corrections/revisions on proposed mitigation measures, if necessary and electronic copy of the transportation impact analysis.
Step 9 – City of Franklin issues an assessment letter

Attachment B

Transportation Impact Analysis – Memorandum of Understanding (MOU)

This MOU acknowledges that the transportation impact analysis for the following project will be prepared in accordance with the latest version of City of Franklin Zoning Ordinance.

Project Name: Epoch Franklin .
Project Address: Oak Meadow Drive, east of S. Royal Oaks Boulevard .
Project Description: 352 apartments (240 units on north side, 112 apts on the south side) .

Attach a site map and a trip generation table with a description of the proposed land uses, ITE rates, estimated daily, morning, midday and afternoon peak hour volumes (ins/outs/totals), proposed trip credits, etc.

Project Buildout Year: 2018 Ambient or CMP Growth Rate: : 4 % Per Yr.

Study Intersections:

1. Oak Meadow Drive and Private Road for Home Depot / western project access	9. Oak Meadow Drive and the eastern project accesses
2. S. Royal Oaks Blvd and Oak Meadow Dr	10.
3. S. Royal Oaks Blvd and Center Point Pl / Riverside Dr	11.
4. Highway 96E and Royal Oaks Blvd (for data collection and signal timing purposes only)	12.
5. Highway 96E and Ramps for SB I-65(for data collection and signal timing purposes only)	13.
6. Highway 96E and Ramps for NB I-65(for data collection and signal timing purposes only)	14.

Trip Credits: (Exact amount of credit subject to approval by City of Franklin)

	Yes	No
Transit Usage		X
Existing Active Land Use		X
Previous Land Use		X
Internal Trip		X
Pass-By Trip		X

Exhibit B

Consultant:	FTG, LLC	Developer:	Epoch Residential
Address:	PO Box 682736	Address:	359 Carolina Avenue
	Franklin, TN 37068		Winter Park, FL 32789
Phone #:	(615) 771-8022	Phone #:	(321) 316-6005
e-mail address:	Gillian@FTGtraffic.com	e-mail address:	mccarley@epochresidential.com

Approved By: _____ _____

City of Franklin Traffic Engineer Director of Engineering

Reason for Request: (Planned Unit Development, Site Plan, Rezoning)

site plan

Description of Proposed Project (Address, Map/Parcel Number, etc.) (Attach a conceptual development plans showing all access points and adjacent streets.):

079 08800 00009079

079 10105 00109079

Existing Land Use (be specific):

undeveloped

Proposed Land Use (be specific):

240 apartments on 13.06 acres (north) and 112 apartments on 18.87 acres (south)

Potential Development Yield (number of residential units; building square footage, projected number of employees, hours of operations):

352 apartments

As applicant, I agree to pay to the City of Franklin 90% of the entire cost of the Transportation Impact Analysis.

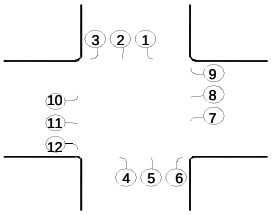
Property Owner Signature: _____

Property Owner Title: _____

Date: _____

The information above shall be submitted to the Engineering Department (109 3rd Ave South; Franklin, TN 37064) to review and provide estimated cost along with a proposed scope of services. All questions should be directed to Carl Baughman, Traffic Engineer III (615-791-3218).

APPENDIX B
EXISTING TRAFFIC COUNTS

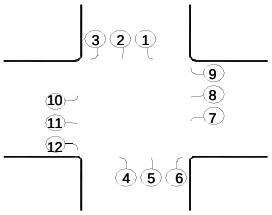


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Oak Meadow Dr and Eastern Home Depot Access
DATE: 23-Feb-16 Tue
RECORDER: FTG
NOTES: unsignalized

LOCATION	S/B Home Depot Access			N/B			W/B Oak Meadow Dr			E/B Oak Meadow Dr				
TIME	1	2	3	4	5	6	7	8	9	10	11	12		
6:30-6:45								24			7		209	31
6:45-7:00								**54**			**13**		**228**	**67**
7:00-7:15								**50**			**13**		209	63
7:15-7:30								**36**			**12**		189	48
7:30-7:45								**43**			**7**		179	50
7:45-8:00								41			7			48
8:00-8:15								33			10			43
8:15-8:30								29			9			38
4:30-4:45								**46**			**33**		**344**	79
4:45-5:00								**33**			**49**		336	82
5:00-5:15								**41**			**48**		346	89
5:15-5:30								**48**			**46**		329	**94**
5:30-5:45								33			38		309	71
5:45-6:00								34			58			92
6:00-6:15								25			47			72
6:15-6:30								32			42			74
TOTAL								**602**			**439**			
AM PK HR								183			45		**6:45-7:45**	
PM PK HR								168			176		**4:30-5:30**	

AM PK PHF								0.85			0.87		**0.85**
PM PK PHF								0.88			0.90		**0.91**

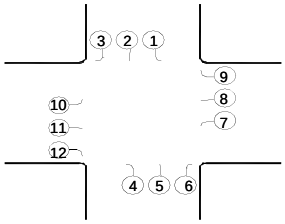


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Oak Meadow Dr and Western Home Depot Access
DATE: 23-Feb-16 Tue
RECORDER: FTG
NOTES: unsignalized

LOCATION	S/B Home Depot Access			N/B			W/B Oak Meadow Dr			E/B Oak Meadow Dr				
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**		
6:30-6:45			1					24			7		213	32
6:45-7:00								**54**			**13**		**231**	**67**
7:00-7:15								**50**		**1**	**13**		213	64
7:15-7:30			**1**					**36**		**1**	**12**		192	50
7:30-7:45	**1**							**43**			**6**		180	50
7:45-8:00								41		1	7			49
8:00-8:15	1							33			9			43
8:15-8:30								29			9			38
4:30-4:45	**3**							**46**		**1**	**30**		**351**	80
4:45-5:00	**4**							**33**		**1**	**45**		343	83
5:00-5:15	**3**		**1**					**40**	**1**	**2**	**45**		354	92
5:15-5:30	**5**		**1**					**47**	**1**	**1**	**41**		335	**96**
5:30-5:45	3							33		1	35		314	72
5:45-6:00	6							34		2	52			94
6:00-6:15	7							25		1	40			73
6:15-6:30	5							32		1	37			75
TOTAL	**38**		**4**					**600**	**2**	**13**	**401**			
AM PK HR	1		1					183		2	44		**6:45-7:45**	
PM PK HR	15		2					166	2	5	161		**4:30-5:30**	

AM PK PHF	0.25		0.25					0.85		0.50	0.85		**0.86**
PM PK PHF	0.75		0.50					0.88	0.50	0.63	0.89		**0.91**

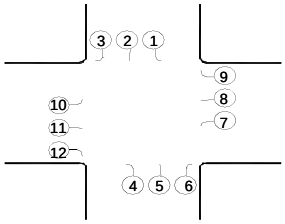


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Oak Meadow Dr
DATE: 4-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Oak Meadow Dr			E/B Oak Meadow Dr			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45	1	96	15	17	231	2	2	2	21	28	4	9	1,978
6:45-7:00	**4**	**88**	**17**	**17**	**270**	**7**	**1**	**4**	**49**	**31**	**2**	**12**	**2,078**
7:00-7:15	**6**	**115**	**15**	**14**	**300**	**6**	**5**	**2**	**43**	**26**	**2**	**16**	2,071
7:15-7:30	**9**	**117**	**15**	**23**	**242**	**4**	**4**		**33**	**34**		**17**	1,995
7:30-7:45	**3**	**157**	**21**	**27**	**225**	**3**	**7**	**8**	**28**	**28**		**21**	1,972
7:45-8:00	5	172	15	17	199	2	8	4	29	30	1	13	
8:00-8:15	3	123	22	22	214	4	8	8	17	29	2	22	
8:15-8:30	6	142	19	18	213	3	7	3	19	24		21	
4:30-4:45	**25**	**187**	**40**	**17**	**169**		**20**	**9**	**17**	**44**	**6**	**26**	**2,272**
4:45-5:00	**29**	**179**	**29**	**18**	**200**	**6**	**17**	**2**	**14**	**25**	**11**	**31**	2,225
5:00-5:15	**32**	**170**	**33**	**28**	**222**	**5**	**19**	**5**	**17**	**35**	**10**	**29**	2,170
5:15-5:30	**32**	**172**	**32**	**22**	**175**	**2**	**21**	**6**	**21**	**32**	**8**	**23**	2,016
5:30-5:45	27	150	29	16	188	4	14	3	16	33	5	28	1,932
5:45-6:00	33	158	33	8	162	11	12	7	15	35	10	22	
6:00-6:15	34	164	16	20	138	3	10	9	6	22	4	25	
6:15-6:30	33	175	18	9	148	1	17	6	9	23	4	19	
TOTAL	**282**	**2,365**	**369**	**293**	**3,296**	**63**	**172**	**78**	**354**	**479**	**69**	**334**	
AM PK HR	22	477	68	81	1,037	20	17	14	153	119	4	66	**6:45-7:45**
PM PK HR	118	708	134	85	766	13	77	22	69	136	35	109	**4:30-5:30**

AM PK PHF	0.61	0.76	0.81	0.75	0.86	0.71	0.61	0.44	0.78	0.88	0.50	0.79	**0.94**
PM PK PHF	0.92	0.95	0.84	0.76	0.86	0.54	0.92	0.61	0.82	0.77	0.80	0.88	**0.94**

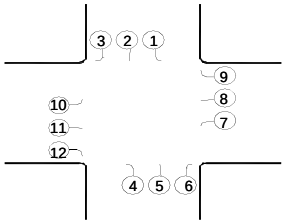


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Rand Place / Home Depot
DATE: 23-Feb-16 Tue
RECORDER: Burns
NOTES: unsignalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Home Depot Access			E/B Rand Place			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:30-6:45	13	93	10	3	279	11	2	1	2	6	1		1,934
6:45-7:00	**10**	**132**	**8**	**2**	**358**	**6**	**2**		**1**	**5**		**1**	**2,048**
7:00-7:15	**15**	**119**	**12**		**364**	**5**	**1**		**1**	**8**	**1**	**1**	2,029
7:15-7:30	**9**	**153**	**9**	**4**	**264**	**5**	**2**		**7**	**4**		**4**	1,968
7:30-7:45	**11**	**182**	**18**	**3**	**295**	**7**	**8**		**2**	**7**		**2**	1,986
7:45-8:00	6	188	6	4	279	9	3		5	2		4	
8:00-8:15	13	172	14	4	240	6	2	1	3	5		6	
8:15-8:30	11	123	11	7	307	7	2		4	7			
4:30-4:45	**5**	**207**	**19**	**1**	**218**	**5**	**11**		**6**	**8**	**1**	**4**	**2,005**
4:45-5:00	**5**	**211**	**27**	**1**	**209**	**3**	**3**		**8**	**6**	**1**	**6**	1,987
5:00-5:15	**5**	**228**	**26**	**2**	**235**	**4**	**4**	**3**	**3**	**5**		**2**	1,967
5:15-5:30	**5**	**237**	**25**	**2**	**234**	**4**	**1**	**1**	**5**	**5**	**1**	**3**	1,888
5:30-5:45	2	262	17	4	156	1	5	1	3	12		4	1,720
5:45-6:00	3	211	23	4	196	2	3	1	4	7		6	
6:00-6:15	3	213	18	2	168	3	5	1	4	12	2	7	
6:15-6:30	1	204	17	2	115	3	2			8		3	
TOTAL	**117**	**2,935**	**260**	**45**	**3,917**	**81**	**56**	**9**	**58**	**107**	**7**	**53**	
AM PK HR	45	586	47	9	1,281	23	13		11	24	1	8	**6:45-7:45**
PM PK HR	20	883	97	6	896	16	19	4	22	24	3	15	**4:30-5:30**

AM PK PHF	0.75	0.80	0.65	0.56	0.88	0.82	0.41		0.39	0.75	0.25	0.50	**0.97**
PM PK PHF	1.00	0.93	0.90	0.75	0.95	0.80	0.43	0.33	0.69	0.75	0.75	0.63	**0.96**

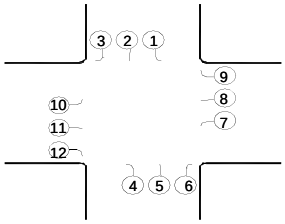


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Center Point Pl and Riverside Dr
DATE: 4-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Riverside Dr			E/B Cener Point Pl			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:30-6:45	50	105	4	3	226	24	6	2	13	0	3	6	2,202
6:45-7:00	45	113	5	2	335	22	5	0	23	2	9	3	2,321
7:00-7:15	**63**	**130**	**4**	**3**	**306**	**22**	**4**	**4**	**26**	**0**	**7**	**10**	**2,378**
7:15-7:30	**59**	**161**	**8**	**7**	**297**	**30**	**10**	**4**	**20**	**0**	**14**	**7**	2,372
7:30-7:45	**63**	**158**	**4**	**8**	**253**	**16**	**12**	**2**	**21**	**3**	**12**	**9**	2,375
7:45-8:00	**62**	**220**	**7**	**8**	**244**	**27**	**5**	**1**	**22**	**3**	**10**	**12**	
8:00-8:15	74	161	8	7	232	19	11	3	33	4	14	7	
8:15-8:30	70	194	6	7	231	25	13	5	31	10	10	18	
4:30-4:45	**56**	**255**	**24**	**19**	**240**	**6**	**11**	**15**	**59**	**21**	**14**	**38**	**2,942**
4:45-5:00	**48**	**243**	**16**	**30**	**228**	**4**	**13**	**14**	**67**	**15**	**15**	**29**	2,865
5:00-5:15	**47**	**233**	**28**	**12**	**247**	**7**	**11**	**20**	**71**	**28**	**13**	**30**	2,829
5:15-5:30	**64**	**233**	**18**	**22**	**240**	**8**	**8**	**5**	**70**	**13**	**17**	**17**	2,730
5:30-5:45	60	223	25	14	221	9	8	8	47	15	29	22	2,571
5:45-6:00	55	206	23	20	228	13	6	7	52	25	22	29	
6:00-6:15	61	200	19	19	199	6	7	10	63	25	14	25	
6:15-6:30	37	184	21	17	166	6	11	10	33	25	17	29	
TOTAL	**914**	**3,019**	**220**	**198**	**3,893**	**244**	**141**	**110**	**651**	**189**	**220**	**291**	
AM PK HR	247	669	23	26	1,100	95	31	11	89	6	43	38	**7:00-8:00**
PM PK HR	215	964	86	83	955	25	43	54	267	77	59	114	**4:30-5:30**

AM PK PHF	0.98	0.76	0.72	0.81	0.90	0.79	0.65	0.69	0.86	0.50	0.77	0.79	**0.96**
PM PK PHF	0.84	0.95	0.77	0.69	0.97	0.78	0.83	0.68	0.94	0.69	0.87	0.75	**0.97**

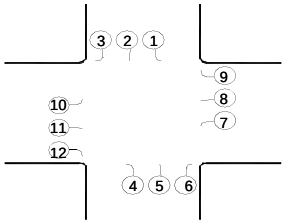


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Murfreesboro Road and Royal Oaks Blvd
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B N. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:30-6:45	21	26	8	14	38	211	99	137	37	4	118	7	3,669
6:45-7:00	29	17	4	24	80	244	123	193	43	15	168	8	4,005
7:00-7:15	48	27	5	28	119	253	107	159	37	20	166	13	4,252
7:15-7:30	51	25	14	22	53	236	160	204	57	21	163	13	4,384
7:30-7:45	**53**	**39**	**18**	**25**	**70**	**213**	**162**	**210**	**58**	**29**	**165**	**14**	**4,492**
7:45-8:00	**50**	**43**	**20**	**26**	**56**	**267**	**210**	**234**	**72**	**25**	**181**	**11**	
8:00-8:15	**53**	**36**	**19**	**14**	**48**	**205**	**193**	**249**	**61**	**23**	**202**	**11**	
8:15-8:30	**52**	**61**	**19**	**27**	**44**	**224**	**191**	**226**	**69**	**27**	**167**	**20**	
4:30-4:45	**71**	**94**	**37**	**28**	**90**	**220**	**195**	**284**	**54**	**45**	**238**	**15**	**5,614**
4:45-5:00	**67**	**103**	**47**	**32**	**78**	**213**	**198**	**252**	**61**	**50**	**275**	**17**	5,552
5:00-5:15	**78**	**90**	**39**	**38**	**74**	**235**	**222**	**272**	**60**	**41**	**267**	**12**	5,358
5:15-5:30	**77**	**107**	**42**	**33**	**73**	**205**	**217**	**279**	**74**	**55**	**246**	**14**	5,160
5:30-5:45	81	101	41	22	74	187	199	271	60	42	211	20	4,965
5:45-6:00	68	78	47	25	72	157	175	208	119	33	197	20	
6:00-6:15	80	89	44	32	65	169	169	234	60	42	229	17	
6:15-6:30	72	87	38	19	54	175	183	260	58	49	219	13	
TOTAL	**951**	**1,023**	**442**	**409**	**1,088**	**3,414**	**2,803**	**3,672**	**980**	**521**	**3,212**	**225**	
AM PK HR	208	179	76	92	218	909	756	919	260	104	715	56	**7:30-8:30**
PM PK HR	293	394	165	131	315	873	832	1,087	249	191	1,026	58	**4:30-5:30**

AM PK PHF	0.98	0.73	0.95	0.85	0.78	0.85	0.90	0.92	0.90	0.90	0.88	0.70	**0.94**
PM PK PHF	0.94	0.92	0.88	0.86	0.88	0.93	0.94	0.96	0.84	0.87	0.93	0.85	**0.98**

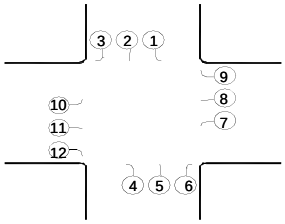


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Murfreesboro Road and the Ramps for Southbound I-65
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B Ramps			N/B			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45	63		148				11				369	34	2,929
6:45-7:00	69		181				31				406	47	3,112
7:00-7:15	66		139				30				471	49	3,159
7:15-7:30	**73**		**196**				**37**				**452**	**57**	**3,168**
7:30-7:45	**61**		**237**				**32**				**432**	**46**	3,140
7:45-8:00	**91**		**245**				**18**				**385**	**42**	
8:00-8:15	**86**		**219**				**29**				**385**	**45**	
8:15-8:30	91		240				24				393	39	
4:30-4:45	**205**		**299**				**71**				**480**	**114**	**4,656**
4:45-5:00	**222**		**322**				**48**				**388**	**95**	4,524
5:00-5:15	**197**		**298**				**76**				**470**	**119**	4,499
5:15-5:30	**222**		**374**				**69**				**469**	**118**	4,376
5:30-5:45	175		319				56				385	102	4,089
5:45-6:00	181		349				44				383	93	
6:00-6:15	196		290				43				408	100	
6:15-6:30	178		256				40				414	77	
TOTAL	**2,176**		**4,112**				**659**				**6,690**	**1,177**	
AM PK HR	311		897				116				1,654	190	**7:15-8:15**
PM PK HR	846		1,293				264				1,807	446	**4:30-5:30**

AM PK PHF	0.85		0.92				0.91				0.96	1.03	**0.97**
PM PK PHF	0.95		0.86				0.87				0.94	0.94	**0.93**



INTERSECTION TRAFFIC VOLUME COUNTS

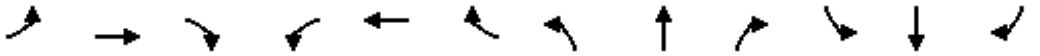
LOCATION: Murfreesboro Road and the Ramps for Northbound I-65
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B Ramps			N/B			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45				74		78		144	286	278			3,695
6:45-7:00				**109**		**94**		**150**	**306**	**319**			**3,772**
7:00-7:15				**65**		**66**		**183**	**306**	**331**			3,689
7:15-7:30				**94**		**92**		**154**	**267**	**299**			3,592
7:30-7:45				**107**		**85**		**213**	**248**	**284**			3,508
7:45-8:00				72		101		243	236	243			
8:00-8:15				108		82		182	223	259			
8:15-8:30				91		67		234	223	207			
4:30-4:45				**80**		**40**		**229**	**138**	**215**			**2,712**
4:45-5:00				**75**		**39**		**231**	**134**	**187**			2,597
5:00-5:15				**63**		**39**		**251**	**123**	**208**			2,490
5:15-5:30				**66**		**34**		**213**	**143**	**204**			2,376
5:30-5:45				49		40		200	105	193			2,230
5:45-6:00				79		46		161	101	172			
6:00-6:15				71		44		183	106	166			
6:15-6:30				52		44		176	89	153			
TOTAL				**1,255**		**991**		**1,503**	**3,034**	**3,718**			
AM PK HR				375		337		700	1,127	1,233			**6:45-7:45**
PM PK HR				284		152		814	924	538			**4:30-5:30**

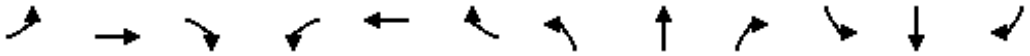
AM PK PHF				0.86		0.90		0.82	0.92	0.93	#DIV/0!		**0.96**
PM PK PHF				0.89		0.95		0.95	0.92	0.94	#DIV/0!		**0.97**

APPENDIX C
CAPACITY ANALYSES

EXISTING CONDITIONS



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	715	56	756	919	260	92	218	909	208	179	76
Future Volume (vph)	104	715	56	756	919	260	92	218	909	208	179	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3232	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3232	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				201					36	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		350			691			792			964	
Travel Time (s)		6.0			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	130	794	70	813	1010	295	112	273	977	226	242	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	864	0	813	1010	295	112	273	977	226	336	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

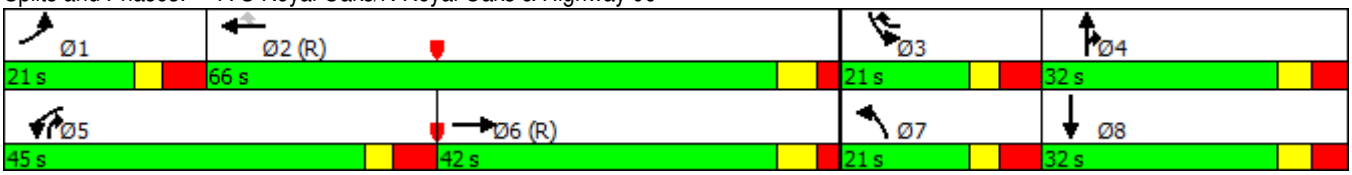


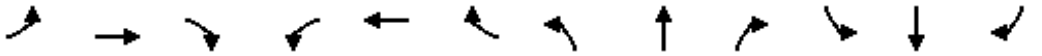
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.2	38.9		39.8	65.4	84.3	12.0	27.5	71.8	14.9	30.3	
Actuated g/C Ratio	0.09	0.28		0.28	0.47	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.40	0.66		0.87	0.63	0.28	0.39	0.38	0.67	0.64	0.46	
Control Delay	63.0	47.3		49.2	40.8	6.0	54.6	44.0	40.9	68.9	45.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.0	47.3		49.2	40.8	6.0	54.6	44.0	40.9	68.9	45.0	
LOS	E	D		D	D	A	D	D	D	E	D	
Approach Delay		49.3			39.2			42.6			54.6	
Approach LOS		D			D			D			D	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	12.9	24.5		13.5	25.1	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.0	35.5		37.5	61.0	13.5	11.2	24.5		13.5	26.8	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	10.8	35.5		37.5	62.2	13.5	10.0	24.5		13.5	28.0	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.6	35.9		37.5	63.8	13.1	8.9	24.5		13.1	28.7	
30th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
10th %ile Green (s)	7.8	39.4		36.4	68.0	10.7	7.2	24.5		10.7	28.0	
10th %ile Term Code	Gap	Coord		Gap	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	95	661		657	884	60	85	189	779	196	196	
Fuel Used(gal)	3	16		20	24	3	2	4	17	6	5	
CO Emissions (g/hr)	176	1101		1407	1661	210	144	304	1222	389	373	
NOx Emissions (g/hr)	34	214		274	323	41	28	59	238	76	73	
VOC Emissions (g/hr)	41	255		326	385	49	33	70	283	90	86	
Dilemma Vehicles (#)	0	28		0	34	0	0	0	0	0	0	
Queue Length 50th (ft)	58	255		352	503	50	50	117	447	103	125	
Queue Length 95th (ft)	80	306		m412	m539	m80	68	142	598	148	141	
Internal Link Dist (ft)		270			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1308		938	1591	1061	370	714	1473	367	728	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.34	0.66		0.87	0.63	0.28	0.30	0.38	0.66	0.62	0.46	

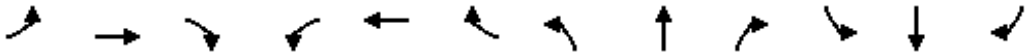
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 43.8		Intersection LOS: D	
Intersection Capacity Utilization 66.7%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 7: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1595	172	103	972	0	0	0	0	329	0	941
Future Volume (vph)	0	1595	172	103	972	0	0	0	0	329	0	941
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181									147
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1753	191	120	1117	0	0	0	0	387	0	1001
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1753	191	120	1117	0	0	0	0	387	0	1001
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



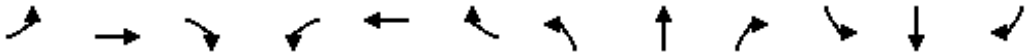
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.9	60.9	15.1	81.0					49.5		49.5
Actuated g/C Ratio		0.44	0.44	0.11	0.58					0.35		0.35
v/c Ratio		0.64	0.25	0.62	0.57					0.33		0.97
Control Delay		25.6	4.8	69.3	18.2					34.2		59.3
Queue Delay		0.1	0.0	0.0	0.3					1.2		0.0
Total Delay		25.7	4.8	69.3	18.5					35.3		59.3
LOS		C	A	E	B					D		E
Approach Delay		23.6			23.5							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		58.2	58.2	14.8	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		60.5	60.5	12.5	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.7	63.7	9.3	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		937	33	103	466					235		753
Fuel Used(gal)		30	2	3	12					6		21
CO Emissions (g/hr)		2126	132	199	828					397		1494
NOx Emissions (g/hr)		414	26	39	161					77		291
VOC Emissions (g/hr)		493	30	46	192					92		346
Dilemma Vehicles (#)		39	0	0	24					0		0
Queue Length 50th (ft)		282	24	116	273					132		451
Queue Length 95th (ft)		346	51	m156	m273					164		#617
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2759	758	229	1960					1162		1033
Starvation Cap Reductn		0	0	0	305					0		0
Spillback Cap Reductn		150	0	0	0					537		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.67	0.25	0.52	0.67					0.62		0.97

Intersection Summary

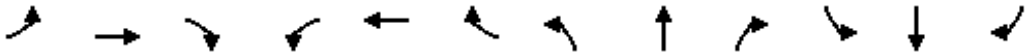
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 32.4		Intersection LOS: C	
Intersection Capacity Utilization 100.3%		ICU Level of Service G	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1233	691	0	0	700	1127	375	0	337	0	0	0
Future Volume (vph)	1233	691	0	0	700	1127	375	0	337	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			289			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1401	803	0	0	737	1150	395	0	366	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1401	803	0	0	737	1150	395	0	366	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.19	0.31			0.55	0.72	1.02		0.82			
Control Delay	144.4	2.7			35.6	24.7	109.7		29.7			
Queue Delay	0.3	0.1			0.0	0.0	0.0		0.0			
Total Delay	144.7	2.8			35.6	24.7	109.7		29.7			
LOS	F	A			D	C	F		C			
Approach Delay		93.0			28.9							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	895	79			533	785	332		80			
Fuel Used(gal)	50	4			19	27	12		4			
CO Emissions (g/hr)	3474	263			1333	1921	827		301			
NOx Emissions (g/hr)	676	51			259	374	161		59			
VOC Emissions (g/hr)	805	61			309	445	192		70			
Dilemma Vehicles (#)	0	18			25	0	0		0			
Queue Length 50th (ft)	~756	47			273	409	~195		66			
Queue Length 95th (ft)	#914	71			337	502	#302		#225			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		446			
Starvation Cap Reductn	67	590			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.26	0.40			0.55	0.72	1.02		0.82			

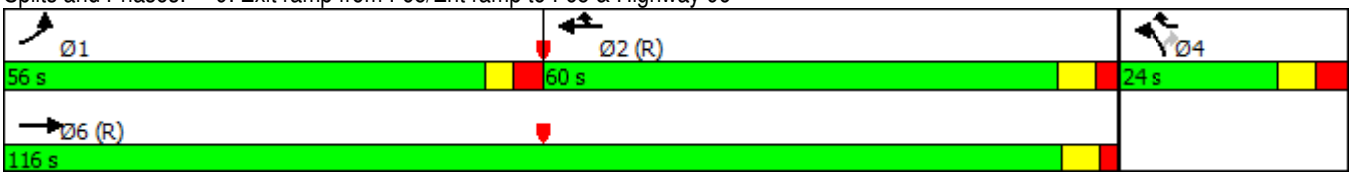
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.19			
Intersection Signal Delay: 64.7		Intersection LOS: E	
Intersection Capacity Utilization 100.3%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



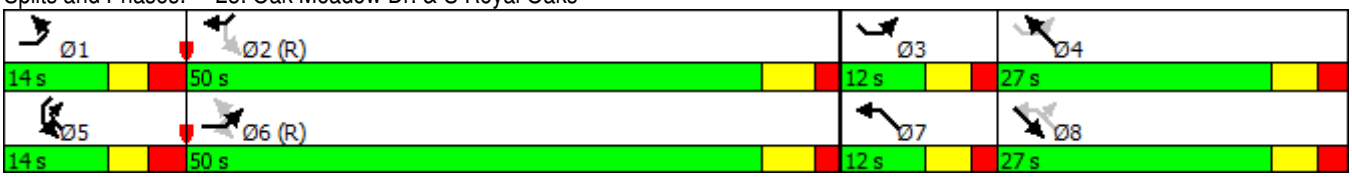
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	81	1037	20	119	4	66	17	14	153	22	477	68
Future Volume (vph)	81	1037	20	119	4	66	17	14	153	22	477	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.861				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1550	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.308	0.950		0.742			0.583			0.208		
Satd. Flow (perm)	497	3319	1531	1336	1550	0	1086	1925	1583	387	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		90				101		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		1875			721			918		1624		
Travel Time (s)		42.6			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	121	1103	32	151	7	90	23	24	166	29	636	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	1103	32	151	97	0	23	24	166	29	735	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	77.4	66.6	66.6	14.7	10.8		14.7	10.8	21.2	76.9	66.4	
Actuated g/C Ratio	0.75	0.65	0.65	0.14	0.10		0.14	0.10	0.21	0.75	0.64	
v/c Ratio	0.26	0.51	0.03	0.67	0.40		0.11	0.12	0.41	0.07	0.40	
Control Delay	5.3	12.0	0.1	54.1	15.7		34.1	42.2	16.9	4.5	8.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	5.3	12.0	0.1	54.1	15.7		34.1	42.2	16.9	4.5	8.6	
LOS	A	B	A	D	B		C	D	B	A	A	
Approach Delay		11.1			39.0			21.6		8.4		
Approach LOS		B			D			C		A		
90th %ile Green (s)	8.0	54.3	54.3	6.5	11.7		6.5	11.7	7.0	7.0	53.3	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.3	57.4	57.4	6.5	8.6		6.5	8.6	7.0	7.0	57.1	
70th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
50th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
50th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
30th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
30th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	72.0	72.0	6.5	0.0		0.0	0.0	7.0	7.0	72.0	
10th %ile Term Code	Min	Coord	Coord	Max	Skip		Skip	Skip	Min	Min	Coord	
Stops (vph)	21	538	0	110	17		15	14	53	7	205	
Fuel Used(gal)	1	21	0	2	1		0	0	2	0	9	
CO Emissions (g/hr)	97	1445	20	172	50		26	24	140	24	628	
NOx Emissions (g/hr)	19	281	4	33	10		5	5	27	5	122	
VOC Emissions (g/hr)	22	335	5	40	12		6	6	32	5	146	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	10	145	0	100	4		14	15	35	2	71	
Queue Length 95th (ft)	32	308	0	120	13		27	25	88	12	130	
Internal Link Dist (ft)		1795			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	482	2147	1044	224	423		214	439	420	433	1850	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.25	0.51	0.03	0.67	0.23		0.11	0.05	0.40	0.07	0.40	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 59.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 23: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	26	1100	95	6	43	38	31	11	89	247	669	23
Future Volume (vph)	26	1100	95	6	43	38	31	11	89	247	669	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	12	11	12	12	11	12
Grade (%)	1%					-1%	2%				-2%	
Storage Length (ft)		135			100		120	0			220	0
Storage Lanes		3			1		1	1			2	0
Taper Length (ft)					50		50				50	
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95
Frt		0.850	0.850					0.850			0.993	
Flt Protected				0.950	0.950		0.950			0.950	0.955	
Satd. Flow (prot)	1764	2707	1607	1754	1580	0	1787	1486	0	1787	3343	0
Flt Permitted	0.386			0.461	0.950		0.712			0.162	0.955	
Satd. Flow (perm)	681	2707	1607	851	1580	0	1339	1486	0	305	3343	0
Right Turn on Red			Yes						Yes			Yes
Satd. Flow (RTOR)			82					103			82	
Link Speed (mph)	30					30	30				30	
Link Distance (ft)	1624					433	515				792	
Travel Time (s)	36.9					9.8	11.7				18.0	
Peak Hour Factor	0.63	0.92	0.87	0.58	0.68	0.77	0.67	0.63	0.86	0.80	0.99	0.67
Heavy Vehicles (%)	0%	1%	0%	0%	11%	0%	0%	10%	3%	2%	2%	4%
Adj. Flow (vph)	41	1196	109	10	63	49	46	17	103	309	676	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	1196	109	10	63	49	46	120	0	309	710	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Left	Left	Right	Right	Left	Left	Right
Median Width(ft)	22					22	12				35	
Link Offset(ft)	0					0	0				0	
Crosswalk Width(ft)	16					16	16				16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	1.04	1.04	0.99	1.01	1.06	1.01	0.99	1.03	0.99
Turning Speed (mph)		9	9	15	15		15	9	9	15	15	9
Number of Detectors	1	1	0	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	42	50	42	42		42	226	
Trailing Detector (ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Position(ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Size(ft)	45	6	50	45	45	50	45	45		45	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	NA	custom	custom	custom	Prot	NA	D.Pm	Prot		pm+pt	Prot	
Protected Phases	1	6			4			8		5	2	
Permitted Phases	6		6	8			4			2		
Detector Phase	1	6		8	4		4	8		5	2	
Switch Phase												

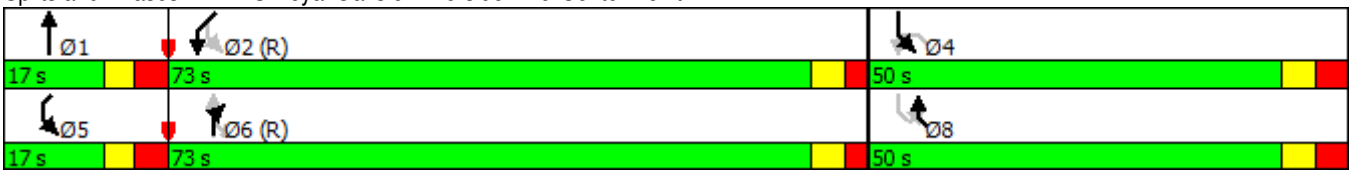
Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Minimum Initial (s)	5.0	10.0	10.0	7.0	7.0		7.0	7.0		5.0	10.0	
Minimum Split (s)	17.0	73.0	73.0	50.0	50.0		50.0	50.0		17.0	73.0	
Total Split (s)	17.0	73.0	73.0	50.0	50.0		50.0	50.0		17.0	73.0	
Total Split (%)	12.1%	52.1%	52.1%	35.7%	35.7%		35.7%	35.7%		12.1%	52.1%	
Maximum Green (s)	10.5	67.0	67.0	43.0	43.0		43.0	43.0		10.5	67.0	
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5		3.5	3.5		3.0	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	3.5		3.5	3.5		3.5	2.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-2.5	-2.5		-2.5	-2.5		-1.0	-3.0	
Total Lost Time (s)	5.5	3.0	3.0	4.5	4.5		4.5	4.5		5.5	3.0	
Lead/Lag	Lead	Lag	Lag							Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	None		None	None		None	C-Min	
Walk Time (s)		7.0	7.0	8.0	8.0		8.0	8.0			7.0	
Flash Dont Walk (s)		16.0	16.0	35.0	32.0		32.0	35.0			20.0	
Pedestrian Calls (#/hr)		0	0	0	0		0	0			0	
Act Effct Green (s)	106.6	101.5	101.5	14.0	14.0	0.0	14.0	14.0		114.6	107.9	
Actuated g/C Ratio	0.76	0.72	0.72	0.10	0.10	0.00	0.10	0.10		0.82	0.77	
v/c Ratio	0.07	0.61	0.09	0.12	0.40	no cap	0.35	0.50		0.83	0.27	
Control Delay	3.1	11.5	2.3	58.5	65.7		64.7	21.5		44.1	5.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.1	11.5	2.3	58.5	65.7	Error	64.7	21.5		44.1	5.6	
LOS	A	B	A	E	E	F	E	C		D	A	
Approach Delay	10.5					Err	33.4				17.3	
Approach LOS	B					F	C				B	
90th %ile Green (s)	7.4	93.9	93.9	16.1	16.1		16.1	16.1		10.5	97.0	
90th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
70th %ile Green (s)	6.8	96.7	96.7	13.3	13.3		13.3	13.3		10.5	100.4	
70th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
50th %ile Green (s)	6.5	98.6	98.6	11.4	11.4		11.4	11.4		10.5	102.6	
50th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
30th %ile Green (s)	6.3	100.4	100.4	9.6	9.6		9.6	9.6		10.5	104.6	
30th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
10th %ile Green (s)	0.0	103.0	103.0	7.0	7.0		7.0	7.0		10.5	120.0	
10th %ile Term Code	Skip	Coord	Coord	Min	Hold		Hold	Min		Max	Coord	
Stops (vph)	6	524	9	6	40	0	28	23		190	252	
Fuel Used(gal)	0	19	1	0	1	0	1	1		5	6	
CO Emissions (g/hr)	26	1357	91	9	66	9	48	67		335	451	
NOx Emissions (g/hr)	5	264	18	2	13	2	9	13		65	88	
VOC Emissions (g/hr)	6	314	21	2	15	2	11	16		78	105	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0		0	0	
Queue Length 50th (ft)	5	273	6	8	55	0	40	14		135	59	
Queue Length 95th (ft)	10	386	24	17	75	0	58	25		m#142	m246	
Internal Link Dist (ft)	1544					353	435				712	
Turn Bay Length (ft)		135	135	100	100		120			220	220	
Base Capacity (vph)	626	1962	1187	276	513	1	435	552		371	2595	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	

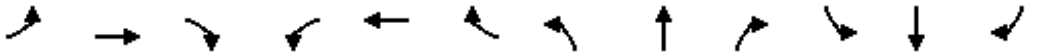
Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Reduced v/c Ratio	0.07	0.61	0.09	0.04	0.12	49.00	0.11	0.22		0.83	0.27	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SWL and 6:NBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: Err			
Intersection Signal Delay: Err		Intersection LOS: F	
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

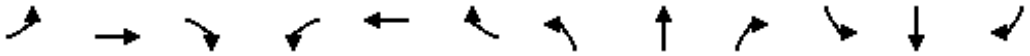
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: S Royal Oaks & Riverside Dr & Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	1026	58	832	1087	249	131	315	873	293	394	165
Future Volume (vph)	191	1026	58	832	1087	249	131	315	873	293	394	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.950	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3315	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3315	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				106					51	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		350			691			792			964	
Travel Time (s)		6.0			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	208	1103	72	956	1195	280	177	380	981	353	415	206
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	1175	0	956	1195	280	177	380	981	353	621	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

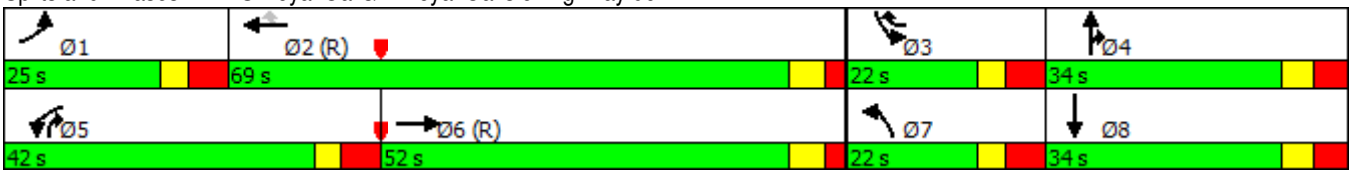


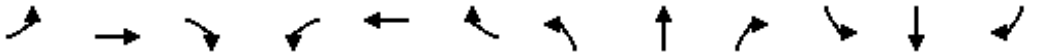
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	16.7	48.0		37.0	68.3	88.8	14.5	29.5	71.0	16.5	31.5	
Actuated g/C Ratio	0.11	0.32		0.25	0.46	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.54	0.74		1.16	0.74	0.27	0.53	0.52	0.72	0.95	0.84	
Control Delay	68.0	48.7		119.7	46.5	14.5	60.0	50.1	46.5	100.9	63.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	68.0	48.7		119.7	46.5	14.5	60.0	50.1	46.5	100.9	63.9	
LOS	E	D		F	D	B	E	D	D	F	E	
Approach Delay		51.6			71.6			49.0			77.3	
Approach LOS		D			E			D			E	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	15.9	45.5		34.5	64.1	14.5	14.4	26.5		14.5	26.6	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	14.4	45.5		34.5	65.6	14.5	12.9	26.5		14.5	28.1	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	12.8	45.5		34.5	67.2	14.5	11.5	26.5		14.5	29.5	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	10.5	45.5		34.5	69.5	14.5	9.4	26.5		14.5	31.6	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	176	942		714	982	166	122	276	771	266	474	
Fuel Used(gal)	5	23		34	29	4	3	7	18	10	14	
CO Emissions (g/hr)	337	1578		2378	2008	306	216	467	1253	677	985	
NOx Emissions (g/hr)	66	307		463	391	60	42	91	244	132	192	
VOC Emissions (g/hr)	78	366		551	465	71	50	108	290	157	228	
Dilemma Vehicles (#)	0	36		0	37	0	0	0	0	0	0	
Queue Length 50th (ft)	100	374		~580	551	113	87	175	539	179	287	
Queue Length 95th (ft)	141	431		m#499	m492	m120	m92	m211	m623	#242	#398	
Internal Link Dist (ft)		270			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1610	1021	383	730	1369	372	735	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.45	0.74		1.16	0.74	0.27	0.46	0.52	0.72	0.95	0.84	

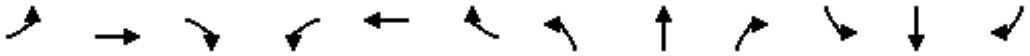
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 62.6		Intersection LOS: E	
Intersection Capacity Utilization 81.9%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 7: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1807	446	264	834	0	0	0	0	846	0	1293
Future Volume (vph)	0	1807	446	264	834	0	0	0	0	846	0	1293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			405									177
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	1943	572	372	970	0	0	0	0	972	0	1469
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1943	572	372	970	0	0	0	0	972	0	1469
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.89	0.71	1.25	0.52					0.71		1.24
Control Delay		63.5	27.3	190.8	21.8					41.5		151.8
Queue Delay		0.0	0.0	0.0	0.3					0.2		0.0
Total Delay		63.5	27.3	190.8	22.1					41.8		151.8
LOS		E	C	F	C					D		F
Approach Delay		55.3			68.9							
Approach LOS		E			E							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1680	414	205	393					695		956
Fuel Used(gal)		54	10	13	11					16		53
CO Emissions (g/hr)		3808	710	927	748					1134		3733
NOx Emissions (g/hr)		741	138	180	146					221		726
VOC Emissions (g/hr)		882	164	215	173					263		865
Dilemma Vehicles (#)		109	0	0	34					0		0
Queue Length 50th (ft)		564	279	~464	239					409		~953
Queue Length 95th (ft)		m612	265	#465	337					465		#1065
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	805	297	1865					1368		1180
Starvation Cap Reductn		0	0	0	353					0		0
Spillback Cap Reductn		0	0	0	0					57		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.89	0.71	1.25	0.64					0.74		1.24

Intersection Summary

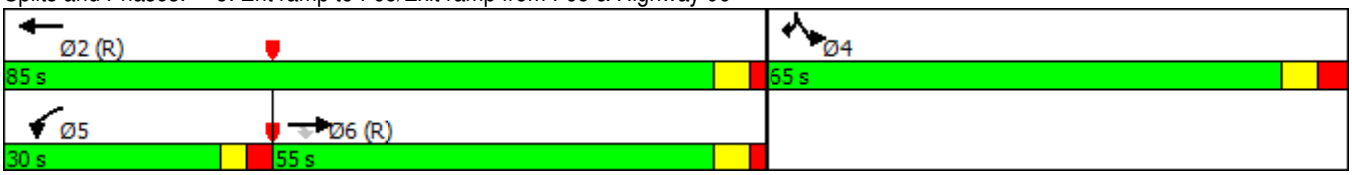
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 78.6		Intersection LOS: E	
Intersection Capacity Utilization 79.1%		ICU Level of Service D	
Analysis Period (min) 15			

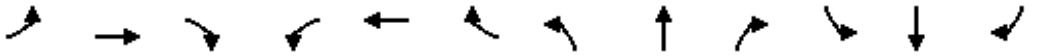
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

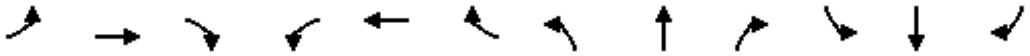
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	538	2115	0	0	814	924	284	0	152	0	0	0
Future Volume (vph)	538	2115	0	0	814	924	284	0	152	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						301			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	555	2158	0	0	895	994	309	0	175	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	555	2158	0	0	895	994	309	0	175	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

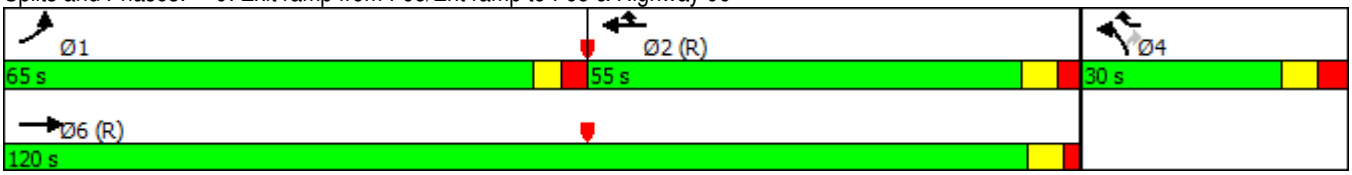


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	33.1	115.2			75.6	106.4	21.3		21.3			
Actuated g/C Ratio	0.22	0.77			0.50	0.71	0.14		0.14			
v/c Ratio	0.77	0.83			0.50	0.48	0.66		0.61			
Control Delay	78.3	19.8			27.0	7.5	68.0		45.7			
Queue Delay	0.0	1.5			0.0	0.0	0.0		0.0			
Total Delay	78.3	21.3			27.0	7.5	68.0		45.7			
LOS	E	C			C	A	E		D			
Approach Delay		33.0			16.8							
Approach LOS		C			B							
90th %ile Green (s)	40.9	114.0			66.6		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	36.1	114.0			71.4		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	33.3	114.0			74.2		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	29.6	114.7			78.6		21.8		21.8			
30th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
10th %ile Green (s)	25.4	119.3			87.4		17.2		17.2			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	537	1522			532	278	266		86			
Fuel Used(gal)	16	31			20	16	7		3			
CO Emissions (g/hr)	1110	2200			1390	1099	462		184			
NOx Emissions (g/hr)	216	428			270	214	90		36			
VOC Emissions (g/hr)	257	510			322	255	107		43			
Dilemma Vehicles (#)	0	77			27	0	0		0			
Queue Length 50th (ft)	297	362			305	150	148		97			
Queue Length 95th (ft)	m341	368			406	234	201		172			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2588			1784	2085	495		298			
Starvation Cap Reductn	0	244			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.43	0.92			0.50	0.48	0.62		0.59			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 29.5		Intersection LOS: C	
Intersection Capacity Utilization 79.1%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 9: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	85	766	13	136	35	109	77	22	69	118	708	134
Future Volume (vph)	85	766	13	136	35	109	77	22	69	118	708	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.893				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1608	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.127	0.950		0.732			0.317			0.295		
Satd. Flow (perm)	205	3319	1531	1318	1608	0	590	1925	1583	550	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		101				77		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	127	815	21	172	60	149	103	38	75	157	944	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	815	21	172	209	0	103	38	75	157	1138	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	80.6	67.8	67.8	29.4	17.1		28.2	16.3	30.6	76.7	65.7	
Actuated g/C Ratio	0.67	0.56	0.56	0.24	0.14		0.24	0.14	0.26	0.64	0.55	
v/c Ratio	0.47	0.43	0.02	0.46	0.66		0.42	0.15	0.16	0.35	0.72	
Control Delay	13.5	17.0	0.1	39.6	34.2		38.6	43.7	7.1	10.0	22.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	13.5	17.0	0.1	39.6	34.2		38.6	43.7	7.1	10.0	22.5	
LOS	B	B	A	D	C		D	D	A	A	C	
Approach Delay		16.2			36.6			28.6		20.9		
Approach LOS		B			D			C		C		
90th %ile Green (s)	12.0	57.5	57.5	8.5	22.5		8.5	22.5	8.0	8.0	53.5	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	62.2	62.2	8.5	17.8		8.5	17.8	8.0	8.0	58.2	
70th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	9.6	65.9	65.9	8.5	14.5		8.5	14.5	7.6	7.6	63.9	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Gap	Gap	Coord	
30th %ile Green (s)	7.2	70.2	70.2	25.3	11.2		8.1	0.0	7.0	7.0	70.0	
30th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	75.5	75.5	20.0	7.0		7.0	0.0	7.0	7.0	75.5	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Min	Skip	Min	Min	Coord	
Stops (vph)	29	432	0	111	70		58	19	10	45	563	
Fuel Used(gal)	1	8	0	2	2		2	1	1	2	18	
CO Emissions (g/hr)	53	583	4	165	151		116	36	44	139	1232	
NOx Emissions (g/hr)	10	113	1	32	29		23	7	9	27	240	
VOC Emissions (g/hr)	12	135	1	38	35		27	8	10	32	285	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	31	180	0	109	79		63	26	0	38	321	
Queue Length 95th (ft)	47	268	0	137	63		82	35	33	64	356	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	301	1874	921	377	496		248	505	467	460	1585	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.42	0.43	0.02	0.46	0.42		0.42	0.08	0.16	0.34	0.72	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 22.0	Intersection LOS: C
Intersection Capacity Utilization 56.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 23: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	83	955	25	77	59	114	43	54	267	215	964	86
Future Volume (vph)	83	955	25	77	59	114	43	54	267	215	964	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	12	11	12	12	11	12
Grade (%)	1%					-1%	2%				-2%	
Storage Length (ft)		135			100		120	0			220	0
Storage Lanes		3			1		1	1			2	0
Taper Length (ft)					50		50				50	
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95
Frt		0.850	0.850					0.850			0.986	
Flt Protected				0.950	0.950		0.950			0.950	0.957	
Satd. Flow (prot)	1764	2707	1575	1736	1754	0	1752	1546	0	1805	3365	0
Flt Permitted	0.202			0.147	0.950		0.677			0.171	0.957	
Satd. Flow (perm)	356	2707	1575	269	1754	0	1248	1546	0	325	3365	0
Right Turn on Red			Yes						Yes			Yes
Satd. Flow (RTOR)			124					159			76	
Link Speed (mph)	30					30	30				30	
Link Distance (ft)	1624					433	515				792	
Travel Time (s)	36.9					9.8	11.7				18.0	
Peak Hour Factor	0.79	0.95	0.64	0.86	0.71	0.82	0.75	0.88	0.94	0.75	0.90	0.76
Heavy Vehicles (%)	0%	1%	2%	1%	0%	0%	2%	0%	0%	1%	1%	0%
Adj. Flow (vph)	105	1005	39	90	83	139	57	61	284	287	1071	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	1005	39	90	83	139	57	345	0	287	1184	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Left	Left	Right	Right	Left	Left	Right
Median Width(ft)	22					22	12				35	
Link Offset(ft)	0					0	0				0	
Crosswalk Width(ft)	16					16	16				16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	1.04	1.04	0.99	1.01	1.06	1.01	0.99	1.03	0.99
Turning Speed (mph)		9	9	15	15		15	9	9	15	15	9
Number of Detectors	1	1	0	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	42	50	42	42		42	226	
Trailing Detector (ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Position(ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Size(ft)	45	6	50	45	45	50	45	45		45	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	NA	custom	custom	custom	Prot	NA	D.Pm	Prot		pm+pt	Prot	
Protected Phases	1	6			4	2!		8		5	2!	
Permitted Phases	6		6	8			4			2		
Detector Phase	1	6		8	4	2	4	8		5	2	
Switch Phase												

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Minimum Initial (s)	5.0	10.0	10.0	7.0	7.0	10.0	7.0	7.0		5.0	10.0	
Minimum Split (s)	15.0	70.0	70.0	50.0	50.0	85.0	50.0	50.0		30.0	85.0	
Total Split (s)	14.0	72.0	72.0	49.0	49.0	87.0	49.0	49.0		29.0	87.0	
Total Split (%)	9.3%	48.0%	48.0%	32.7%	32.7%	58.0%	32.7%	32.7%		19.3%	58.0%	
Maximum Green (s)	7.5	66.0	66.0	42.0	42.0	81.0	42.0	42.0		22.5	81.0	
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.0	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	3.5	2.5	3.5	3.5		3.5	2.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-2.5	-2.5		-2.5	-2.5		-1.0	-3.0	
Total Lost Time (s)	5.5	3.0	3.0	4.5	4.5		4.5	4.5		5.5	3.0	
Lead/Lag	Lead	Lag	Lag			Lag				Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	None	C-Min	None	None		None	C-Min	
Walk Time (s)		7.0	7.0	8.0	8.0	7.0	8.0	8.0			7.0	
Flash Dont Walk (s)		16.0	16.0	35.0	32.0	20.0	32.0	35.0			20.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0			0	
Act Effct Green (s)	92.8	86.9	86.9	32.0	32.0	0.0	32.0	32.0		107.3	96.6	
Actuated g/C Ratio	0.62	0.58	0.58	0.21	0.21	0.00	0.21	0.21		0.72	0.64	
v/c Ratio	0.35	0.64	0.04	1.58	0.22	no cap	0.21	0.76		0.70	0.54	
Control Delay	12.9	26.8	0.1	368.0	47.0		46.8	38.9		23.9	9.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.9	
Total Delay	12.9	26.8	0.1	368.0	47.0	Error	46.8	38.9		23.9	9.9	
LOS	B	C	A	F	D	F	D	D		C	A	
Approach Delay	24.6					Err	40.0				12.6	
Approach LOS	C					F	D				B	
90th %ile Green (s)	7.5	66.0	66.0	42.0	42.0	81.0	42.0	42.0		22.5	81.0	
90th %ile Term Code	Max	Coord	Coord	Max	Hold	Coord	Hold	Max		Max	Coord	
70th %ile Green (s)	7.5	71.0	71.0	37.0	37.0	86.0	37.0	37.0		22.5	86.0	
70th %ile Term Code	Max	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Max	Coord	
50th %ile Green (s)	7.5	82.0	82.0	30.6	30.6	92.4	30.6	30.6		17.9	92.4	
50th %ile Term Code	Max	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Gap	Coord	
30th %ile Green (s)	7.5	93.3	93.3	24.0	24.0	99.0	24.0	24.0		13.2	99.0	
30th %ile Term Code	Max	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Gap	Coord	
10th %ile Green (s)	6.6	107.4	107.4	14.1	14.1	109.8	14.1	14.1		9.0	109.8	
10th %ile Term Code	Gap	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Gap	Coord	
Stops (vph)	35	653	0	56	46	0	34	167		134	592	
Fuel Used(gal)	1	21	0	6	1	0	1	5		3	12	
CO Emissions (g/hr)	102	1461	22	443	71	27	54	332		218	817	
NOx Emissions (g/hr)	20	284	4	86	14	5	10	65		42	159	
VOC Emissions (g/hr)	24	339	5	103	16	6	12	77		50	189	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0		0	0	
Queue Length 50th (ft)	29	372	0	~122	67	0	46	176		115	163	
Queue Length 95th (ft)	55	577	0	#209	82	0	66	258		m80	m411	
Internal Link Dist (ft)	1544					353	435				712	
Turn Bay Length (ft)		135	135	100	100		120			220	220	
Base Capacity (vph)	300	1568	964	79	520	1	370	570		465	2194	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	654	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Reduced v/c Ratio	0.35	0.64	0.04	1.14	0.16	139.00	0.15	0.61		0.62	0.77	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 123 (82%), Referenced to phase 2:SBSW and 6:NBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: Err			
Intersection Signal Delay: Err		Intersection LOS: F	
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

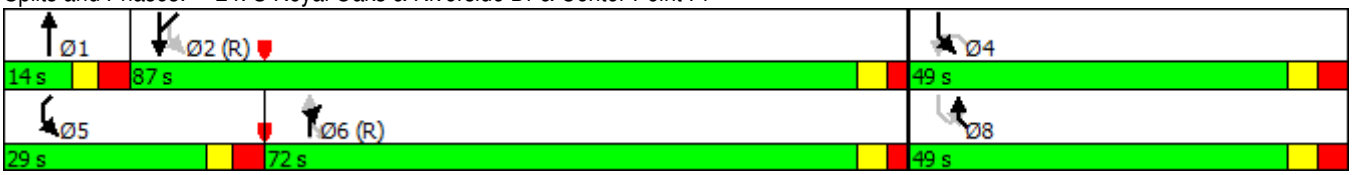
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 24: S Royal Oaks & Riverside Dr & Center Point Pl



HCS 2010 Two-Way Stop Control Summary Report

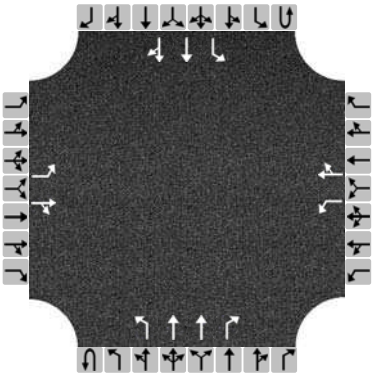
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Existing)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		24	1	8		13	0	11		9	1281	23		45	586	47
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		25		9		13		11		9				46		
Capacity		203		461		130		410		944				519		
v/c Ratio		0.12		0.02		0.10		0.03		0.01				0.09		
95% Queue Length		0.4		0.1		0.3		0.1		0.0				0.3		
Control Delay (s/veh)		25.2		13.0		35.8		14.0		8.8				12.6		
Level of Service (LOS)		D		B		E		B		A				B		
Approach Delay (s/veh)	21.9				25.8				0.1				0.8			
Approach LOS	C				D				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

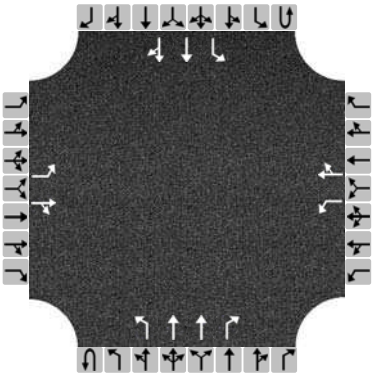
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Existing)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		24	3	15		19	4	22		6	896	16		20	883	97
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		25		19		20		27		6				21		
Capacity		183		391		199		411		688				731		
v/c Ratio		0.14		0.05		0.10		0.07		0.01				0.03		
95% Queue Length		0.5		0.2		0.3		0.2		0.0				0.1		
Control Delay (s/veh)		27.7		14.7		25.1		14.4		10.3				10.1		
Level of Service (LOS)		D		B		D		B		B				B		
Approach Delay (s/veh)	22.1				18.9				0.1				0.2			
Approach LOS	C				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

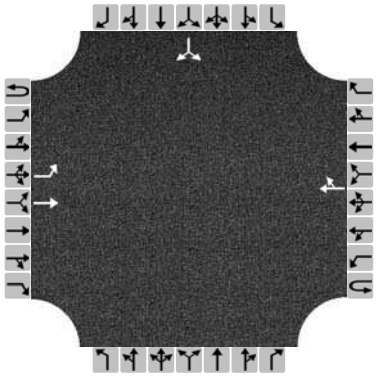
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Existing)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		2	44				183	0						1		1
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		2													2	
Capacity		1351													761	
v/c Ratio		0.00													0.00	
95% Queue Length		0.0													0.0	
Control Delay (s/veh)		7.7													9.7	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.3												9.7			
Approach LOS	A												A			

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HCS 2010 Two-Way Stop Control Summary Report

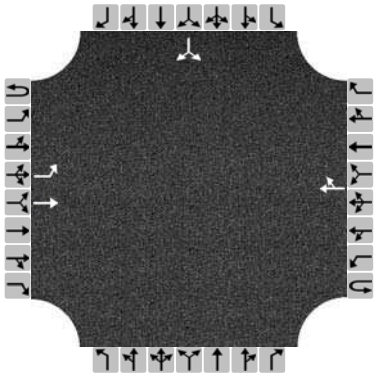
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Existing)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		5	161				166	2						15		2
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		6													21	
Capacity		1373													660	
v/c Ratio		0.00													0.03	
95% Queue Length		0.0													0.1	
Control Delay (s/veh)		7.6													10.6	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.2												10.6			
Approach LOS	A												B			

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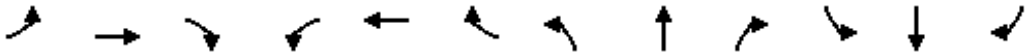
BACKGROUND CONDITIONS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	831	993	281	99	239	988	225	202	82
Future Volume (vph)	112	772	60	831	993	281	99	239	988	225	202	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3235	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3235	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				173					34	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		350			691			792			964	
Travel Time (s)		6.0			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	894	1091	319	121	299	1062	245	273	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	894	1091	319	121	299	1062	245	374	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

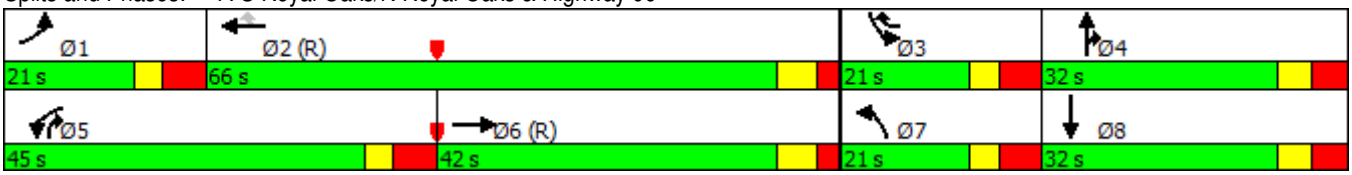


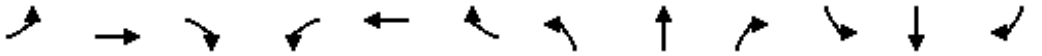
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.5	38.4		40.0	64.9	84.0	12.4	27.5	72.0	15.1	30.2	
Actuated g/C Ratio	0.10	0.27		0.29	0.46	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.43	0.72		0.95	0.69	0.31	0.41	0.42	0.72	0.69	0.52	
Control Delay	63.3	49.3		57.0	40.9	7.8	56.3	41.6	43.5	70.7	47.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.3	49.3		57.0	40.9	7.8	56.3	41.6	43.5	70.7	47.1	
LOS	E	D		E	D	A	E	D	D	E	D	
Approach Delay		51.1			42.6			44.2			56.4	
Approach LOS		D			D			D			E	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	13.3	24.5		13.5	24.7	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.4	35.5		37.5	60.6	13.5	11.6	24.5		13.5	26.4	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	11.2	35.5		37.5	61.8	13.5	10.4	24.5		13.5	27.6	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.9	35.5		37.5	63.1	13.5	9.2	24.5		13.5	28.8	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	8.1	37.6		37.5	67.0	11.4	7.5	24.5		11.4	28.4	
10th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	103	730		736	955	86	89	206	937	214	225	
Fuel Used(gal)	3	17		24	26	4	2	5	20	6	6	
CO Emissions (g/hr)	190	1223		1650	1796	249	156	324	1401	427	427	
NOx Emissions (g/hr)	37	238		321	349	48	30	63	273	83	83	
VOC Emissions (g/hr)	44	283		382	416	58	36	75	325	99	99	
Dilemma Vehicles (#)	0	29		0	36	0	0	0	0	0	0	
Queue Length 50th (ft)	62	281		409	535	65	55	127	573	112	144	
Queue Length 95th (ft)	85	335		m435	m554	m109	72	150	632	159	159	
Internal Link Dist (ft)		270			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1293		938	1578	1045	370	714	1473	367	724	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.72		0.95	0.69	0.31	0.33	0.42	0.72	0.67	0.52	

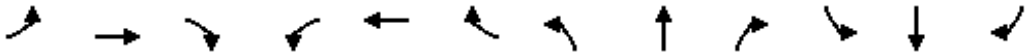
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 46.3		Intersection LOS: D	
Intersection Capacity Utilization 70.5%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 7: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1728	187	111	1055	0	0	0	0	355	0	1026
Future Volume (vph)	0	1728	187	111	1055	0	0	0	0	355	0	1026
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182									117
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1899	208	129	1213	0	0	0	0	418	0	1091
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1899	208	129	1213	0	0	0	0	418	0	1091
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.5	60.5	15.5	81.0					49.5		49.5
Actuated g/C Ratio		0.43	0.43	0.11	0.58					0.35		0.35
v/c Ratio		0.69	0.28	0.65	0.62					0.36		1.08
Control Delay		27.8	5.1	71.1	19.1					34.6		89.4
Queue Delay		0.5	0.0	0.0	0.3					2.1		0.0
Total Delay		28.3	5.1	71.1	19.4					36.7		89.4
LOS		C	A	E	B					D		F
Approach Delay		26.0			24.3							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		57.6	57.6	15.4	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		59.8	59.8	13.2	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.2	63.2	9.8	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		1097	39	111	500					256		827
Fuel Used(gal)		35	2	3	13					6		30
CO Emissions (g/hr)		2415	146	218	908					431		2069
NOx Emissions (g/hr)		470	28	42	177					84		403
VOC Emissions (g/hr)		560	34	50	211					100		480
Dilemma Vehicles (#)		50	0	0	33					0		0
Queue Length 50th (ft)		340	27	125	282					144		~586
Queue Length 95th (ft)		388	m50	m163	m294					178		#738
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2743	755	229	1960					1162		1014
Starvation Cap Reductn		0	0	0	217					0		0
Spillback Cap Reductn		379	0	0	0					581		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.80	0.28	0.56	0.70					0.72		1.08

Intersection Summary

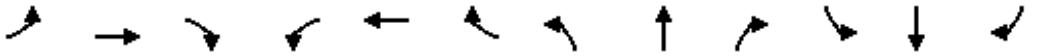
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.08			
Intersection Signal Delay: 40.4		Intersection LOS: D	
Intersection Capacity Utilization 107.3%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

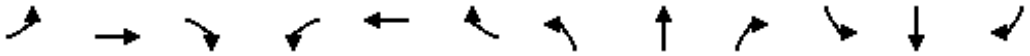
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1336	747	0	0	759	1217	407	0	364	0	0	0
Future Volume (vph)	1336	747	0	0	759	1217	407	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			258			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1518	869	0	0	799	1242	428	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1518	869	0	0	799	1242	428	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.29	0.33			0.59	0.77	1.10		0.95			
Control Delay	186.0	3.2			36.7	27.0	131.0		53.3			
Queue Delay	0.7	0.1			0.0	0.0	0.0		0.0			
Total Delay	186.7	3.3			36.7	27.0	131.0		53.3			
LOS	F	A			D	C	F		D			
Approach Delay		119.9			30.8							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	967	101			591	899	348		115			
Fuel Used(gal)	65	4			21	31	15		7			
CO Emissions (g/hr)	4552	300			1467	2149	1018		455			
NOx Emissions (g/hr)	886	58			285	418	198		89			
VOC Emissions (g/hr)	1055	70			340	498	236		105			
Dilemma Vehicles (#)	0	17			27	0	0		0			
Queue Length 50th (ft)	~899	68			303	468	~227		135			
Queue Length 95th (ft)	#1028	76			372	573	#337		#341			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		419			
Starvation Cap Reductn	163	612			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.49	0.44			0.59	0.77	1.10		0.95			

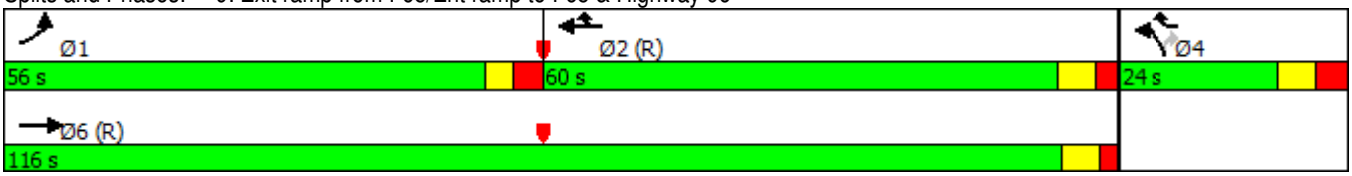
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 81.2		Intersection LOS: F	
Intersection Capacity Utilization 107.3%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



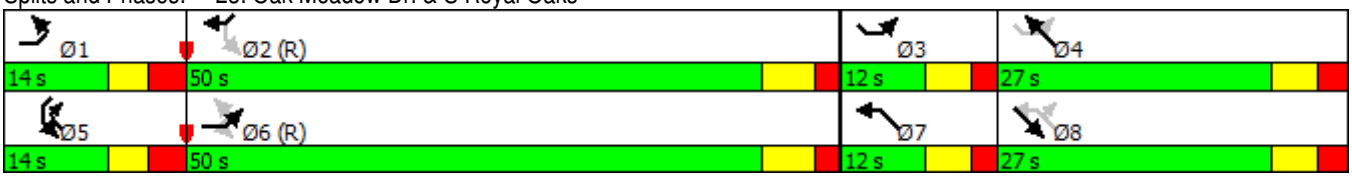
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	29	129	7	71	21	16	170	36	515	73
Future Volume (vph)	87	1120	29	129	7	71	21	16	170	36	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.867				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1561	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.278	0.950		0.739			0.540			0.177		
Satd. Flow (perm)	449	3319	1531	1331	1561	0	1006	1925	1583	330	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		97				90		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		1875			721			918		1624		
Travel Time (s)		42.6			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	46	163	12	97	28	28	185	48	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1191	46	163	109	0	28	28	185	48	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	74.6	63.7	63.7	17.0	11.1		17.0	11.1	24.1	73.9	63.4	
Actuated g/C Ratio	0.72	0.62	0.62	0.17	0.11		0.17	0.11	0.23	0.72	0.62	
v/c Ratio	0.30	0.58	0.05	0.64	0.43		0.12	0.14	0.42	0.13	0.45	
Control Delay	6.5	14.4	0.1	48.7	16.3		32.2	42.1	19.9	5.6	10.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	6.5	14.4	0.1	48.7	16.3		32.2	42.1	19.9	5.6	10.3	
LOS	A	B	A	D	B		C	D	B	A	B	
Approach Delay		13.2			35.7			23.9		10.0		
Approach LOS		B			D			C		A		
90th %ile Green (s)	8.0	53.7	53.7	6.5	12.3		6.5	12.3	7.0	7.0	52.7	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.6	57.0	57.0	6.5	9.0		6.5	9.0	7.0	7.0	56.4	
70th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
50th %ile Green (s)	7.0	58.5	58.5	6.5	7.5		6.5	7.5	7.0	7.0	58.5	
50th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
30th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
30th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
Stops (vph)	25	656	0	116	19		17	15	74	11	250	
Fuel Used(gal)	2	23	0	3	1		0	0	2	1	10	
CO Emissions (g/hr)	107	1628	30	176	57		30	27	173	39	703	
NOx Emissions (g/hr)	21	317	6	34	11		6	5	34	8	137	
VOC Emissions (g/hr)	25	377	7	41	13		7	6	40	9	163	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	23	246	0	93	7		15	17	52	8	125	
Queue Length 95th (ft)	35	351	0	127	15		30	27	110	18	147	
Internal Link Dist (ft)		1795			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	438	2054	1006	254	431		232	439	453	386	1775	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.30	0.58	0.05	0.64	0.25		0.12	0.06	0.41	0.12	0.45	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 23: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	28	1198	103	6	46	41	33	12	96	267	747	25
Future Volume (vph)	28	1198	103	6	46	41	33	12	96	267	747	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	12	11	12	12	11	12
Grade (%)	1%					-1%	2%				-2%	
Storage Length (ft)		135			100		120	0			220	0
Storage Lanes		3			1		1	1			2	0
Taper Length (ft)					50		50				50	
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95
Frt		0.850	0.850					0.850			0.993	
Flt Protected				0.950	0.950		0.950			0.950	0.955	
Satd. Flow (prot)	1764	2707	1607	1754	1580	0	1787	1486	0	1787	3343	0
Flt Permitted	0.351			0.423	0.950		0.691			0.137	0.955	
Satd. Flow (perm)	619	2707	1607	781	1580	0	1300	1486	0	258	3343	0
Right Turn on Red			Yes						Yes			Yes
Satd. Flow (RTOR)			82					112			82	
Link Speed (mph)	30					30	30				30	
Link Distance (ft)	1624					433	515				792	
Travel Time (s)	36.9					9.8	11.7				18.0	
Peak Hour Factor	0.63	0.92	0.87	0.58	0.68	0.77	0.67	0.63	0.86	0.80	0.99	0.67
Heavy Vehicles (%)	0%	1%	0%	0%	11%	0%	0%	10%	3%	2%	2%	4%
Adj. Flow (vph)	44	1302	118	10	68	53	49	19	112	334	755	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1302	118	10	68	53	49	131	0	334	792	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Left	Left	Right	Right	Left	Left	Right
Median Width(ft)	22					22	12				35	
Link Offset(ft)	0					0	0				0	
Crosswalk Width(ft)	16					16	16				16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	1.04	1.04	0.99	1.01	1.06	1.01	0.99	1.03	0.99
Turning Speed (mph)		9	9	15	15		15	9	9	15	15	9
Number of Detectors	1	1	0	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	42	50	42	42		42	226	
Trailing Detector (ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Position(ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Size(ft)	45	6	50	45	45	50	45	45		45	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	NA	custom	custom	custom	Prot	NA	D.Pm	Prot		pm+pt	Prot	
Protected Phases	1	6			4			8		5	2	
Permitted Phases	6		6	8			4			2		
Detector Phase	1	6		8	4		4	8		5	2	
Switch Phase												

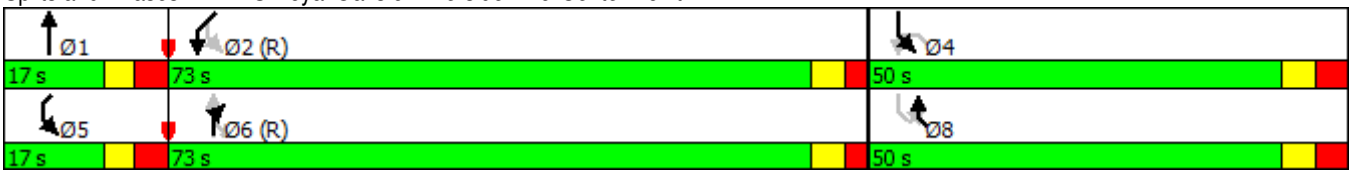
Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Minimum Initial (s)	5.0	10.0	10.0	7.0	7.0		7.0	7.0		5.0	10.0	
Minimum Split (s)	17.0	73.0	73.0	50.0	50.0		50.0	50.0		17.0	73.0	
Total Split (s)	17.0	73.0	73.0	50.0	50.0		50.0	50.0		17.0	73.0	
Total Split (%)	12.1%	52.1%	52.1%	35.7%	35.7%		35.7%	35.7%		12.1%	52.1%	
Maximum Green (s)	10.5	67.0	67.0	43.0	43.0		43.0	43.0		10.5	67.0	
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5		3.5	3.5		3.0	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	3.5		3.5	3.5		3.5	2.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-2.5	-2.5		-2.5	-2.5		-1.0	-3.0	
Total Lost Time (s)	5.5	3.0	3.0	4.5	4.5		4.5	4.5		5.5	3.0	
Lead/Lag	Lead	Lag	Lag							Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	None		None	None		None	C-Min	
Walk Time (s)		7.0	7.0	8.0	8.0		8.0	8.0			7.0	
Flash Dont Walk (s)		16.0	16.0	35.0	32.0		32.0	35.0			20.0	
Pedestrian Calls (#/hr)		0	0	0	0		0	0			0	
Act Effct Green (s)	106.2	101.1	101.1	14.4	14.4	0.0	14.4	14.4		114.1	107.4	
Actuated g/C Ratio	0.76	0.72	0.72	0.10	0.10	0.00	0.10	0.10		0.82	0.77	
v/c Ratio	0.08	0.67	0.10	0.12	0.42	no cap	0.37	0.52		1.00	0.31	
Control Delay	3.3	13.0	2.6	58.5	65.8		65.1	21.2		70.3	8.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.3	13.0	2.6	58.5	65.8	Error	65.1	21.2		70.3	8.3	
LOS	A	B	A	E	E	F	E	C		E	A	
Approach Delay	11.9					Err	33.2				26.7	
Approach LOS	B					F	C				C	
90th %ile Green (s)	7.5	93.3	93.3	16.7	16.7		16.7	16.7		10.5	96.3	
90th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
70th %ile Green (s)	6.9	96.2	96.2	13.8	13.8		13.8	13.8		10.5	99.8	
70th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
50th %ile Green (s)	6.6	98.1	98.1	11.9	11.9		11.9	11.9		10.5	102.0	
50th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
30th %ile Green (s)	6.3	100.0	100.0	10.0	10.0		10.0	10.0		10.5	104.2	
30th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
10th %ile Green (s)	0.0	102.8	102.8	7.2	7.2		7.2	7.2		10.5	119.8	
10th %ile Term Code	Skip	Coord	Coord	Hold	Hold		Hold	Hold		Max	Coord	
Stops (vph)	6	624	11	6	41	0	30	25		205	368	
Fuel Used(gal)	0	22	1	0	1	0	1	1		7	8	
CO Emissions (g/hr)	28	1523	99	9	70	10	51	73		462	567	
NOx Emissions (g/hr)	6	296	19	2	14	2	10	14		90	110	
VOC Emissions (g/hr)	7	353	23	2	16	2	12	17		107	131	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0		0	0	
Queue Length 50th (ft)	6	326	8	8	59	0	42	16		168	68	
Queue Length 95th (ft)	10	459	28	17	79	0	61	24		m#163	m336	
Internal Link Dist (ft)	1544					353	435				712	
Turn Bay Length (ft)		135	135	100	100		120			220	220	
Base Capacity (vph)	580	1954	1182	253	513	1	422	558		335	2583	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	

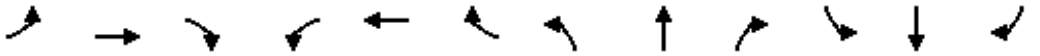
Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Reduced v/c Ratio	0.08	0.67	0.10	0.04	0.13	53.00	0.12	0.23		1.00	0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SWL and 6:NBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: Err			
Intersection Signal Delay: Err		Intersection LOS: F	
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

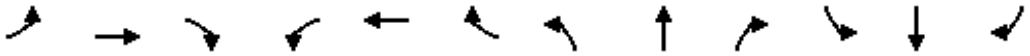
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: S Royal Oaks & Riverside Dr & Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	913	1174	269	141	351	964	316	434	178
Future Volume (vph)	206	1108	63	913	1174	269	141	351	964	316	434	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.951	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3319	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3319	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					49	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		350			691			792			964	
Travel Time (s)		6.0			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1049	1290	302	191	423	1083	381	457	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1049	1290	302	191	423	1083	381	680	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

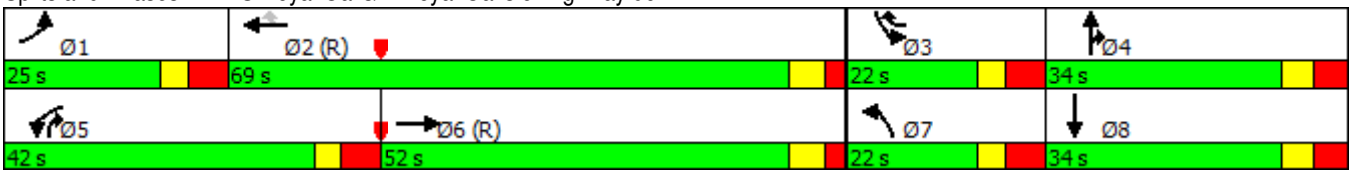


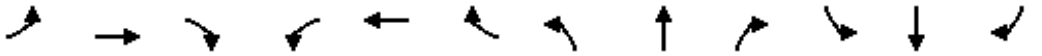
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.27	0.81	0.30	0.55	0.58	0.79	1.02	0.94	
Control Delay	68.2	51.1		163.5	48.8	16.5	57.4	48.2	51.9	117.0	74.6	
Queue Delay	0.0	0.3		0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
Total Delay	68.2	51.4		163.6	48.8	16.5	57.4	48.2	51.9	117.0	74.9	
LOS	E	D		F	D	B	E	D	D	F	E	
Approach Delay		53.9			90.7			51.6			90.0	
Approach LOS		D			F			D			F	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	16.7	45.5		34.5	63.3	14.5	14.5	26.5		14.5	26.5	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)	15.1	45.5		34.5	64.9	14.5	13.5	26.5		14.5	27.5	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	13.4	45.5		34.5	66.6	14.5	12.0	26.5		14.5	29.0	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	11.1	45.5		34.5	68.9	14.5	9.8	26.5		14.5	31.2	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	189	1046		743	1069	205	130	314	913	280	514	
Fuel Used(gal)	5	25		45	32	5	3	7	21	11	17	
CO Emissions (g/hr)	364	1765		3150	2214	356	226	514	1480	800	1171	
NOx Emissions (g/hr)	71	343		613	431	69	44	100	288	156	228	
VOC Emissions (g/hr)	84	409		730	513	83	52	119	343	185	271	
Dilemma Vehicles (#)	0	39		0	44	0	0	0	0	0	0	
Queue Length 50th (ft)	108	415		~680	582	137	92	201	625	~203	327	
Queue Length 95th (ft)	151	475		m#521	m521	m130	m100	m237	m692	#272	#465	
Internal Link Dist (ft)		270			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	727	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	48		20	0	0	0	0	0	0	2	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.83		1.30	0.81	0.30	0.50	0.58	0.79	1.02	0.94	

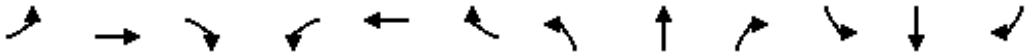
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.27			
Intersection Signal Delay: 73.0		Intersection LOS: E	
Intersection Capacity Utilization 87.4%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 7: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1971	484	285	906	0	0	0	0	914	0	1405
Future Volume (vph)	0	1971	484	285	906	0	0	0	0	914	0	1405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			403									143
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2119	621	401	1053	0	0	0	0	1051	0	1597
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2119	621	401	1053	0	0	0	0	1051	0	1597
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.97	0.77	1.35	0.56					0.77		1.38
Control Delay		70.4	31.0	226.6	25.0					43.9		207.9
Queue Delay		0.8	0.0	0.0	0.7					1.7		0.0
Total Delay		71.2	31.0	226.6	25.7					45.6		207.9
LOS		E	C	F	C					D		F
Approach Delay		62.1			81.1							
Approach LOS		E			F							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1850	520	222	472					776		985
Fuel Used(gal)		62	12	16	13					18		74
CO Emissions (g/hr)		4359	844	1147	886					1262		5163
NOx Emissions (g/hr)		848	164	223	172					246		1005
VOC Emissions (g/hr)		1010	196	266	205					292		1197
Dilemma Vehicles (#)		105	0	0	45					0		0
Queue Length 50th (ft)		628	328	~524	272					457		~1127
Queue Length 95th (ft)		m#672	m295	#520	407					515		#1235
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	804	297	1865					1368		1160
Starvation Cap Reductn		0	0	0	446					0		0
Spillback Cap Reductn		14	0	0	0					166		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.98	0.77	1.35	0.74					0.87		1.38

Intersection Summary

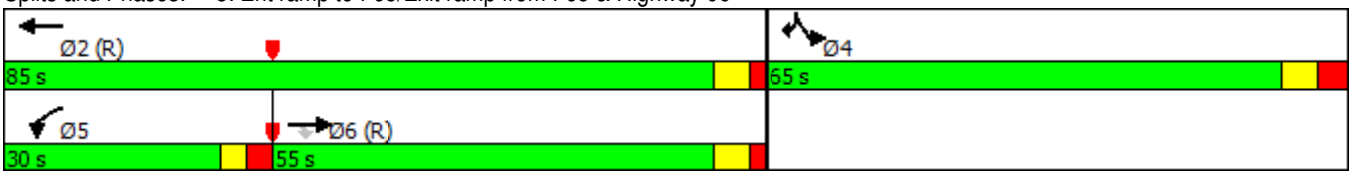
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.38			
Intersection Signal Delay: 97.6		Intersection LOS: F	
Intersection Capacity Utilization 84.7%		ICU Level of Service E	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

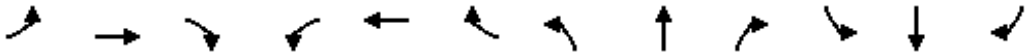
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	595	2290	0	0	882	998	309	0	164	0	0	0
Future Volume (vph)	595	2290	0	0	882	998	309	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						246			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	613	2337	0	0	969	1073	336	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	613	2337	0	0	969	1073	336	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

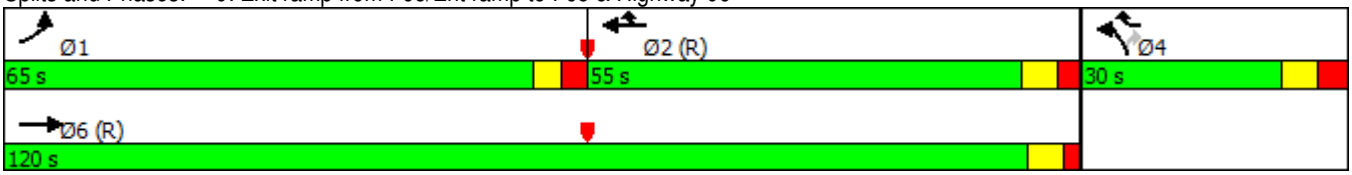


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	35.9	114.7			72.3	103.6	21.8		21.8			
Actuated g/C Ratio	0.24	0.76			0.48	0.69	0.15		0.15			
v/c Ratio	0.78	0.91			0.57	0.54	0.70		0.65			
Control Delay	79.7	23.8			30.4	10.0	69.4		49.0			
Queue Delay	0.0	4.8			0.0	0.0	0.0		0.0			
Total Delay	79.7	28.6			30.4	10.0	69.4		49.0			
LOS	E	C			C	B	E		D			
Approach Delay		39.2			19.7							
Approach LOS		D			B							
90th %ile Green (s)	43.9	114.0			63.6		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	39.0	114.0			68.5		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	36.0	114.0			71.5		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	33.0	114.0			74.5		22.5		22.5			
30th %ile Term Code	Gap	Coord			Coord		Max		Max			
10th %ile Green (s)	27.8	117.5			83.2		19.0		19.0			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	588	1844			621	375	290		100			
Fuel Used(gal)	18	38			23	18	7		3			
CO Emissions (g/hr)	1236	2645			1580	1273	509		208			
NOx Emissions (g/hr)	240	515			307	248	99		40			
VOC Emissions (g/hr)	286	613			366	295	118		48			
Dilemma Vehicles (#)	0	83			29	0	0		0			
Queue Length 50th (ft)	329	582			353	205	162		112			
Queue Length 95th (ft)	m340	m518			467	311	218		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2577			1704	2012	495		298			
Starvation Cap Reductn	0	197			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.48	0.98			0.57	0.53	0.68		0.63			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 34.2		Intersection LOS: C	
Intersection Capacity Utilization 84.7%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 9: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	19	147	41	118	92	29	91	138	765	145
Future Volume (vph)	92	827	19	147	41	118	92	29	91	138	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.896				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1613	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.097	0.950		0.724			0.278			0.265		
Satd. Flow (perm)	157	3319	1531	1304	1613	0	518	1925	1583	494	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		93				99		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	30	186	71	162	123	50	99	184	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	880	30	186	233	0	123	50	99	184	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	78.4	65.3	65.3	31.2	19.4		30.6	19.1	33.0	74.3	63.1	
Actuated g/C Ratio	0.65	0.54	0.54	0.26	0.16		0.26	0.16	0.28	0.62	0.53	
v/c Ratio	0.56	0.49	0.03	0.48	0.69		0.51	0.16	0.20	0.45	0.80	
Control Delay	22.4	19.3	0.1	38.4	38.0		39.3	41.7	6.4	12.4	27.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	22.4	19.3	0.1	38.4	38.0		39.3	41.7	6.4	12.4	27.4	
LOS	C	B	A	D	D		D	D	A	B	C	
Approach Delay		19.1			38.2			27.8		25.5		
Approach LOS		B			D			C		C		
90th %ile Green (s)	12.0	54.9	54.9	8.5	25.1		8.5	25.1	8.0	8.0	50.9	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	59.7	59.7	8.5	20.3		8.5	20.3	8.0	8.0	55.7	
70th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	10.3	63.1	63.1	8.5	16.9		8.5	16.9	8.0	8.0	60.8	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
30th %ile Green (s)	7.7	67.2	67.2	8.5	13.5		8.5	13.5	7.3	7.3	66.8	
30th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Gap	Gap	Coord	
10th %ile Green (s)	7.0	73.9	73.9	21.6	8.6		7.0	0.0	7.0	7.0	73.9	
10th %ile Term Code	Min	Coord	Coord	Hold	Gap		Min	Skip	Min	Min	Coord	
Stops (vph)	40	507	0	118	89		69	23	12	56	640	
Fuel Used(gal)	1	10	0	3	3		2	1	1	2	20	
CO Emissions (g/hr)	72	671	6	175	178		139	46	56	168	1408	
NOx Emissions (g/hr)	14	131	1	34	35		27	9	11	33	274	
VOC Emissions (g/hr)	17	156	1	41	41		32	11	13	39	326	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	36	211	0	116	103		74	34	0	49	395	
Queue Length 95th (ft)	56	308	0	142	80		92	41	37	78	423	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	270	1804	892	385	492		248	505	512	418	1528	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.51	0.49	0.03	0.48	0.47		0.50	0.10	0.19	0.44	0.80	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 25.3	Intersection LOS: C
Intersection Capacity Utilization 60.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 23: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	90	1063	27	83	64	123	46	58	288	232	1063	93
Future Volume (vph)	90	1063	27	83	64	123	46	58	288	232	1063	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	12	11	12	12	11	12
Grade (%)	1%					-1%	2%				-2%	
Storage Length (ft)		135			100		120	0			220	0
Storage Lanes		3			1		1	1			2	0
Taper Length (ft)					50		50				50	
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95
Frt		0.850	0.850					0.850			0.986	
Flt Protected				0.950	0.950		0.950			0.950	0.957	
Satd. Flow (prot)	1764	2707	1575	1736	1754	0	1752	1546	0	1805	3365	0
Flt Permitted	0.166			0.168	0.950		0.670			0.116	0.957	
Satd. Flow (perm)	293	2707	1575	307	1754	0	1236	1546	0	220	3365	0
Right Turn on Red			Yes						Yes			Yes
Satd. Flow (RTOR)			124					158			76	
Link Speed (mph)	30					30	30				30	
Link Distance (ft)	1624					433	515				792	
Travel Time (s)	36.9					9.8	11.7				18.0	
Peak Hour Factor	0.79	0.95	0.64	0.86	0.71	0.82	0.75	0.88	0.94	0.75	0.90	0.76
Heavy Vehicles (%)	0%	1%	2%	1%	0%	0%	2%	0%	0%	1%	1%	0%
Adj. Flow (vph)	114	1119	42	97	90	150	61	66	306	309	1181	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1119	42	97	90	150	61	372	0	309	1303	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Left	Left	Right	Right	Left	Left	Right
Median Width(ft)	22					22	12				35	
Link Offset(ft)	0					0	0				0	
Crosswalk Width(ft)	16					16	16				16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	1.04	1.04	0.99	1.01	1.06	1.01	0.99	1.03	0.99
Turning Speed (mph)		9	9	15	15		15	9	9	15	15	9
Number of Detectors	1	1	0	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	42	50	42	42		42	226	
Trailing Detector (ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Position(ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Size(ft)	45	6	50	45	45	50	45	45		45	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	NA	custom	custom	custom	Prot	NA	D.Pm	Prot		pm+pt	Prot	
Protected Phases	1	6			4	2!		8		5	2!	
Permitted Phases	6		6	8			4			2		
Detector Phase	1	6		8	4	2	4	8		5	2	
Switch Phase												

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Minimum Initial (s)	5.0	10.0	10.0	7.0	7.0	10.0	7.0	7.0		5.0	10.0	
Minimum Split (s)	15.0	70.0	70.0	50.0	50.0	85.0	50.0	50.0		30.0	85.0	
Total Split (s)	14.0	72.0	72.0	49.0	49.0	87.0	49.0	49.0		29.0	87.0	
Total Split (%)	9.3%	48.0%	48.0%	32.7%	32.7%	58.0%	32.7%	32.7%		19.3%	58.0%	
Maximum Green (s)	7.5	66.0	66.0	42.0	42.0	81.0	42.0	42.0		22.5	81.0	
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.0	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	3.5	2.5	3.5	3.5		3.5	2.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-2.5	-2.5		-2.5	-2.5		-1.0	-3.0	
Total Lost Time (s)	5.5	3.0	3.0	4.5	4.5		4.5	4.5		5.5	3.0	
Lead/Lag	Lead	Lag	Lag			Lag				Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	None	C-Min	None	None		None	C-Min	
Walk Time (s)		7.0	7.0	8.0	8.0	7.0	8.0	8.0			7.0	
Flash Dont Walk (s)		16.0	16.0	35.0	32.0	20.0	32.0	35.0			20.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0			0	
Act Effct Green (s)	84.9	79.0	79.0	36.4	36.4	0.0	36.4	36.4		103.6	92.2	
Actuated g/C Ratio	0.57	0.53	0.53	0.24	0.24	0.00	0.24	0.24		0.69	0.61	
v/c Ratio	0.46	0.79	0.05	1.31	0.21	no cap	0.20	0.75		0.82	0.62	
Control Delay	17.9	35.9	0.1	250.3	44.0		43.8	38.5		41.1	13.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	1.5	
Total Delay	17.9	35.9	0.1	250.3	44.0	Error	43.8	38.5		41.1	14.6	
LOS	B	D	A	F	D	F	D	D		D	B	
Approach Delay	33.1					Err	39.3				19.7	
Approach LOS	C					F	D				B	
90th %ile Green (s)	7.5	66.0	66.0	42.0	42.0	81.0	42.0	42.0		22.5	81.0	
90th %ile Term Code	Max	Coord	Coord	Max	Hold	Coord	Hold	Max		Max	Coord	
70th %ile Green (s)	7.5	66.0	66.0	42.0	42.0	81.0	42.0	42.0		22.5	81.0	
70th %ile Term Code	Max	Coord	Coord	Max	Hold	Coord	Hold	Max		Max	Coord	
50th %ile Green (s)	7.5	70.5	70.5	37.5	37.5	85.5	37.5	37.5		22.5	85.5	
50th %ile Term Code	Max	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Max	Coord	
30th %ile Green (s)	7.5	79.5	79.5	29.9	29.9	93.1	29.9	29.9		21.1	93.1	
30th %ile Term Code	Max	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Gap	Coord	
10th %ile Green (s)	6.8	98.0	98.0	18.3	18.3	105.4	18.3	18.3		14.2	105.4	
10th %ile Term Code	Gap	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Gap	Coord	
Stops (vph)	42	838	0	67	48	0	35	190		209	817	
Fuel Used(gal)	2	26	0	5	1	0	1	5		5	15	
CO Emissions (g/hr)	119	1808	24	341	74	29	55	360		317	1030	
NOx Emissions (g/hr)	23	352	5	66	14	6	11	70		62	200	
VOC Emissions (g/hr)	28	419	6	79	17	7	13	83		73	239	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0		0	0	
Queue Length 50th (ft)	37	530	0	~114	69	0	46	195		162	645	
Queue Length 95th (ft)	58	#692	0	#214	88	0	70	293		m114	m571	
Internal Link Dist (ft)	1544					353	435				712	
Turn Bay Length (ft)		135	135	100	100		120			220	220	
Base Capacity (vph)	249	1425	888	91	520	1	366	569		400	2097	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	558	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Reduced v/c Ratio	0.46	0.79	0.05	1.07	0.17	150.00	0.17	0.65		0.77	0.85	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 123 (82%), Referenced to phase 2:SBSW and 6:NBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: Err			
Intersection Signal Delay: Err		Intersection LOS: F	
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

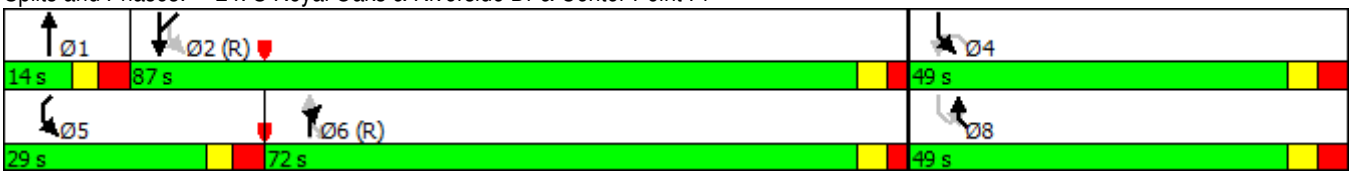
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 24: S Royal Oaks & Riverside Dr & Center Point Pl



HCS 2010 Two-Way Stop Control Summary Report

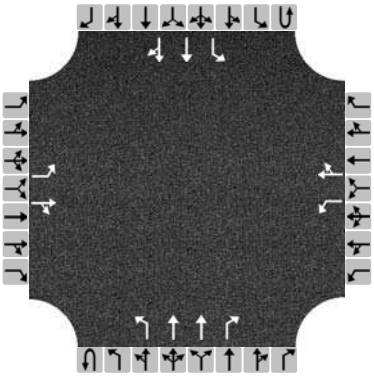
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Background)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	1	9		14	0	17		10	1388	25		61	645	51
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		10		14		18		10				63		
Capacity		165		416		108		377		893				470		
v/c Ratio		0.16		0.02		0.13		0.05		0.01				0.13		
95% Queue Length		0.6		0.1		0.4		0.1		0.0				0.5		
Control Delay (s/veh)		31.0		13.9		43.1		15.0		9.1				13.8		
Level of Service (LOS)		D		B		E		C		A				B		
Approach Delay (s/veh)	26.4				27.3				0.1				1.1			
Approach LOS	D				D				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

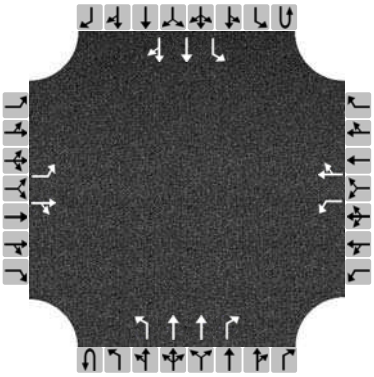
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Background)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	3	16		21	4	40		6	984	17		33	965	105
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		20		22		46		6				34		
Capacity		150		355		170		419		635				675		
v/c Ratio		0.18		0.06		0.13		0.11		0.01				0.05		
95% Queue Length		0.6		0.2		0.4		0.4		0.0				0.2		
Control Delay (s/veh)		34.1		15.7		29.2		14.7		10.7				10.6		
Level of Service (LOS)		D		C		D		B		B				B		
Approach Delay (s/veh)	26.3				19.4				0.1				0.3			
Approach LOS	D				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

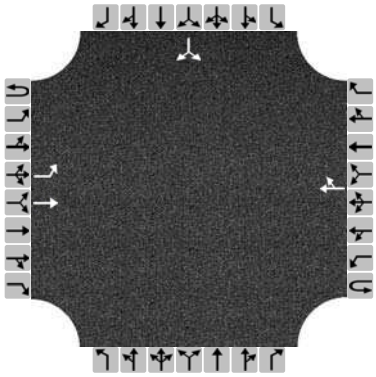
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Background)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		24	48				198	0						1		9
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		30													12	
Capacity		1330													782	
v/c Ratio		0.02													0.02	
95% Queue Length		0.1													0.0	
Control Delay (s/veh)		7.8													9.7	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	2.6												9.7			
Approach LOS	A												A			

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HCS 2010 Two-Way Stop Control Summary Report

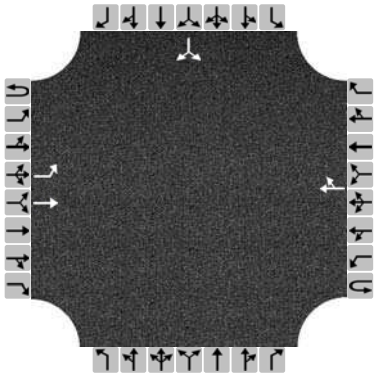
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Background)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		24	174				179	2						16		33
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		30													61	
Capacity		1355													726	
v/c Ratio		0.02													0.08	
95% Queue Length		0.1													0.3	
Control Delay (s/veh)		7.7													10.4	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.9												10.4			
Approach LOS	A												B			

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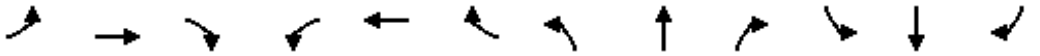
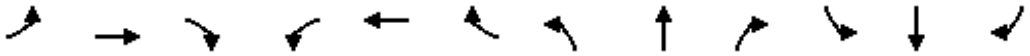
TOTAL PROJECTED CONDITIONS



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	849	993	281	99	276	1060	225	211	82
Future Volume (vph)	112	772	60	849	993	281	99	276	1060	225	211	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				147					32	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		350			691			792			964	
Travel Time (s)		6.0			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	913	1091	319	121	345	1140	245	285	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	913	1091	319	121	345	1140	245	386	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

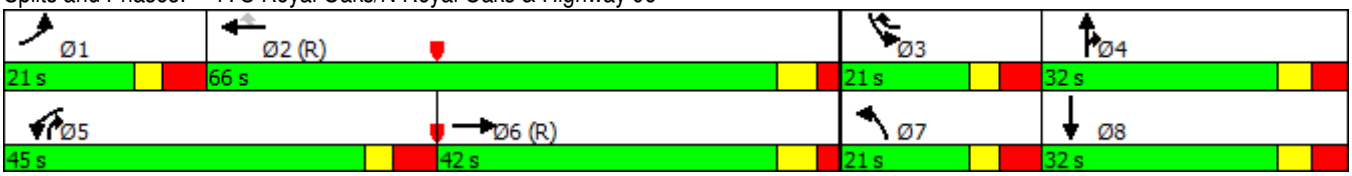


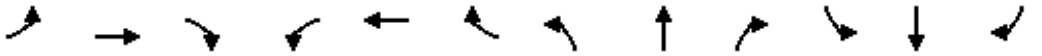
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.5	38.4		40.0	64.9	84.0	12.4	27.5	72.0	15.1	30.2	
Actuated g/C Ratio	0.10	0.27		0.29	0.46	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.43	0.72		0.97	0.69	0.31	0.41	0.48	0.77	0.69	0.53	
Control Delay	63.3	49.3		60.9	40.3	8.7	57.6	42.1	37.4	70.7	47.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.3	49.3		60.9	40.3	8.7	57.6	42.1	37.4	70.7	47.9	
LOS	E	D		E	D	A	E	D	D	E	D	
Approach Delay		51.1			44.0			40.0			56.7	
Approach LOS		D			D			D			E	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	13.3	24.5		13.5	24.7	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.4	35.5		37.5	60.6	13.5	11.6	24.5		13.5	26.4	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	11.2	35.5		37.5	61.8	13.5	10.4	24.5		13.5	27.6	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.9	35.5		37.5	63.1	13.5	9.2	24.5		13.5	28.8	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	8.1	37.6		37.5	67.0	11.4	7.5	24.5		11.4	28.4	
10th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	103	730		759	946	99	88	239	1006	214	235	
Fuel Used(gal)	3	17		25	25	4	2	5	20	6	6	
CO Emissions (g/hr)	190	1223		1736	1781	262	158	377	1411	427	444	
NOx Emissions (g/hr)	37	238		338	346	51	31	73	275	83	86	
VOC Emissions (g/hr)	44	283		402	413	61	37	87	327	99	103	
Dilemma Vehicles (#)	0	29		0	36	0	0	0	0	0	0	
Queue Length 50th (ft)	62	281		419	535	79	51	148	610	112	151	
Queue Length 95th (ft)	85	335		m#446	m547	m123	m71	165	680	159	165	
Internal Link Dist (ft)		270			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1293		938	1578	1035	370	714	1473	367	723	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.72		0.97	0.69	0.31	0.33	0.48	0.77	0.67	0.53	

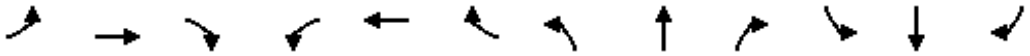
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 45.7		Intersection LOS: D	
Intersection Capacity Utilization 71.8%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 7: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1793	194	111	1060	0	0	0	0	355	0	1039
Future Volume (vph)	0	1793	194	111	1060	0	0	0	0	355	0	1039
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182									115
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1970	216	129	1218	0	0	0	0	418	0	1105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1970	216	129	1218	0	0	0	0	418	0	1105
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.5	60.5	15.5	81.0					49.5		49.5
Actuated g/C Ratio		0.43	0.43	0.11	0.58					0.35		0.35
v/c Ratio		0.72	0.29	0.65	0.62					0.36		1.09
Control Delay		28.3	5.1	71.7	19.3					34.6		94.9
Queue Delay		0.8	0.0	0.0	0.3					2.1		0.0
Total Delay		29.1	5.1	71.7	19.5					36.7		94.9
LOS		C	A	E	B					D		F
Approach Delay		26.7			24.5							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		57.6	57.6	15.4	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		59.8	59.8	13.2	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.2	63.2	9.8	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		1194	39	111	497					256		836
Fuel Used(gal)		37	2	3	13					6		31
CO Emissions (g/hr)		2555	150	219	912					431		2177
NOx Emissions (g/hr)		497	29	43	177					84		423
VOC Emissions (g/hr)		592	35	51	211					100		504
Dilemma Vehicles (#)		50	0	0	34					0		0
Queue Length 50th (ft)		359	28	125	283					144		~602
Queue Length 95th (ft)		408	m46	m162	m296					178		#754
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2743	755	229	1960					1162		1012
Starvation Cap Reductn		0	0	0	216					0		0
Spillback Cap Reductn		426	0	0	0					581		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.85	0.29	0.56	0.70					0.72		1.09

Intersection Summary

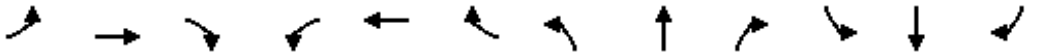
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 41.9		Intersection LOS: D	
Intersection Capacity Utilization 108.8%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

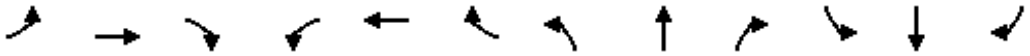
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1386	762	0	0	762	1217	409	0	364	0	0	0
Future Volume (vph)	1386	762	0	0	762	1217	409	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			251			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1575	886	0	0	802	1242	431	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1575	886	0	0	802	1242	431	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.34	0.34			0.59	0.77	1.11		0.96			
Control Delay	206.7	3.4			36.8	27.0	133.3		57.3			
Queue Delay	0.7	0.1			0.0	0.0	0.0		0.0			
Total Delay	207.3	3.5			36.8	27.0	133.3		57.3			
LOS	F	A			D	C	F		E			
Approach Delay		133.9			30.8							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	1009	107			593	899	349		119			
Fuel Used(gal)	73	4			21	31	15		7			
CO Emissions (g/hr)	5135	311			1473	2149	1036		477			
NOx Emissions (g/hr)	999	60			287	418	202		93			
VOC Emissions (g/hr)	1190	72			341	498	240		111			
Dilemma Vehicles (#)	0	18			27	0	0		0			
Queue Length 50th (ft)	~957	67			305	468	~230		143			
Queue Length 95th (ft)	#1083	75			373	573	#340		#353			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		413			
Starvation Cap Reductn	163	623			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.55	0.45			0.59	0.77	1.11		0.96			

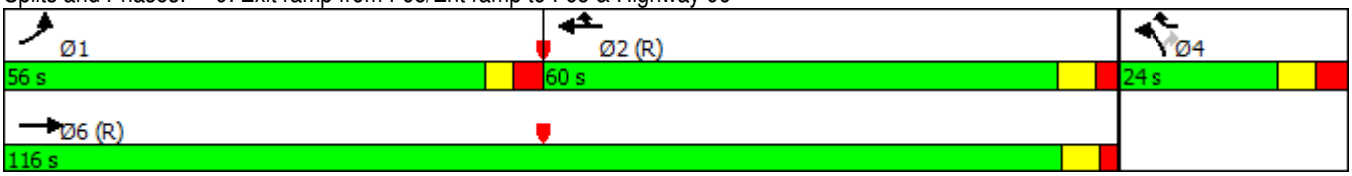
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.34			
Intersection Signal Delay: 88.7		Intersection LOS: F	
Intersection Capacity Utilization 108.8%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



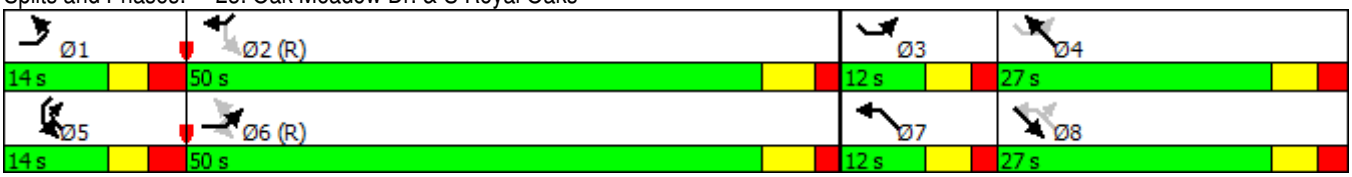
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	35	129	10	71	43	30	229	50	515	73
Future Volume (vph)	87	1120	35	129	10	71	43	30	229	50	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.872				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1570	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.275	0.950		0.723			0.529			0.170		
Satd. Flow (perm)	444	3319	1531	1302	1570	0	985	1925	1583	317	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		97				90		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		1875			721			918		1624		
Travel Time (s)		42.6			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	56	163	17	97	57	52	249	67	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1191	56	163	114	0	57	52	249	67	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	71.4	60.5	60.5	19.4	11.7		19.4	11.7	24.9	71.1	60.4	
Actuated g/C Ratio	0.69	0.59	0.59	0.19	0.11		0.19	0.11	0.24	0.69	0.59	
v/c Ratio	0.32	0.61	0.06	0.58	0.43		0.22	0.24	0.55	0.19	0.47	
Control Delay	7.3	16.5	0.1	43.1	16.8		32.7	43.5	26.1	6.5	11.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.3	16.5	0.1	43.1	16.8		32.7	43.5	26.1	6.5	11.4	
LOS	A	B	A	D	B		C	D	C	A	B	
Approach Delay		14.9			32.3			29.7		11.1		
Approach LOS		B			C			C		B		
90th %ile Green (s)	8.0	52.4	52.4	6.5	12.7		6.5	12.7	7.9	7.9	52.3	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Gap	Gap	Coord	
70th %ile Green (s)	7.7	56.1	56.1	6.5	9.9		6.5	9.9	7.0	7.0	55.4	
70th %ile Term Code	Gap	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
50th %ile Green (s)	7.0	57.3	57.3	6.5	8.7		6.5	8.7	7.0	7.0	57.3	
50th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
30th %ile Green (s)	7.0	58.4	58.4	6.5	7.6		6.5	7.6	7.0	7.0	58.4	
30th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
10th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
Stops (vph)	27	708	0	114	21		32	27	127	16	268	
Fuel Used(gal)	2	24	1	2	1		1	1	4	1	10	
CO Emissions (g/hr)	108	1680	36	165	60		61	50	272	55	720	
NOx Emissions (g/hr)	21	327	7	32	12		12	10	53	11	140	
VOC Emissions (g/hr)	25	389	8	38	14		14	12	63	13	167	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	24	254	0	92	10		30	32	91	12	129	
Queue Length 95th (ft)	35	361	0	126	17		50	42	161	23	149	
Internal Link Dist (ft)		1795			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	421	1950	963	281	433		254	439	462	369	1697	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.31	0.61	0.06	0.58	0.26		0.22	0.12	0.54	0.18	0.47	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 23: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	28	1280	103	6	46	41	33	12	123	277	764	25
Future Volume (vph)	28	1280	103	6	46	41	33	12	123	277	764	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	12	11	12	12	11	12
Grade (%)	1%					-1%	2%				-2%	
Storage Length (ft)		135			100		120	0			220	0
Storage Lanes		3			1		1	1			2	0
Taper Length (ft)					50		50				50	
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95
Frt		0.850	0.850					0.850			0.993	
Flt Protected				0.950	0.950		0.950			0.950	0.954	
Satd. Flow (prot)	1764	2707	1607	1754	1580	0	1787	1489	0	1787	3339	0
Flt Permitted	0.344			0.294	0.950		0.691			0.119	0.954	
Satd. Flow (perm)	607	2707	1607	543	1580	0	1300	1489	0	224	3339	0
Right Turn on Red			Yes						Yes			Yes
Satd. Flow (RTOR)			82					143			82	
Link Speed (mph)	30					30	30				30	
Link Distance (ft)	1624					433	515				792	
Travel Time (s)	36.9					9.8	11.7				18.0	
Peak Hour Factor	0.63	0.92	0.87	0.58	0.68	0.77	0.67	0.63	0.86	0.80	0.99	0.67
Heavy Vehicles (%)	0%	1%	0%	0%	11%	0%	0%	10%	3%	2%	2%	4%
Adj. Flow (vph)	44	1391	118	10	68	53	49	19	143	346	772	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1391	118	10	68	53	49	162	0	346	809	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Left	Left	Right	Right	Left	Left	Right
Median Width(ft)	22					22	12				35	
Link Offset(ft)	0					0	0				0	
Crosswalk Width(ft)	16					16	16				16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	1.04	1.04	0.99	1.01	1.06	1.01	0.99	1.03	0.99
Turning Speed (mph)		9	9	15	15		15	9	9	15	15	9
Number of Detectors	1	1	0	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	42	50	42	42		42	226	
Trailing Detector (ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Position(ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Size(ft)	45	6	50	45	45	50	45	45		45	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	NA	custom	custom	custom	Prot	NA	D.Pm	Prot		pm+pt	Prot	
Protected Phases	1	6			4			8		5	2	
Permitted Phases	6		6	8			4			2		
Detector Phase	1	6		8	4		4	8		5	2	
Switch Phase												

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Minimum Initial (s)	5.0	10.0	10.0	7.0	7.0		7.0	7.0		5.0	10.0	
Minimum Split (s)	17.0	73.0	73.0	50.0	50.0		50.0	50.0		17.0	73.0	
Total Split (s)	17.0	73.0	73.0	50.0	50.0		50.0	50.0		17.0	73.0	
Total Split (%)	12.1%	52.1%	52.1%	35.7%	35.7%		35.7%	35.7%		12.1%	52.1%	
Maximum Green (s)	10.5	67.0	67.0	43.0	43.0		43.0	43.0		10.5	67.0	
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5		3.5	3.5		3.0	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	3.5		3.5	3.5		3.5	2.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-2.5	-2.5		-2.5	-2.5		-1.0	-3.0	
Total Lost Time (s)	5.5	3.0	3.0	4.5	4.5		4.5	4.5		5.5	3.0	
Lead/Lag	Lead	Lag	Lag							Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	None		None	None		None	C-Min	
Walk Time (s)		7.0	7.0	8.0	8.0		8.0	8.0			7.0	
Flash Dont Walk (s)		16.0	16.0	35.0	32.0		32.0	35.0			20.0	
Pedestrian Calls (#/hr)		0	0	0	0		0	0			0	
Act Effct Green (s)	106.2	101.1	101.1	14.4	14.4	0.0	14.4	14.4		114.1	107.4	
Actuated g/C Ratio	0.76	0.72	0.72	0.10	0.10	0.00	0.10	0.10		0.82	0.77	
v/c Ratio	0.08	0.71	0.10	0.18	0.42	no cap	0.37	0.58		1.12	0.31	
Control Delay	3.3	14.3	2.6	63.2	65.8		65.1	20.5		96.3	8.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.3	14.3	2.6	63.2	65.8	Error	65.1	20.5		96.3	8.7	
LOS	A	B	A	E	E	F	E	C		F	A	
Approach Delay	13.1					Err	30.9				34.9	
Approach LOS	B					F	C				C	
90th %ile Green (s)	7.5	93.3	93.3	16.7	16.7		16.7	16.7		10.5	96.3	
90th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
70th %ile Green (s)	6.9	96.2	96.2	13.8	13.8		13.8	13.8		10.5	99.8	
70th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
50th %ile Green (s)	6.6	98.1	98.1	11.9	11.9		11.9	11.9		10.5	102.0	
50th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
30th %ile Green (s)	6.3	100.0	100.0	10.0	10.0		10.0	10.0		10.5	104.2	
30th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
10th %ile Green (s)	0.0	102.8	102.8	7.2	7.2		7.2	7.2		10.5	119.8	
10th %ile Term Code	Skip	Coord	Coord	Hold	Hold		Hold	Hold		Max	Coord	
Stops (vph)	6	714	11	7	41	0	30	28		165	524	
Fuel Used(gal)	0	24	1	0	1	0	1	1		8	9	
CO Emissions (g/hr)	28	1668	99	10	70	10	51	88		563	641	
NOx Emissions (g/hr)	6	325	19	2	14	2	10	17		110	125	
VOC Emissions (g/hr)	7	387	23	2	16	2	12	20		130	148	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0		0	0	
Queue Length 50th (ft)	6	372	8	8	59	0	42	16		~186	175	
Queue Length 95th (ft)	10	525	28	17	79	0	61	21		m#233	m339	
Internal Link Dist (ft)	1544					353	435				712	
Turn Bay Length (ft)		135	135	100	100		120			220	220	
Base Capacity (vph)	572	1954	1182	176	513	1	422	580		310	2580	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Reduced v/c Ratio	0.08	0.71	0.10	0.06	0.13	53.00	0.12	0.28		1.12	0.31	

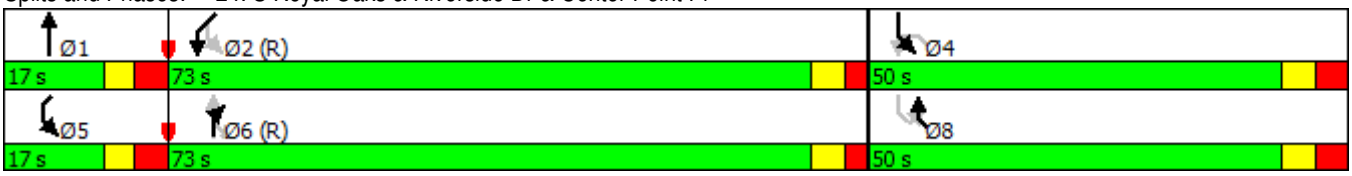
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SWL and 6:NBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: Err			
Intersection Signal Delay: Err		Intersection LOS: F	
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

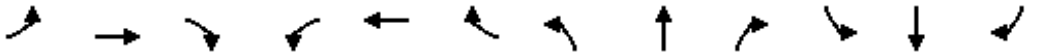
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

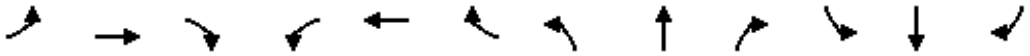
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: S Royal Oaks & Riverside Dr & Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	985	1174	269	141	371	1002	316	469	178
Future Volume (vph)	206	1108	63	985	1174	269	141	371	1002	316	469	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					43	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		350			691			792			964	
Travel Time (s)		6.0			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1132	1290	302	191	447	1126	381	494	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1132	1290	302	191	447	1126	381	717	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

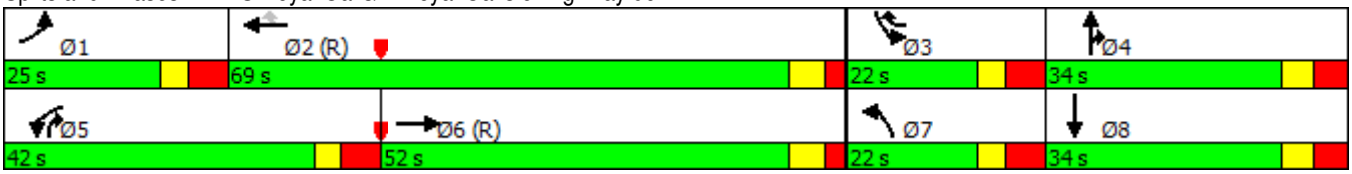


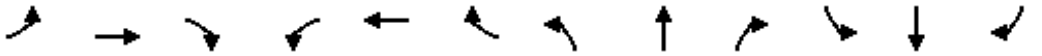
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.37	0.81	0.30	0.55	0.61	0.82	1.02	0.99	
Control Delay	68.2	51.1		205.9	49.2	16.7	56.0	47.5	54.4	117.0	86.1	
Queue Delay	0.0	0.3		0.3	0.0	0.0	0.0	0.0	0.2	0.0	0.6	
Total Delay	68.2	51.4		206.1	49.2	16.7	56.0	47.5	54.6	117.0	86.7	
LOS	E	D		F	D	B	E	D	D	F	F	
Approach Delay		53.9			110.8			53.0			97.2	
Approach LOS		D			F			D			F	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	16.7	45.5		34.5	63.3	14.5	14.5	26.5		14.5	26.5	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)	15.1	45.5		34.5	64.9	14.5	13.5	26.5		14.5	27.5	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	13.4	45.5		34.5	66.6	14.5	12.0	26.5		14.5	29.0	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	11.1	45.5		34.5	68.9	14.5	9.8	26.5		14.5	31.2	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	189	1046		761	1064	208	128	336	976	280	542	
Fuel Used(gal)	5	25		57	32	5	3	8	23	11	19	
CO Emissions (g/hr)	364	1765		3965	2216	359	223	541	1585	800	1343	
NOx Emissions (g/hr)	71	343		771	431	70	43	105	308	156	261	
VOC Emissions (g/hr)	84	409		919	514	83	52	125	367	185	311	
Dilemma Vehicles (#)	0	39		0	45	0	0	0	0	0	0	
Queue Length 50th (ft)	108	415		~771	582	140	86	215	651	~203	~360	
Queue Length 95th (ft)	151	475		m#573	m517	m125	m100	m252	m717	#272	#512	
Internal Link Dist (ft)		270			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	724	
Starvation Cap Reductn	0	0		0	0	0	0	0	24	0	0	
Spillback Cap Reductn	0	48		40	0	0	0	0	0	0	2	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.83		1.44	0.81	0.30	0.50	0.61	0.84	1.02	0.99	

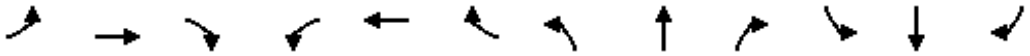
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.37			
Intersection Signal Delay: 82.3		Intersection LOS: F	
Intersection Capacity Utilization 90.4%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 7: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2005	488	285	928	0	0	0	0	914	0	1455
Future Volume (vph)	0	2005	488	285	928	0	0	0	0	914	0	1455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			399									134
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2156	626	401	1079	0	0	0	0	1051	0	1653
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2156	626	401	1079	0	0	0	0	1051	0	1653
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.99	0.78	1.35	0.58					0.77		1.43
Control Delay		72.5	30.8	226.2	26.7					43.9		231.7
Queue Delay		1.3	0.0	0.0	0.9					1.8		0.0
Total Delay		73.8	30.8	226.2	27.6					45.7		231.7
LOS		E	C	F	C					D		F
Approach Delay		64.1			81.4							
Approach LOS		E			F							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1879	525	223	503					776		1000
Fuel Used(gal)		64	12	16	13					18		83
CO Emissions (g/hr)		4492	850	1146	943					1262		5836
NOx Emissions (g/hr)		874	165	223	184					246		1135
VOC Emissions (g/hr)		1041	197	266	219					292		1353
Dilemma Vehicles (#)		105	0	0	52					0		0
Queue Length 50th (ft)		639	325	~525	290					457		~1200
Queue Length 95th (ft)		m#695	m294	#521	433					515		#1305
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	801	297	1865					1368		1154
Starvation Cap Reductn		0	0	0	466					0		0
Spillback Cap Reductn		14	0	0	0					172		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		1.00	0.78	1.35	0.77					0.88		1.43

Intersection Summary

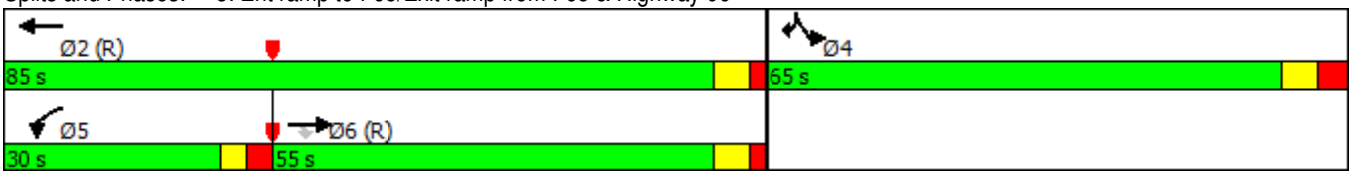
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 104.8		Intersection LOS: F	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			

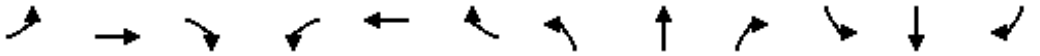
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

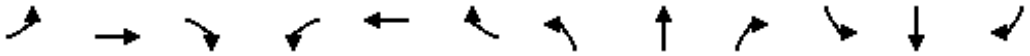
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	622	2297	0	0	897	998	316	0	164	0	0	0
Future Volume (vph)	622	2297	0	0	897	998	316	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						223			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	641	2344	0	0	986	1073	343	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	641	2344	0	0	986	1073	343	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

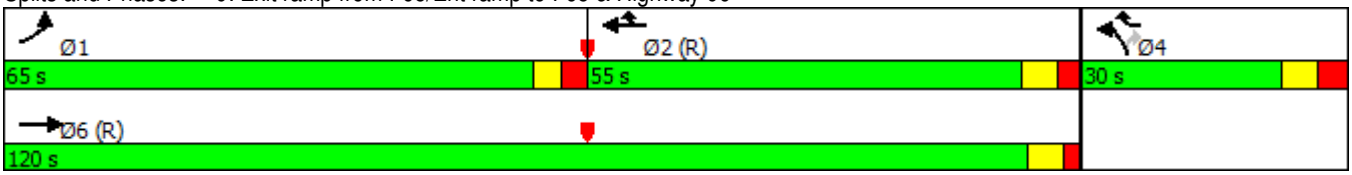


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	37.4	114.6			70.7	102.1	21.9		21.9			
Actuated g/C Ratio	0.25	0.76			0.47	0.68	0.15		0.15			
v/c Ratio	0.79	0.91			0.59	0.55	0.71		0.65			
Control Delay	79.6	23.9			32.0	11.0	70.0		48.9			
Queue Delay	0.0	5.5			0.0	0.0	0.0		0.0			
Total Delay	79.6	29.4			32.0	11.0	70.0		48.9			
LOS	E	C			C	B	E		D			
Approach Delay		40.2			21.0							
Approach LOS		D			C							
90th %ile Green (s)	45.4	114.0			62.1		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	41.1	114.0			66.4		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	37.3	114.0			70.2		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	34.3	114.0			73.2		22.5		22.5			
30th %ile Term Code	Gap	Coord			Coord		Max		Max			
10th %ile Green (s)	29.0	117.2			81.7		19.3		19.3			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	611	1844			649	398	298		100			
Fuel Used(gal)	18	38			23	19	7		3			
CO Emissions (g/hr)	1288	2653			1639	1303	524		208			
NOx Emissions (g/hr)	251	516			319	253	102		40			
VOC Emissions (g/hr)	299	615			380	302	121		48			
Dilemma Vehicles (#)	0	83			30	0	0		0			
Queue Length 50th (ft)	344	588			368	219	166		112			
Queue Length 95th (ft)	m343	m495			487	330	222		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2575			1668	1978	495		298			
Starvation Cap Reductn	0	200			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.50	0.99			0.59	0.54	0.69		0.63			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 35.2		Intersection LOS: D	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 9: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	41	147	55	118	104	36	123	196	765	145
Future Volume (vph)	92	827	41	147	55	118	104	36	123	196	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.905				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1630	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.084	0.950		0.715			0.286			0.253		
Satd. Flow (perm)	136	3319	1531	1287	1630	0	533	1925	1583	471	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		69				134		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	65	186	95	162	139	62	134	261	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	880	65	186	257	0	139	62	134	261	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	74.7	61.6	61.6	34.5	22.7		33.9	21.7	36.6	71.3	59.8	
Actuated g/C Ratio	0.62	0.51	0.51	0.29	0.19		0.28	0.18	0.30	0.59	0.50	
v/c Ratio	0.60	0.52	0.08	0.44	0.71		0.53	0.18	0.23	0.67	0.85	
Control Delay	28.5	21.8	0.2	34.8	43.0		37.5	39.6	5.3	21.2	31.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	28.5	21.8	0.2	34.8	43.0		37.5	39.6	5.3	21.2	31.4	
LOS	C	C	A	C	D		D	D	A	C	C	
Approach Delay		21.3			39.5			25.0		29.6		
Approach LOS		C			D			C		C		
90th %ile Green (s)	12.0	51.5	51.5	8.5	28.5		8.5	28.5	8.0	8.0	47.5	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	56.3	56.3	8.5	23.7		8.5	23.7	8.0	8.0	52.3	
70th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	10.3	59.8	59.8	8.5	20.2		8.5	20.2	8.0	8.0	57.5	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
30th %ile Green (s)	7.7	63.2	63.2	8.5	16.8		8.5	16.8	8.0	8.0	63.5	
30th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
10th %ile Green (s)	7.0	69.9	69.9	24.8	11.7		7.1	0.0	7.8	7.8	70.7	
10th %ile Term Code	Min	Coord	Coord	Hold	Gap		Gap	Skip	Gap	Gap	Coord	
Stops (vph)	47	538	0	113	117		76	28	14	91	657	
Fuel Used(gal)	1	10	0	2	3		2	1	1	4	21	
CO Emissions (g/hr)	83	713	12	166	211		153	55	72	268	1466	
NOx Emissions (g/hr)	16	139	2	32	41		30	11	14	52	285	
VOC Emissions (g/hr)	19	165	3	39	49		35	13	17	62	340	
Dilemma Vehicles (#)	0	0	0	0	0		0	2	0	0	0	
Queue Length 50th (ft)	41	226	0	111	138		80	41	0	80	421	
Queue Length 95th (ft)	69	327	0	135	107		98	46	40	118	446	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	255	1704	850	420	478		265	505	577	393	1455	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.54	0.52	0.08	0.44	0.54		0.52	0.12	0.23	0.66	0.85	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 27.8	Intersection LOS: C
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 23: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	90	1107	27	83	64	123	46	58	302	269	1133	93
Future Volume (vph)	90	1107	27	83	64	123	46	58	302	269	1133	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	12	11	12	12	11	12
Grade (%)	1%					-1%	2%				-2%	
Storage Length (ft)		135			100		120	0			220	0
Storage Lanes		3			1		1	1			2	0
Taper Length (ft)					50		50				50	
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95
Frt		0.850	0.850					0.850			0.987	
Flt Protected				0.950	0.950		0.950			0.950	0.956	
Satd. Flow (prot)	1764	2707	1575	1736	1754	0	1752	1546	0	1805	3365	0
Flt Permitted	0.144			0.167	0.950		0.673			0.093	0.956	
Satd. Flow (perm)	254	2707	1575	305	1754	0	1241	1546	0	177	3365	0
Right Turn on Red			Yes						Yes			Yes
Satd. Flow (RTOR)			124					166			76	
Link Speed (mph)	30					30	30				30	
Link Distance (ft)	1624					433	515				792	
Travel Time (s)	36.9					9.8	11.7				18.0	
Peak Hour Factor	0.79	0.95	0.64	0.86	0.71	0.82	0.75	0.88	0.94	0.75	0.90	0.76
Heavy Vehicles (%)	0%	1%	2%	1%	0%	0%	2%	0%	0%	1%	1%	0%
Adj. Flow (vph)	114	1165	42	97	90	150	61	66	321	359	1259	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1165	42	97	90	150	61	387	0	359	1381	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Left	Left	Right	Right	Left	Left	Right
Median Width(ft)	22					22	12				35	
Link Offset(ft)	0					0	0				0	
Crosswalk Width(ft)	16					16	16				16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	1.04	1.04	0.99	1.01	1.06	1.01	0.99	1.03	0.99
Turning Speed (mph)		9	9	15	15		15	9	9	15	15	9
Number of Detectors	1	1	0	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	42	50	42	42		42	226	
Trailing Detector (ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Position(ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Size(ft)	45	6	50	45	45	50	45	45		45	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	NA	custom	custom	custom	Prot	NA	D.Pm	Prot		pm+pt	Prot	
Protected Phases	1	6			4	2!		8		5	2!	
Permitted Phases	6		6	8			4			2		
Detector Phase	1	6		8	4	2	4	8		5	2	
Switch Phase												

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Minimum Initial (s)	5.0	10.0	10.0	7.0	7.0	10.0	7.0	7.0		5.0	10.0	
Minimum Split (s)	15.0	70.0	70.0	50.0	50.0	85.0	50.0	50.0		30.0	85.0	
Total Split (s)	14.0	72.0	72.0	49.0	49.0	87.0	49.0	49.0		29.0	87.0	
Total Split (%)	9.3%	48.0%	48.0%	32.7%	32.7%	58.0%	32.7%	32.7%		19.3%	58.0%	
Maximum Green (s)	7.5	66.0	66.0	42.0	42.0	81.0	42.0	42.0		22.5	81.0	
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.0	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	3.5	2.5	3.5	3.5		3.5	2.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-2.5	-2.5		-2.5	-2.5		-1.0	-3.0	
Total Lost Time (s)	5.5	3.0	3.0	4.5	4.5		4.5	4.5		5.5	3.0	
Lead/Lag	Lead	Lag	Lag			Lag				Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	None	C-Min	None	None		None	C-Min	
Walk Time (s)		7.0	7.0	8.0	8.0	7.0	8.0	8.0			7.0	
Flash Dont Walk (s)		16.0	16.0	35.0	32.0	20.0	32.0	35.0			20.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0			0	
Act Effct Green (s)	81.3	75.4	75.4	38.1	38.1	0.0	38.1	38.1		101.9	90.6	
Actuated g/C Ratio	0.54	0.50	0.50	0.25	0.25	0.00	0.25	0.25		0.68	0.60	
v/c Ratio	0.52	0.86	0.05	1.26	0.20	no cap	0.19	0.75		0.96	0.67	
Control Delay	21.2	41.5	0.1	231.8	42.9		42.8	37.4		56.3	15.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	2.2	
Total Delay	21.2	41.5	0.1	231.8	42.9	Error	42.8	37.4		56.3	18.0	
LOS	C	D	A	F	D	F	D	D		E	B	
Approach Delay	38.4					Err	38.2				25.9	
Approach LOS	D					F	D				C	
90th %ile Green (s)	7.5	66.0	66.0	42.0	42.0	81.0	42.0	42.0		22.5	81.0	
90th %ile Term Code	Max	Coord	Coord	Max	Hold	Coord	Hold	Max		Max	Coord	
70th %ile Green (s)	7.5	66.0	66.0	42.0	42.0	81.0	42.0	42.0		22.5	81.0	
70th %ile Term Code	Max	Coord	Coord	Max	Hold	Coord	Hold	Max		Max	Coord	
50th %ile Green (s)	7.5	67.2	67.2	40.8	40.8	82.2	40.8	40.8		22.5	82.2	
50th %ile Term Code	Max	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Max	Coord	
30th %ile Green (s)	7.5	75.2	75.2	32.8	32.8	90.2	32.8	32.8		22.5	90.2	
30th %ile Term Code	Max	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Max	Coord	
10th %ile Green (s)	6.8	87.8	87.8	20.2	20.2	103.5	20.2	20.2		22.5	103.5	
10th %ile Term Code	Gap	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Max	Coord	
Stops (vph)	43	918	0	68	48	0	35	198		270	996	
Fuel Used(gal)	2	28	0	5	1	0	1	5		6	17	
CO Emissions (g/hr)	123	1988	24	320	73	29	54	369		436	1189	
NOx Emissions (g/hr)	24	387	5	62	14	6	11	72		85	231	
VOC Emissions (g/hr)	29	461	6	74	17	7	13	86		101	276	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0		0	0	
Queue Length 50th (ft)	40	595	0	~108	66	0	45	197		234	692	
Queue Length 95th (ft)	58	#776	0	#215	88	0	70	305		m165	m562	
Internal Link Dist (ft)	1544					353	435				712	
Turn Bay Length (ft)		135	135	100	100		120			220	220	
Base Capacity (vph)	223	1361	853	90	520	1	368	575		375	2062	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	514	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Reduced v/c Ratio	0.51	0.86	0.05	1.08	0.17	150.00	0.17	0.67		0.96	0.89	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 123 (82%), Referenced to phase 2:SBSW and 6:NBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: Err			
Intersection Signal Delay: Err		Intersection LOS: F	
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

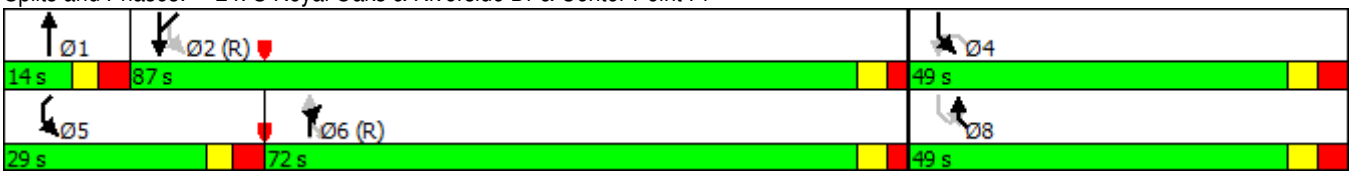
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 24: S Royal Oaks & Riverside Dr & Center Point Pl



HCS 2010 Two-Way Stop Control Summary Report

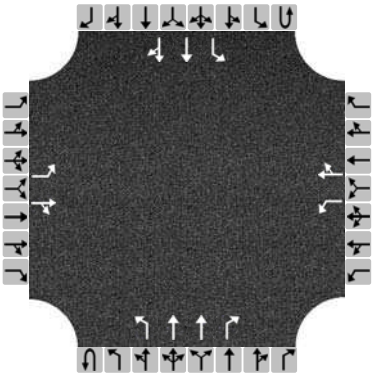
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	1	9		14	0	40		10	1447	25		64	659	51
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		10		14		41		10				66		
Capacity		148		394		100		361		882				446		
v/c Ratio		0.18		0.03		0.14		0.11		0.01				0.15		
95% Queue Length		0.6		0.1		0.5		0.4		0.0				0.5		
Control Delay (s/veh)		34.8		14.4		47.0		16.3		9.1				14.5		
Level of Service (LOS)		D		B		E		C		A				B		
Approach Delay (s/veh)	29.3				24.1				0.1				1.2			
Approach LOS	D				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

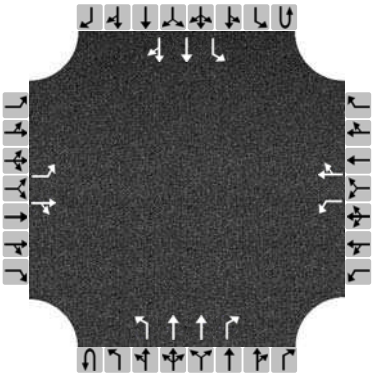
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	3	16		21	4	52		6	1016	17		45	1023	105
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		20		22		58		6				47		
Capacity		130		330		157		418		602				656		
v/c Ratio		0.21		0.06		0.14		0.14		0.01				0.07		
95% Queue Length		0.7		0.2		0.5		0.5		0.0				0.2		
Control Delay (s/veh)		39.7		16.6		31.6		15.0		11.0				10.9		
Level of Service (LOS)		E		C		D		C		B				B		
Approach Delay (s/veh)	29.9				19.6				0.1				0.4			
Approach LOS	D				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

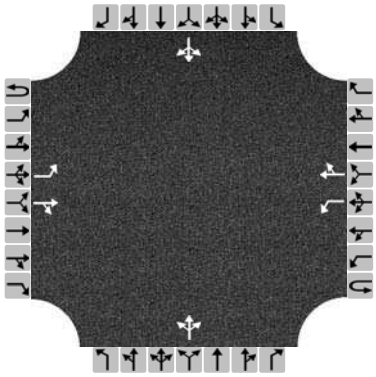
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		24	64	7		0	266	0		27	6	0		1	2	9
Percent Heavy Vehicles		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		30									42				14	
Capacity		1239				1519					665				814	
v/c Ratio		0.02									0.06				0.02	
95% Queue Length		0.1									0.2				0.1	
Control Delay (s/veh)		8.0				7.4					10.8				9.5	
Level of Service (LOS)		A				A					B				A	
Approach Delay (s/veh)	2.0								10.8				9.5			
Approach LOS	A								B				A			

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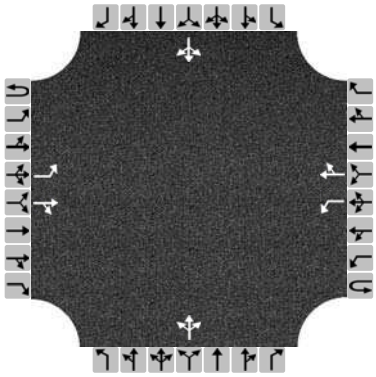
HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	FTG	Intersection	Oak Meadow Dr and dwy
Agency/Co.	FTG	Jurisdiction	Franklin, TN
Date Performed	Mar 2016	East/West Street	Oak Meadow Drive
Analysis Year	2016	North/South Street	Western Home Depot dwy
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.80
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	10728 (Total)		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		24	241	27		0	215	2		15	3	0		16	5	33
Percent Heavy Vehicles		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		30									23				67	
Capacity		1304				1236					543				707	
v/c Ratio		0.02									0.04				0.09	
95% Queue Length		0.1									0.1				0.3	
Control Delay (s/veh)		7.8				7.9					11.9				10.6	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.6								11.9				10.6			
Approach LOS	A								B				B			

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HCS 2010 Two-Way Stop Control Summary Report

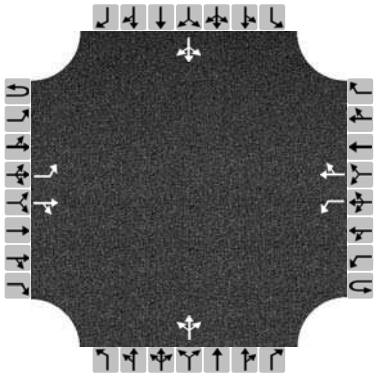
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Eastern Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		13	49	3		0	198	0		14	0	0		0	0	54
Percent Heavy Vehicles		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		16									18				68	
Capacity		1330				1550					567				796	
v/c Ratio		0.01									0.03				0.09	
95% Queue Length		0.0									0.1				0.3	
Control Delay (s/veh)		7.7				7.3					11.6				9.9	
Level of Service (LOS)		A				A					B				A	
Approach Delay (s/veh)	1.5								11.6				9.9			
Approach LOS	A								B				A			

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HCS 2010 Two-Way Stop Control Summary Report

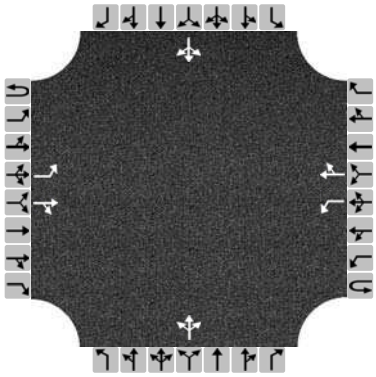
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Eastern Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		53	190	14		0	181	0		7	0	0		0	0	29
Percent Heavy Vehicles		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		66									9				36	
Capacity		1355				1321					460				819	
v/c Ratio		0.05									0.02				0.04	
95% Queue Length		0.2									0.1				0.1	
Control Delay (s/veh)		7.8				7.7					13.0				9.6	
Level of Service (LOS)		A				A					B				A	
Approach Delay (s/veh)	1.6								13.0				9.6			
Approach LOS	A								B				A			

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HCS 2010 Two-Way Stop Control Summary Report

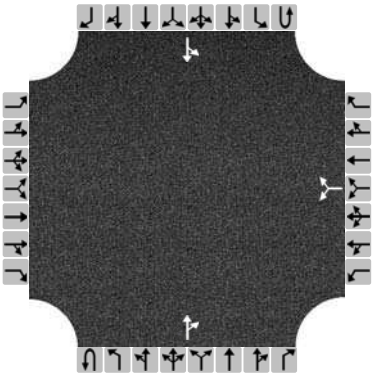
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	Home Depot dwy and projec
Jurisdiction	Franklin, TN
East/West Street	Project Access
North/South Street	Eastern Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						54		44			0	13		11	0	
Percent Heavy Vehicles						0		0						0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							123							14		
Capacity							1018							1615		
v/c Ratio							0.12							0.01		
95% Queue Length							0.4							0.0		
Control Delay (s/veh)							9.0							7.2		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					9.0								7.2			
Approach LOS					A								A			

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HCS 2010 Two-Way Stop Control Summary Report

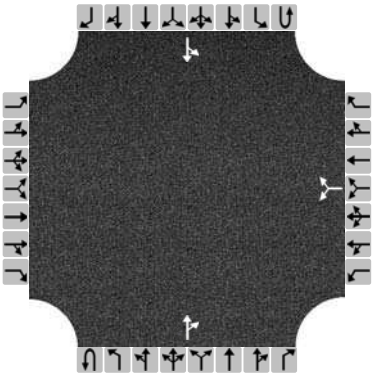
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	Home Depot dwy and projec
Jurisdiction	Franklin, TN
East/West Street	Project Access
North/South Street	Eastern Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						29		23			0	53		44	0	
Percent Heavy Vehicles						0		0						0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							65							55		
Capacity							910							1549		
v/c Ratio							0.07							0.04		
95% Queue Length							0.2							0.1		
Control Delay (s/veh)							9.3							7.4		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					9.3								7.4			
Approach LOS					A								A			

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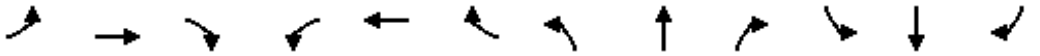
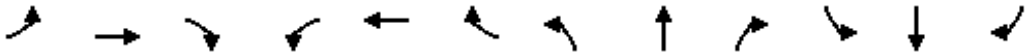
TOTAL PROJECTED CONDITIONS
With a third northbound through lane



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	849	993	281	99	276	1060	225	211	82
Future Volume (vph)	112	772	60	849	993	281	99	276	1060	225	211	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		9				127					29	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		350			691			792			964	
Travel Time (s)		6.0			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	913	1091	319	121	345	1140	245	285	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	913	1091	319	121	345	1140	245	386	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

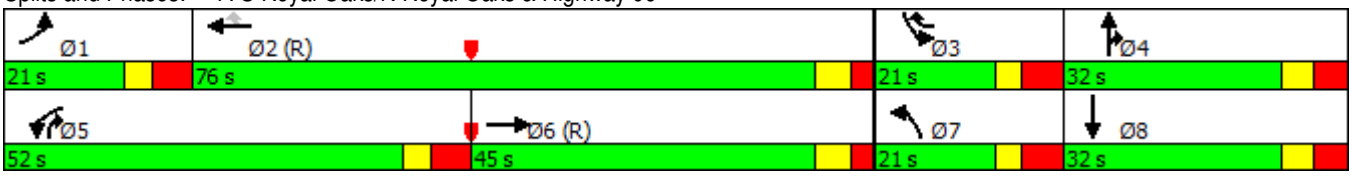


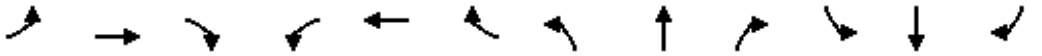
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	45.0		52.0	76.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	14.0%	30.0%		34.7%	50.7%	14.0%	14.0%	21.3%		14.0%	21.3%	
Maximum Green (s)	13.5	38.5		44.5	69.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.8	41.4		46.9	74.5	93.7	12.7	27.5	78.9	15.2	30.0	
Actuated g/C Ratio	0.09	0.28		0.31	0.50	0.62	0.08	0.18	0.53	0.10	0.20	
v/c Ratio	0.45	0.72		0.89	0.65	0.30	0.43	0.52	0.76	0.73	0.58	
Control Delay	68.7	52.3		56.2	30.7	9.4	69.5	58.4	32.0	78.8	54.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	
Total Delay	68.7	52.3		56.2	30.7	9.4	69.5	58.4	32.5	78.8	54.2	
LOS	E	D		E	C	A	E	E	C	E	D	
Approach Delay		54.5			37.8			40.9			63.8	
Approach LOS		D			D			D			E	
Queue Length 50th (ft)	68	302		444	445	89	58	162	485	121	167	
Queue Length 95th (ft)	91	356		m483	m488	m123	83	189	586	170	181	
Internal Link Dist (ft)		270			611			712			884	
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	362	1299		1029	1690	1062	346	667	1508	342	671	
Starvation Cap Reductn	0	0		0	0	0	0	0	95	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.39	0.72		0.89	0.65	0.30	0.35	0.52	0.81	0.72	0.58	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 44 (29%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 44.8		Intersection LOS: D	

Intersection Capacity Utilization 71.8% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: S Royal Oaks/N Royal Oaks & Highway 96





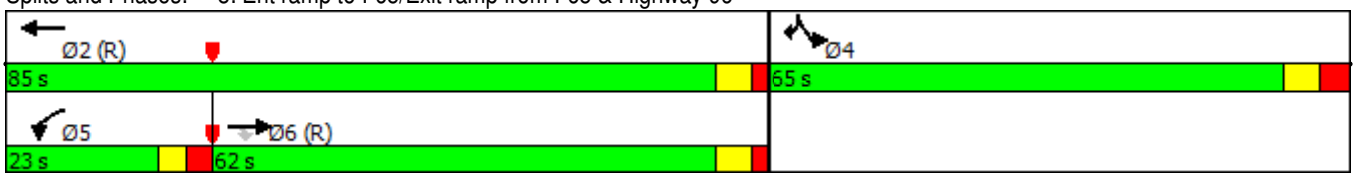
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1793	194	111	1060	0	0	0	0	355	0	1039
Future Volume (vph)	0	1793	194	111	1060	0	0	0	0	355	0	1039
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			162									93
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1970	216	129	1218	0	0	0	0	418	0	1105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1970	216	129	1218	0	0	0	0	418	0	1105
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												

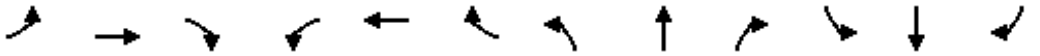
Lanes, Volumes, Timings
8: Ent ramp to I-65/Exit ramp from I-65 & Highway 96 3/31/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					65.0		65.0
Total Split (%)		41.3%	41.3%	15.3%	56.7%					43.3%		43.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.1	60.1	15.9	81.0					59.5		59.5
Actuated g/C Ratio		0.40	0.40	0.11	0.54					0.40		0.40
v/c Ratio		0.77	0.31	0.69	0.67					0.32		1.00
Control Delay		34.8	8.3	87.9	4.6					32.1		67.4
Queue Delay		7.6	0.0	0.0	0.6					0.1		0.0
Total Delay		42.4	8.3	87.9	5.2					32.3		67.4
LOS		D	A	F	A					C		E
Approach Delay		39.0			13.1							
Approach LOS		D			B							
Queue Length 50th (ft)		386	37	97	24					144		575
Queue Length 95th (ft)		461	m80	m138	m24					176		#754
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2544	702	214	1829					1303		1108
Starvation Cap Reductn		0	0	0	262					0		0
Spillback Cap Reductn		547	0	0	0					250		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.99	0.31	0.60	0.78					0.40		1.00

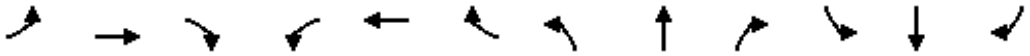
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 32 (21%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 37.8		Intersection LOS: D	
Intersection Capacity Utilization 108.8%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





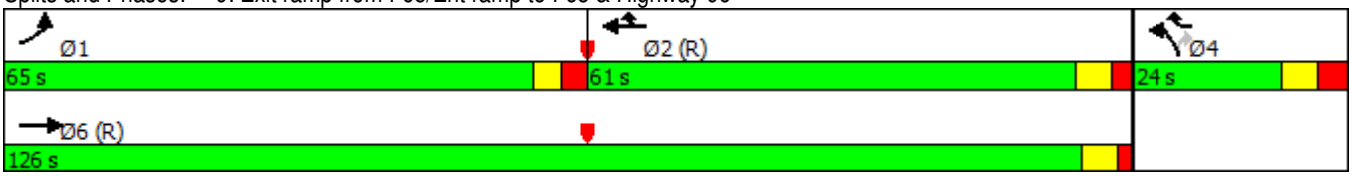
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1386	762	0	0	762	1217	409	0	364	0	0	0
Future Volume (vph)	1386	762	0	0	762	1217	409	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						22			258			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1575	886	0	0	802	1242	431	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1575	886	0	0	802	1242	431	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	65.0	126.0			61.0		24.0		24.0			
Total Split (%)	43.3%	84.0%			40.7%		16.0%		16.0%			
Maximum Green (s)	59.0	120.0			54.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	59.0	120.0			54.5	80.5	16.5		16.5			
Actuated g/C Ratio	0.39	0.80			0.36	0.54	0.11		0.11			
v/c Ratio	1.21	0.33			0.62	0.82	1.19		0.97			
Control Delay	140.5	12.3			41.9	33.7	163.6		60.3			
Queue Delay	0.8	0.7			0.0	0.0	0.0		0.0			
Total Delay	141.3	13.0			41.9	33.7	163.6		60.3			
LOS	F	B			D	C	F		E			
Approach Delay		95.1			36.9							
Approach LOS		F			D							
Queue Length 50th (ft)	~990	273			339	546	~260		147			
Queue Length 95th (ft)	#1090	333			411	660	#372		#363			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1298	2645			1285	1520	363		408			
Starvation Cap Reductn	229	1319			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.47	0.67			0.62	0.82	1.19		0.97			

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.21			
Intersection Signal Delay: 75.7		Intersection LOS: E	
Intersection Capacity Utilization 108.8%		ICU Level of Service G	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 9: Exit ramp from I-65/Ent ramp to I-65 & Highway 96

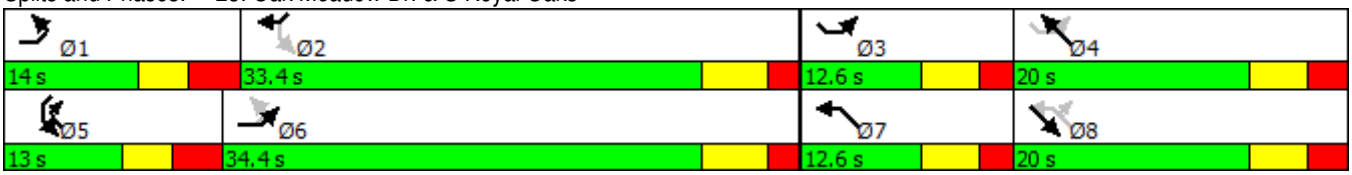


Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	35	129	10	71	43	30	229	50	515	73
Future Volume (vph)	87	1120	35	129	10	71	43	30	229	50	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.94	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt		0.993			0.872				0.850		0.850	
Flt Protected	0.950	0.954		0.950			0.950			0.950		
Satd. Flow (prot)	1534	4810	0	1711	1570	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.249	0.954		0.723			0.652			0.147		
Satd. Flow (perm)	402	4810	0	1302	1570	0	1215	1925	1583	274	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		198			97				118		198	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		1875			721			918		1624		
Travel Time (s)		42.6			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	56	163	17	97	57	52	249	67	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1247	0	163	114	0	57	52	249	67	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		41			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42		42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45		45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot		D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6			4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0		7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0		12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	34.4		12.6	20.0		12.6	20.0	13.0	13.0	33.4	
Total Split (%)	17.5%	43.0%		15.8%	25.0%		15.8%	25.0%	16.3%	16.3%	41.8%	
Maximum Green (s)	8.0	28.4		7.1	14.0		7.1	14.0	7.0	7.0	27.4	
Yellow Time (s)	3.0	4.0		3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0		2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5		-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5		3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0		1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	Min		None	None		None	None	None	None	Min	
Act Effct Green (s)	38.7	27.6		16.6	11.1		16.6	11.1	21.1	39.0	30.6	
Actuated g/C Ratio	0.58	0.41		0.25	0.17		0.25	0.17	0.32	0.58	0.46	
v/c Ratio	0.32	0.59		0.43	0.33		0.15	0.16	0.43	0.18	0.57	
Control Delay	9.1	14.8		22.9	12.0		18.7	28.3	12.4	7.9	14.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	9.1	14.8		22.9	12.0		18.7	28.3	12.4	7.9	14.1	
LOS	A	B		C	B		B	C	B	A	B	
Approach Delay		14.3			18.4			15.7		13.6		
Approach LOS		B			B			B		B		
Queue Length 50th (ft)	24	128		56	7		18	21	44	12	118	
Queue Length 95th (ft)	37	185		87	16		35	32	102	25	145	
Internal Link Dist (ft)		1795			641			838		1544		
Turn Bay Length (ft)	70	70		75			100		195	180		
Base Capacity (vph)	420	2322		384	471		384	489	581	378	1415	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.31	0.54		0.42	0.24		0.15	0.11	0.43	0.18	0.56	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 66.8			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 14.7		Intersection LOS: B	
Intersection Capacity Utilization 52.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	28	1280	103	6	46	41	33	12	123	277	764	25
Future Volume (vph)	28	1280	103	6	46	41	33	12	123	277	764	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	12	11	12	12	11	12
Grade (%)	1%					-1%	2%				-2%	
Storage Length (ft)		135			100		120	0			220	0
Storage Lanes		3			1		1	1			2	0
Taper Length (ft)					50		50				50	
Lane Util. Factor	1.00	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95
Frt		0.850						0.850			0.993	
Flt Protected				0.950	0.950		0.950			0.950	0.954	
Satd. Flow (prot)	1764	3509	0	1754	1580	0	1787	1489	0	1787	3339	0
Flt Permitted	0.344			0.294	0.950		0.691			0.089	0.954	
Satd. Flow (perm)	607	3509	0	543	1580	0	1300	1489	0	167	3339	0
Right Turn on Red			Yes						Yes			Yes
Satd. Flow (RTOR)		82						143			82	
Link Speed (mph)	30					30	30				30	
Link Distance (ft)	1624					433	515				792	
Travel Time (s)	36.9					9.8	11.7				18.0	
Peak Hour Factor	0.63	0.92	0.87	0.58	0.68	0.77	0.67	0.63	0.86	0.80	0.99	0.67
Heavy Vehicles (%)	0%	1%	0%	0%	11%	0%	0%	10%	3%	2%	2%	4%
Adj. Flow (vph)	44	1391	118	10	68	53	49	19	143	346	772	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1509	0	10	68	53	49	162	0	346	809	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Left	Left	Right	Right	Left	Left	Right
Median Width(ft)	22					22	12				35	
Link Offset(ft)	0					0	0				0	
Crosswalk Width(ft)	16					16	16				16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	1.04	1.04	0.99	1.01	1.06	1.01	0.99	1.03	0.99
Turning Speed (mph)		9	9	15	15		15	9	9	15	15	9
Number of Detectors	1	1		1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226		42	42	50	42	42		42	226	
Trailing Detector (ft)	-3	220		-3	-3	0	-3	-3		-3	220	
Detector 1 Position(ft)	-3	220		-3	-3	0	-3	-3		-3	220	
Detector 1 Size(ft)	45	6		45	45	50	45	45		45	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	NA	custom		custom	Prot	NA	D.Pm	Prot		pm+pt	Prot	
Protected Phases	1	6			4			8		5	2	
Permitted Phases	6			8			4			2		
Detector Phase	1	6		8	4		4	8		5	2	
Switch Phase												

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Minimum Initial (s)	5.0	10.0		7.0	7.0		7.0	7.0		5.0	10.0	
Minimum Split (s)	17.0	73.0		50.0	50.0		50.0	50.0		17.0	73.0	
Total Split (s)	17.0	73.0		50.0	50.0		50.0	50.0		17.0	73.0	
Total Split (%)	12.1%	52.1%		35.7%	35.7%		35.7%	35.7%		12.1%	52.1%	
Maximum Green (s)	10.5	67.0		43.0	43.0		43.0	43.0		10.5	67.0	
Yellow Time (s)	3.0	3.5		3.5	3.5		3.5	3.5		3.0	3.5	
All-Red Time (s)	3.5	2.5		3.5	3.5		3.5	3.5		3.5	2.5	
Lost Time Adjust (s)	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5		-1.0	-3.0	
Total Lost Time (s)	5.5	3.0		4.5	4.5		4.5	4.5		5.5	3.0	
Lead/Lag	Lead	Lag								Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min		None	None		None	None		None	C-Min	
Walk Time (s)		7.0		8.0	8.0		8.0	8.0			7.0	
Flash Dont Walk (s)		16.0		35.0	32.0		32.0	35.0			20.0	
Pedestrian Calls (#/hr)		0		0	0		0	0			0	
Act Effct Green (s)	106.2	101.1		14.4	14.4	0.0	14.4	14.4		114.1	107.4	
Actuated g/C Ratio	0.76	0.72		0.10	0.10	0.00	0.10	0.10		0.82	0.77	
v/c Ratio	0.08	0.59		0.18	0.42	no cap	0.37	0.58		1.29	0.31	
Control Delay	3.3	10.3		63.2	65.8		65.1	20.5		181.0	5.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.3	10.3		63.2	65.8	Error	65.1	20.5		181.0	5.4	
LOS	A	B		E	E	F	E	C		F	A	
Approach Delay	10.1					Err	30.9				58.0	
Approach LOS	B					F	C				E	
Queue Length 50th (ft)	6	248		8	59	0	42	16		~283	97	
Queue Length 95th (ft)	10	337		17	79	0	61	21		#402	146	
Internal Link Dist (ft)	1544					353	435				712	
Turn Bay Length (ft)		135		100	100		120			220	220	
Base Capacity (vph)	572	2556		176	513	1	422	580		269	2580	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.08	0.59		0.06	0.13	53.00	0.12	0.28		1.29	0.31	

Intersection Summary

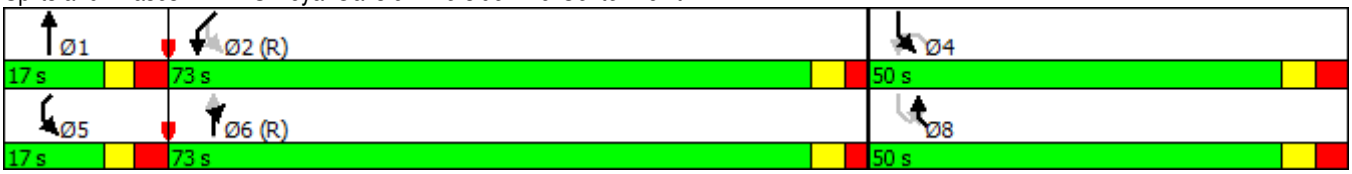
Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 139 (99%), Referenced to phase 2:SWL and 6:NBT, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: Err
Intersection Signal Delay: Err Intersection LOS: F
Intersection Capacity Utilization Err% ICU Level of Service H
Analysis Period (min) 15

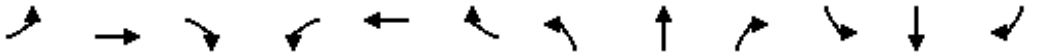
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

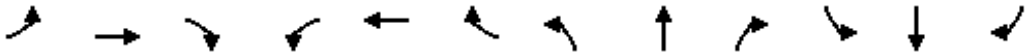
Queue shown is maximum after two cycles.

Splits and Phases: 24: S Royal Oaks & Riverside Dr & Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	985	1174	269	141	371	1002	316	469	178
Future Volume (vph)	206	1108	63	985	1174	269	141	371	1002	316	469	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					43	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		350			691			792			964	
Travel Time (s)		6.0			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1132	1290	302	191	447	1126	381	494	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1132	1290	302	191	447	1126	381	717	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

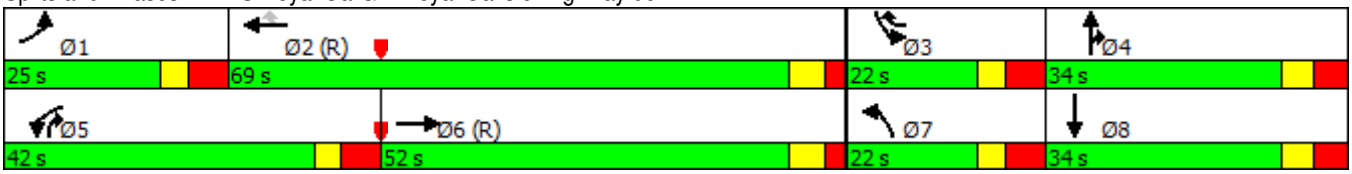


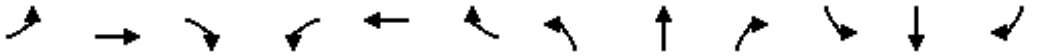
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.37	0.81	0.30	0.55	0.61	0.82	1.02	0.99	
Control Delay	68.2	51.1		205.3	32.2	12.8	59.8	67.4	45.2	117.0	86.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	68.2	51.1		205.3	32.2	12.8	59.8	67.4	45.3	117.0	86.1	
LOS	E	D		F	C	B	E	E	D	F	F	
Approach Delay		53.7			102.0			52.4			96.8	
Approach LOS		D			F			D			F	
Queue Length 50th (ft)	108	415		~750	651	140	92	235	454	~203	~360	
Queue Length 95th (ft)	151	475		m#569	m436	m122	m109	m268	m570	#272	#512	
Internal Link Dist (ft)		270			611			712			884	
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	724	
Starvation Cap Reductn	0	0		0	0	0	0	0	5	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.80		1.37	0.81	0.30	0.50	0.61	0.83	1.02	0.99	

Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 26 (17%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.37	
Intersection Signal Delay: 78.6	Intersection LOS: E

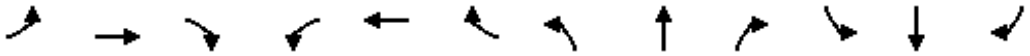
Intersection Capacity Utilization 90.4% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: S Royal Oaks/N Royal Oaks & Highway 96





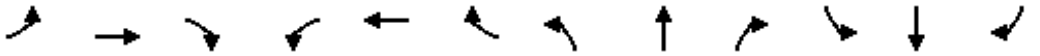
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2005	488	285	928	0	0	0	0	914	0	1455
Future Volume (vph)	0	2005	488	285	928	0	0	0	0	914	0	1455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			399									134
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2156	626	401	1079	0	0	0	0	1051	0	1653
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2156	626	401	1079	0	0	0	0	1051	0	1653
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.99	0.78	1.35	0.58					0.77		1.43
Control Delay		57.0	16.7	224.3	29.1					43.9		231.7
Queue Delay		0.0	0.0	0.0	1.3					1.2		0.0
Total Delay		57.0	16.7	224.3	30.5					45.0		231.7
LOS		E	B	F	C					D		F
Approach Delay		47.9			83.0							
Approach LOS		D			F							
Queue Length 50th (ft)		637	110	~525	329					457		~1200
Queue Length 95th (ft)		m#692	m118	#521	468					515		#1305
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	801	297	1865					1368		1154
Starvation Cap Reductn		0	0	0	535					0		0
Spillback Cap Reductn		0	0	0	0					136		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.99	0.78	1.35	0.81					0.85		1.43

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 42 (28%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 98.6		Intersection LOS: F	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Ent ramp to I-65/Exit ramp from I-65 & Highway 96

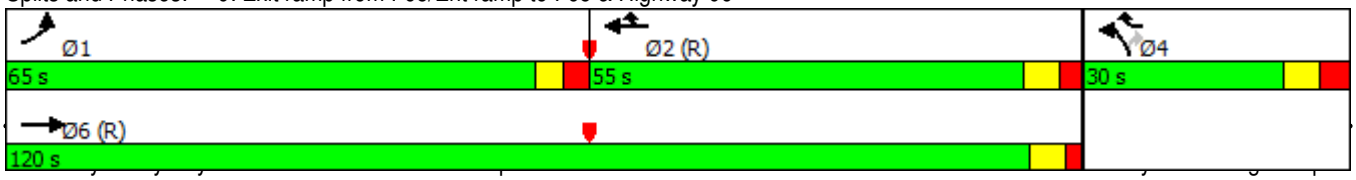


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	622	2297	0	0	897	998	316	0	164	0	0	0
Future Volume (vph)	622	2297	0	0	897	998	316	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						223			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	641	2344	0	0	986	1073	343	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	641	2344	0	0	986	1073	343	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	37.4	114.6			70.7	102.1	21.9		21.9			
Actuated g/C Ratio	0.25	0.76			0.47	0.68	0.15		0.15			
v/c Ratio	0.79	0.91			0.59	0.55	0.71		0.65			
Control Delay	79.8	22.6			32.0	11.0	70.0		48.9			
Queue Delay	0.0	7.5			0.0	0.0	0.3		0.0			
Total Delay	79.8	30.1			32.0	11.0	70.2		48.9			
LOS	E	C			C	B	E		D			
Approach Delay		40.7			21.0							
Approach LOS		D			C							
Queue Length 50th (ft)	340	582			368	219	166		112			
Queue Length 95th (ft)	m324	m495			487	330	222		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2575			1668	1978	495		298			
Starvation Cap Reductn	0	224			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	12		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.50	1.00			0.59	0.54	0.71		0.63			

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 80 (53%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 35.6		Intersection LOS: D	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 9: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	41	147	55	118	104	36	123	196	765	145
Future Volume (vph)	92	827	41	147	55	118	104	36	123	196	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.94	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt		0.990			0.905				0.850		0.850	
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1534	4806	0	1711	1630	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.119	0.956		0.685			0.236			0.253		
Satd. Flow (perm)	192	4806	0	1233	1630	0	440	1925	1583	471	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		105			52				127		105	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	65	186	95	162	139	62	134	261	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	945	0	186	257	0	139	62	134	261	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		41			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42		42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45		45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot		D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6			4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0		7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0		14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	19.0	77.0		14.0	35.0		14.0	35.0	24.0	24.0	82.0	
Total Split (%)	12.7%	51.3%		9.3%	23.3%		9.3%	23.3%	16.0%	16.0%	54.7%	
Maximum Green (s)	13.0	71.0		8.5	29.0		8.5	29.0	18.0	18.0	76.0	
Yellow Time (s)	3.0	4.0		3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0		2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5		-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5		3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0		1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min		None	None		None	None	None	None	C-Min	
Act Effct Green (s)	96.7	83.0		38.6	26.6		38.0	24.8	45.1	101.1	85.2	
Actuated g/C Ratio	0.64	0.55		0.26	0.18		0.25	0.17	0.30	0.67	0.57	
v/c Ratio	0.58	0.35		0.51	0.78		0.67	0.19	0.24	0.58	0.76	
Control Delay	22.9	17.7		49.6	62.4		58.6	52.5	7.0	17.2	11.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	22.9	17.7		49.6	62.4		58.6	52.5	7.0	17.2	11.1	
LOS	C	B		D	E		E	D	A	B	B	
Approach Delay		18.3			57.0			36.8		12.1		
Approach LOS		B			E			D		B		
Queue Length 50th (ft)	45	157		148	194		107	52	5	53	65	
Queue Length 95th (ft)	56	215		185	153		133	59	50	26	56	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70		75			100		195	180		
Base Capacity (vph)	265	2704		366	383		209	404	617	499	1629	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.52	0.35		0.51	0.67		0.67	0.15	0.22	0.52	0.76	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 16 (11%), Referenced to phase 2:SWL and 6:EBL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 22.5		Intersection LOS: C	
Intersection Capacity Utilization 58.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 23: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	90	1107	27	83	64	123	46	58	302	269	1133	93
Future Volume (vph)	90	1107	27	83	64	123	46	58	302	269	1133	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	12	11	12	12	11	12
Grade (%)	1%					-1%	2%				-2%	
Storage Length (ft)		135			100		120	0			220	0
Storage Lanes		3			1		1	1			2	0
Taper Length (ft)					50		50				50	
Lane Util. Factor	1.00	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95
Frt		0.850						0.850			0.987	
Flt Protected				0.950	0.950		0.950			0.950	0.956	
Satd. Flow (prot)	1764	3505	0	1736	1754	0	1752	1546	0	1805	3365	0
Flt Permitted	0.144			0.160	0.950		0.672			0.098	0.956	
Satd. Flow (perm)	254	3505	0	292	1754	0	1239	1546	0	186	3365	0
Right Turn on Red			Yes						Yes			Yes
Satd. Flow (RTOR)		124						168			76	
Link Speed (mph)	30					30	30				30	
Link Distance (ft)	1624					433	515				792	
Travel Time (s)	36.9					9.8	11.7				18.0	
Peak Hour Factor	0.79	0.95	0.64	0.86	0.71	0.82	0.75	0.88	0.94	0.75	0.90	0.76
Heavy Vehicles (%)	0%	1%	2%	1%	0%	0%	2%	0%	0%	1%	1%	0%
Adj. Flow (vph)	114	1165	42	97	90	150	61	66	321	359	1259	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1207	0	97	90	150	61	387	0	359	1381	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Left	Left	Right	Right	Left	Left	Right
Median Width(ft)	22					22	12				35	
Link Offset(ft)	0					0	0				0	
Crosswalk Width(ft)	16					16	16				16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	1.04	1.04	0.99	1.01	1.06	1.01	0.99	1.03	0.99
Turning Speed (mph)		9	9	15	15		15	9	9	15	15	9
Number of Detectors	1	1		1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226		42	42	50	42	42		42	226	
Trailing Detector (ft)	-3	220		-3	-3	0	-3	-3		-3	220	
Detector 1 Position(ft)	-3	220		-3	-3	0	-3	-3		-3	220	
Detector 1 Size(ft)	45	6		45	45	50	45	45		45	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	NA	custom		custom	Prot	NA	D.Pm	Prot		pm+pt	Prot	
Protected Phases	1	6			4	2!		8		5	2!	
Permitted Phases	6			8			4			2		
Detector Phase	1	6		8	4	2	4	8		5	2	
Switch Phase												

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Minimum Initial (s)	5.0	10.0		7.0	7.0	10.0	7.0	7.0		5.0	10.0	
Minimum Split (s)	15.0	70.0		50.0	50.0	85.0	50.0	50.0		30.0	85.0	
Total Split (s)	15.0	70.0		50.0	50.0	85.0	50.0	50.0		30.0	85.0	
Total Split (%)	10.0%	46.7%		33.3%	33.3%	56.7%	33.3%	33.3%		20.0%	56.7%	
Maximum Green (s)	8.5	64.0		43.0	43.0	79.0	43.0	43.0		23.5	79.0	
Yellow Time (s)	3.0	3.5		3.5	3.5	3.5	3.5	3.5		3.0	3.5	
All-Red Time (s)	3.5	2.5		3.5	3.5	2.5	3.5	3.5		3.5	2.5	
Lost Time Adjust (s)	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5		-1.0	-3.0	
Total Lost Time (s)	5.5	3.0		4.5	4.5		4.5	4.5		5.5	3.0	
Lead/Lag	Lead	Lag				Lag				Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min		None	None	C-Min	None	None		None	C-Min	
Walk Time (s)		7.0		8.0	8.0	7.0	8.0	8.0			7.0	
Flash Dont Walk (s)		16.0		35.0	32.0	20.0	32.0	35.0			20.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0			0	
Act Effct Green (s)	81.5	74.9		37.6	37.6	0.0	37.6	37.6		102.4	90.3	
Actuated g/C Ratio	0.54	0.50		0.25	0.25	0.00	0.25	0.25		0.68	0.60	
v/c Ratio	0.50	0.67		1.33	0.21	no cap	0.20	0.75		0.92	0.67	
Control Delay	28.8	37.6		261.2	43.0		42.8	37.5		63.2	3.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.8	
Total Delay	28.8	37.6		261.2	43.0	Error	42.8	37.5		63.2	4.0	
LOS	C	D		F	D	F	D	D		E	A	
Approach Delay	36.8					Err	38.2				16.2	
Approach LOS	D					F	D				B	
Queue Length 50th (ft)	45	282		~115	67	0	46	198		245	41	
Queue Length 95th (ft)	101	552		#216	87	0	69	299		m184	m17	
Internal Link Dist (ft)	1544					353	435				712	
Turn Bay Length (ft)		135		100	100		120			220	220	
Base Capacity (vph)	234	1812		88	532	1	375	585		391	2056	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	345	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.49	0.67		1.10	0.17	150.00	0.16	0.66		0.92	0.81	

Intersection Summary

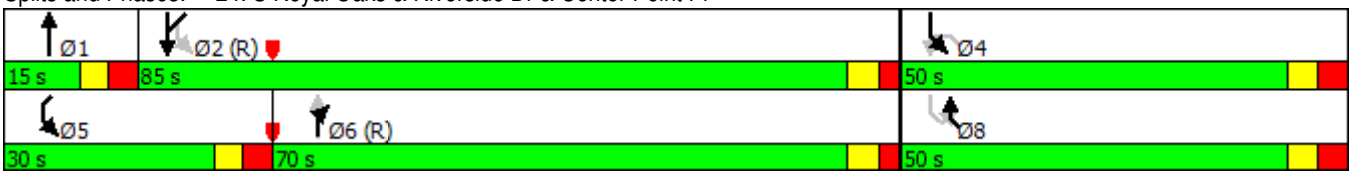
Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 136 (91%), Referenced to phase 2:SBSW and 6:NBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: Err
Intersection Signal Delay: Err — Intersection LOS: F
Intersection Capacity Utilization Err% — ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 24: S Royal Oaks & Riverside Dr & Center Point Pl



HCS 2010 Two-Way Stop Control Summary Report

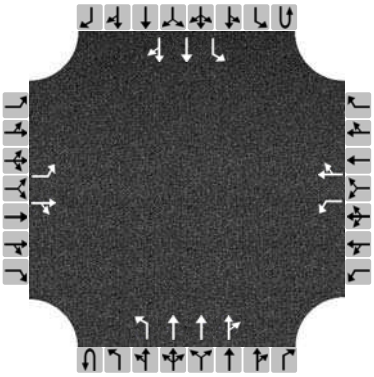
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	3	0	0	1	2	0
Configuration		L		TR		L		TR		L	T	TR		L	T	TR
Volume (veh/h)		26	1	9		14	0	40		10	1447	25		64	659	51
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		10		14		41		10				66		
Capacity		171		387		98		354		882				446		
v/c Ratio		0.16		0.03		0.14		0.12		0.01				0.15		
95% Queue Length		0.5		0.1		0.5		0.4		0.0				0.5		
Control Delay (s/veh)		30.0		14.5		47.8		16.5		9.1				14.5		
Level of Service (LOS)		D		B		E		C		A				B		
Approach Delay (s/veh)	25.8				24.5				0.1				1.2			
Approach LOS	D				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

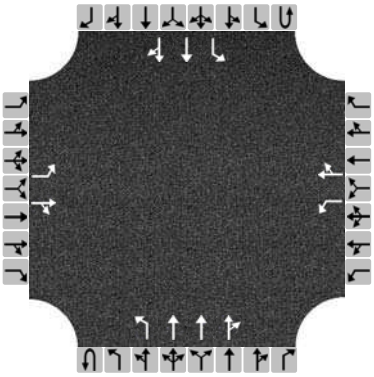
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	3	0	0	1	2	0
Configuration		L		TR		L		TR		L	T	TR		L	T	TR
Volume (veh/h)		26	3	16		21	4	52		6	1016	17		45	1023	105
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		20		22		58		6				47		
Capacity		138		328		156		413		602				656		
v/c Ratio		0.20		0.06		0.14		0.14		0.01				0.07		
95% Queue Length		0.7		0.2		0.5		0.5		0.0				0.2		
Control Delay (s/veh)		37.4		16.7		31.9		15.1		11.0				10.9		
Level of Service (LOS)		E		C		D		C		B				B		
Approach Delay (s/veh)	28.6				19.8				0.1				0.4			
Approach LOS	D				C				A				A			

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APPENDIX D
TRIP GENERATION

TRIP GENERATION CALCULATIONS – Assisted Living

The following calculations are based on the data compiled for ITE Land Use Code 254.

Average Daily Traffic

T = 2.74 (X)
T = 2.74 (**208**)
T = 570 vehicles

Enter = 0.50 (570) = 285 vehicles
Exit = 0.50 (570) = 285 vehicles

AM traffic during peak hour of adjacent street

T = 0.23 (X)
T = 0.23 (**208**)
T = 47 vehicles

Enter = 0.72 (47) = 34 vehicles
Exit = 0.28 (47) = 13 vehicles

PM traffic during peak hour of adjacent street

T = 0.37 (X)
T = 0.37 (**208**)
T = 77 vehicles

Enter = 0.39 (77) = 30 vehicles
Exit = 0.61 (77) = 47 vehicles

TRIP GENERATION CALCULATIONS – Multi-Family (North)

The following calculations are based on the data compiled for ITE Land Use Code 220.

Average Daily Traffic

T = 6.65 (X)
T = 6.65 (**240**)
T = 1,596 vehicle-trips

Enter = 0.50 (1,596) = 798 vehicles
Exit = 0.50 (1,596) = 798 vehicles

A.M. traffic during peak hour of adjacent street

T = 0.51 (X)
T = 0.51 (**240**)
T = 122 vehicle-trips

Enter = 0.20 (122) = 24 vehicles
Exit = 0.80 (122) = 98 vehicles

P.M. traffic during peak hour of adjacent street

T = 0.62 (X)
T = 0.62 (**240**)
T = 149 vehicle-trips

Enter = 0.65 (149) = 97 vehicles
Exit = 0.35 (149) = 52 vehicles

TRIP GENERATION CALCULATIONS – Multi-Family (South)

The following calculations are based on the data compiled for ITE Land Use Code 220.

Average Daily Traffic

T = 6.65 (X)
T = 6.65 (**115**)
T = 764 vehicle-trips

Enter = 0.50 (764) = 382 vehicles
Exit = 0.50 (764) = 382 vehicles

A.M. traffic during peak hour of adjacent street

T = 0.51 (X)
T = 0.51 (**115**)
T = 59 vehicle-trips

Enter = 0.20 (59) = 12 vehicles
Exit = 0.80 (59) = 47 vehicles

P.M. traffic during peak hour of adjacent street

T = 0.62 (X)
T = 0.62 (**115**)
T = 71 vehicle-trips

Enter = 0.65 (71) = 46 vehicles
Exit = 0.35 (71) = 25 vehicles

NEEL-SCHAFFER
Solutions you can build upon

engineers
planners
surveyors
environmental scientists
landscape architects

April 14, 2016
N-S Project No. 13194.001

Mr. Carl Baughman, P.E.
Traffic/Transportation Engineer
City of Franklin
109 3rd Avenue South
P. O. Box 305
Franklin, TN 37065-0305

Subject: Review of Updated Traffic Impact Study
Epoch Apartments – Oak Meadow Drive

Dear Carl:

Per your request, we have completed a review of the updated traffic study for the referenced proposed project. In response to staff and Neel-Schaffer comments, the applicant submitted a revised traffic study. This correspondence documents our follow-up remarks on the updated report.

- For the intersection of S. Royal Oaks Blvd and Riverside Dr., the study provided additional comments as requested (in new section 5.4 and updated section 6.0) about modifying the phasing of the traffic signal. The report addressed comments regarding the possibility of changing the signal phasing from its existing concurrent permissive-only side street phasing to protected-permitted left turn phasing. The study reported that the existing concurrent phasing results in more efficient (lower delay) operation, but that protected-permissive phasing might reduce driver indecision thereby allowing side street drivers to make more definitive turning movements. Our review did not find details documenting the protected-permissive phasing alternative in the appendix.

  We request, in conjunction with staff, that the study provide analysis print-outs in the appendix documenting the protected-permissive scenario. We desire to compare the AM and PM peak results of the two phasing options.

- The study, as requested, provided additional remarks (in new section 5.4) regarding level-of-service operation of Murfreesboro Rd at I-65 NB and SB ramps. The study attributed the continued unsatisfactory peak period levels-of-service to the significant traffic volumes traveling through the intersections/corridor. As mentioned in our original review memo, but not further addressed in the updated study, continued monitoring and updated traffic signal timings can help provide some mitigation.

- For the Eastern Home Depot Access Road and Project Access for the Northern Apartments intersection, we have two suggestions as potential improvement measures. First, we would recommend a more direct (less angled) connection between the apartment complex area and the Home Depot Access road. Also, we suggest that there be separate westbound left and right exit lanes (i.e. three-lane cross section) at the driveway intersection. The updated traffic study did not comment or address these remarks from the original review.

- For the Oak Meadow Drive and Eastern Project Access / Home Depot Access intersection, the updated traffic study did not address our original comments:
  - Emphasis that the design process consider and provide appropriate intersection sight distance for drivers exiting the south (NB) driveway access (recognizing the horizontal curve just to the east of the intersection)
  - Emphasis on addressing possible sight distance limitations for drivers traveling northbound/westbound on Oak Meadow Drive approaching the eastern driveway intersection. Proposed measures could include new signs, proper design/placement of proposed landscaping and removal of existing vegetation/overgrowth.
  - We recommend that the eastbound and westbound approaches of Oak Meadow Drive be modified to provide dedicated left-turn lanes as described in our original review

- For the Oak Meadow Drive and Western Project Access / Home Depot Access intersection, the updated traffic study did not address our original comments:
  - Recommendation of re-application of pavement markings on the Home Depot access road, including double-yellow centerline
  - Recommendation to modify the eastbound and westbound approaches of Oak Meadow Drive to provide dedicated left-turn lanes as described in our original review

- For the S. Royal Oaks Boulevard and Rand Place / Home Depot Access Road intersection, the updated traffic study did not address our original comments:
  - Recommendation for re-application of the westbound approach pavement markings as noted in our original review
  - We also suggest consideration be given to modifying the lane assignments for the westbound approach. Because of the predominant westbound right-turn movement, we suggest that the outside (curb) lane be converted to a right-turn only lane with the inside lane operating as a shared through-left lane. If pursued, this change would require new lane line pavement markings, turn arrow pavement markings and signing as mentioned in the original review

- Regarding Oak Meadow Drive, we suggest consideration be given to lowering the posted speed limit. We believe it may be appropriate to lower the speed limit along Oak Meadow Drive between S. Royal Oaks Blvd and the Home Depot eastern access driveway (currently 40mph) due to the proposed increase in active driveway connections and traffic volumes.

- The revised traffic study updated and/or adequately addressed all other comments provided in Neel-Schaffer's original review.

We appreciate the opportunity to provide our review comments and participate in the planning process. Please let us know if you need any additional information or have any questions.

Sincerely,
NEEL-SCHAFFER, INC.

Gregory Judy, P.E., PTOE
Engineer Manager

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	28	1198	103	6	46	41	33	12	96	267	747	25
Future Volume (vph)	28	1198	103	6	46	41	33	12	96	267	747	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	12	11	12	12	11	12
Grade (%)	1%					-1%	2%				-2%	
Storage Length (ft)		135			100		120	0			220	0
Storage Lanes		3			1		1	1			2	0
Taper Length (ft)					50		50				50	
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95
Frt		0.850	0.850					0.850			0.993	
Flt Protected				0.950	0.950		0.950			0.950	0.955	
Satd. Flow (prot)	1764	2707	1607	1754	1580	0	1787	1486	0	1787	3343	0
Flt Permitted	0.351			0.423	0.950		0.691			0.137	0.955	
Satd. Flow (perm)	619	2707	1607	781	1580	0	1300	1486	0	258	3343	0
Right Turn on Red			Yes						Yes			Yes
Satd. Flow (RTOR)			82					112			82	
Link Speed (mph)	30					30	30				30	
Link Distance (ft)	1624					433	515				792	
Travel Time (s)	36.9					9.8	11.7				18.0	
Peak Hour Factor	0.63	0.92	0.87	0.58	0.68	0.77	0.67	0.63	0.86	0.80	0.99	0.67
Heavy Vehicles (%)	0%	1%	0%	0%	11%	0%	0%	10%	3%	2%	2%	4%
Adj. Flow (vph)	44	1302	118	10	68	53	49	19	112	334	755	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1302	118	10	68	53	49	131	0	334	792	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Left	Left	Right	Right	Left	Left	Right
Median Width(ft)	22					22	12				35	
Link Offset(ft)	0					0	0				0	
Crosswalk Width(ft)	16					16	16				16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	1.04	1.04	0.99	1.01	1.06	1.01	0.99	1.03	0.99
Turning Speed (mph)		9	9	15	15		15	9	9	15	15	9
Number of Detectors	1	1	0	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	42	50	42	42		42	226	
Trailing Detector (ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Position(ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Size(ft)	45	6	50	45	45	50	45	45		45	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	NA	custom	custom	custom	Prot	NA	D.Pm	Prot		pm+pt	Prot	
Protected Phases	1	6			4			8		5	2	
Permitted Phases	6		6	8			4			2		
Detector Phase	1	6		8	4		4	8		5	2	
Switch Phase												

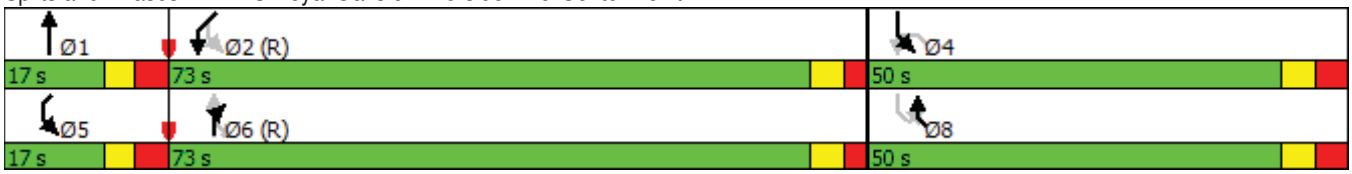
Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Minimum Initial (s)	5.0	10.0	10.0	7.0	7.0		7.0	7.0		5.0	10.0	
Minimum Split (s)	17.0	73.0	73.0	50.0	50.0		50.0	50.0		17.0	73.0	
Total Split (s)	17.0	73.0	73.0	50.0	50.0		50.0	50.0		17.0	73.0	
Total Split (%)	12.1%	52.1%	52.1%	35.7%	35.7%		35.7%	35.7%		12.1%	52.1%	
Maximum Green (s)	10.5	67.0	67.0	43.0	43.0		43.0	43.0		10.5	67.0	
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5		3.5	3.5		3.0	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	3.5		3.5	3.5		3.5	2.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-2.5	-2.5		-2.5	-2.5		-1.0	-3.0	
Total Lost Time (s)	5.5	3.0	3.0	4.5	4.5		4.5	4.5		5.5	3.0	
Lead/Lag	Lead	Lag	Lag							Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	None		None	None		None	C-Min	
Walk Time (s)		7.0	7.0	8.0	8.0		8.0	8.0			7.0	
Flash Dont Walk (s)		16.0	16.0	35.0	32.0		32.0	35.0			20.0	
Pedestrian Calls (#/hr)		0	0	0	0		0	0			0	
Act Effct Green (s)	106.2	101.1	101.1	14.4	14.4	0.0	14.4	14.4		114.1	107.4	
Actuated g/C Ratio	0.76	0.72	0.72	0.10	0.10	0.00	0.10	0.10		0.82	0.77	
v/c Ratio	0.08	0.67	0.10	0.12	0.42	no cap	0.37	0.52		1.00	0.31	
Control Delay	3.3	13.0	2.6	58.5	65.8		65.1	21.2		70.3	8.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.3	13.0	2.6	58.5	65.8	Error	65.1	21.2		70.3	8.3	
LOS	A	B	A	E	E	F	E	C		E	A	
Approach Delay	11.9					Err	33.2				26.7	
Approach LOS	B					F	C				C	
90th %ile Green (s)	7.5	93.3	93.3	16.7	16.7		16.7	16.7		10.5	96.3	
90th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
70th %ile Green (s)	6.9	96.2	96.2	13.8	13.8		13.8	13.8		10.5	99.8	
70th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
50th %ile Green (s)	6.6	98.1	98.1	11.9	11.9		11.9	11.9		10.5	102.0	
50th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
30th %ile Green (s)	6.3	100.0	100.0	10.0	10.0		10.0	10.0		10.5	104.2	
30th %ile Term Code	Gap	Coord	Coord	Hold	Gap		Gap	Hold		Max	Coord	
10th %ile Green (s)	0.0	102.8	102.8	7.2	7.2		7.2	7.2		10.5	119.8	
10th %ile Term Code	Skip	Coord	Coord	Hold	Hold		Hold	Hold		Max	Coord	
Stops (vph)	6	624	11	6	41	0	30	25		205	368	
Fuel Used(gal)	0	22	1	0	1	0	1	1		7	8	
CO Emissions (g/hr)	28	1523	99	9	70	10	51	73		462	567	
NOx Emissions (g/hr)	6	296	19	2	14	2	10	14		90	110	
VOC Emissions (g/hr)	7	353	23	2	16	2	12	17		107	131	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0		0	0	
Queue Length 50th (ft)	6	326	8	8	59	0	42	16		168	68	
Queue Length 95th (ft)	10	459	28	17	79	0	61	24		m#163	m336	
Internal Link Dist (ft)	1544					353	435				712	
Turn Bay Length (ft)		135	135	100	100		120			220	220	
Base Capacity (vph)	580	1954	1182	253	513	1	422	558		335	2583	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Reduced v/c Ratio	0.08	0.67	0.10	0.04	0.13	53.00	0.12	0.23		1.00	0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SWL and 6:NBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: Err			
Intersection Signal Delay: Err		Intersection LOS: F	
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: S Royal Oaks & Riverside Dr & Center Point Pl



Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	90	1063	27	83	64	123	46	58	288	232	1063	93
Future Volume (vph)	90	1063	27	83	64	123	46	58	288	232	1063	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	12	11	12	12	11	12
Grade (%)	1%					-1%	2%				-2%	
Storage Length (ft)		135			100		120	0			220	0
Storage Lanes		3			1		1	1			2	0
Taper Length (ft)					50		50				50	
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95
Frt		0.850	0.850					0.850			0.986	
Flt Protected				0.950	0.950		0.950			0.950	0.957	
Satd. Flow (prot)	1764	2707	1575	1736	1754	0	1752	1546	0	1805	3365	0
Flt Permitted	0.166			0.168	0.950		0.670			0.116	0.957	
Satd. Flow (perm)	293	2707	1575	307	1754	0	1236	1546	0	220	3365	0
Right Turn on Red			Yes						Yes			Yes
Satd. Flow (RTOR)			124					158			76	
Link Speed (mph)	30					30	30				30	
Link Distance (ft)	1624					433	515				792	
Travel Time (s)	36.9					9.8	11.7				18.0	
Peak Hour Factor	0.79	0.95	0.64	0.86	0.71	0.82	0.75	0.88	0.94	0.75	0.90	0.76
Heavy Vehicles (%)	0%	1%	2%	1%	0%	0%	2%	0%	0%	1%	1%	0%
Adj. Flow (vph)	114	1119	42	97	90	150	61	66	306	309	1181	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1119	42	97	90	150	61	372	0	309	1303	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Left	Left	Right	Right	Left	Left	Right
Median Width(ft)	22					22	12				35	
Link Offset(ft)	0					0	0				0	
Crosswalk Width(ft)	16					16	16				16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	1.04	1.04	0.99	1.01	1.06	1.01	0.99	1.03	0.99
Turning Speed (mph)		9	9	15	15		15	9	9	15	15	9
Number of Detectors	1	1	0	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	42	50	42	42		42	226	
Trailing Detector (ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Position(ft)	-3	220	0	-3	-3	0	-3	-3		-3	220	
Detector 1 Size(ft)	45	6	50	45	45	50	45	45		45	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	NA	custom	custom	custom	Prot	NA	D.Pm	Prot		pm+pt	Prot	
Protected Phases	1	6			4	2!		8		5	2!	
Permitted Phases	6		6	8			4			2		
Detector Phase	1	6		8	4	2	4	8		5	2	
Switch Phase												

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Minimum Initial (s)	5.0	10.0	10.0	7.0	7.0	10.0	7.0	7.0		5.0	10.0	
Minimum Split (s)	15.0	70.0	70.0	50.0	50.0	85.0	50.0	50.0		30.0	85.0	
Total Split (s)	14.0	72.0	72.0	49.0	49.0	87.0	49.0	49.0		29.0	87.0	
Total Split (%)	9.3%	48.0%	48.0%	32.7%	32.7%	58.0%	32.7%	32.7%		19.3%	58.0%	
Maximum Green (s)	7.5	66.0	66.0	42.0	42.0	81.0	42.0	42.0		22.5	81.0	
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.0	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	3.5	2.5	3.5	3.5		3.5	2.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-2.5	-2.5		-2.5	-2.5		-1.0	-3.0	
Total Lost Time (s)	5.5	3.0	3.0	4.5	4.5		4.5	4.5		5.5	3.0	
Lead/Lag	Lead	Lag	Lag			Lag				Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	None	C-Min	None	None		None	C-Min	
Walk Time (s)		7.0	7.0	8.0	8.0	7.0	8.0	8.0			7.0	
Flash Dont Walk (s)		16.0	16.0	35.0	32.0	20.0	32.0	35.0			20.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0			0	
Act Effct Green (s)	84.9	79.0	79.0	36.4	36.4	0.0	36.4	36.4		103.6	92.2	
Actuated g/C Ratio	0.57	0.53	0.53	0.24	0.24	0.00	0.24	0.24		0.69	0.61	
v/c Ratio	0.46	0.79	0.05	1.31	0.21	no cap	0.20	0.75		0.82	0.62	
Control Delay	17.9	35.9	0.1	250.3	44.0		43.8	38.5		41.1	13.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	1.5	
Total Delay	17.9	35.9	0.1	250.3	44.0	Error	43.8	38.5		41.1	14.6	
LOS	B	D	A	F	D	F	D	D		D	B	
Approach Delay	33.1					Err	39.3				19.7	
Approach LOS	C					F	D				B	
90th %ile Green (s)	7.5	66.0	66.0	42.0	42.0	81.0	42.0	42.0		22.5	81.0	
90th %ile Term Code	Max	Coord	Coord	Max	Hold	Coord	Hold	Max		Max	Coord	
70th %ile Green (s)	7.5	66.0	66.0	42.0	42.0	81.0	42.0	42.0		22.5	81.0	
70th %ile Term Code	Max	Coord	Coord	Max	Hold	Coord	Hold	Max		Max	Coord	
50th %ile Green (s)	7.5	70.5	70.5	37.5	37.5	85.5	37.5	37.5		22.5	85.5	
50th %ile Term Code	Max	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Max	Coord	
30th %ile Green (s)	7.5	79.5	79.5	29.9	29.9	93.1	29.9	29.9		21.1	93.1	
30th %ile Term Code	Max	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Gap	Coord	
10th %ile Green (s)	6.8	98.0	98.0	18.3	18.3	105.4	18.3	18.3		14.2	105.4	
10th %ile Term Code	Gap	Coord	Coord	Gap	Hold	Coord	Hold	Gap		Gap	Coord	
Stops (vph)	42	838	0	67	48	0	35	190		209	817	
Fuel Used(gal)	2	26	0	5	1	0	1	5		5	15	
CO Emissions (g/hr)	119	1808	24	341	74	29	55	360		317	1030	
NOx Emissions (g/hr)	23	352	5	66	14	6	11	70		62	200	
VOC Emissions (g/hr)	28	419	6	79	17	7	13	83		73	239	
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0		0	0	
Queue Length 50th (ft)	37	530	0	~114	69	0	46	195		162	645	
Queue Length 95th (ft)	58	#692	0	#214	88	0	70	293		m114	m571	
Internal Link Dist (ft)	1544					353	435				712	
Turn Bay Length (ft)		135	135	100	100		120			220	220	
Base Capacity (vph)	249	1425	888	91	520	1	366	569		400	2097	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	558	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	

Lane Group	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2	SWL2	SWL	SWR
Reduced v/c Ratio	0.46	0.79	0.05	1.07	0.17	150.00	0.17	0.65		0.77	0.85	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 123 (82%), Referenced to phase 2:SBSW and 6:NBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: Err			
Intersection Signal Delay: Err		Intersection LOS: F	
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

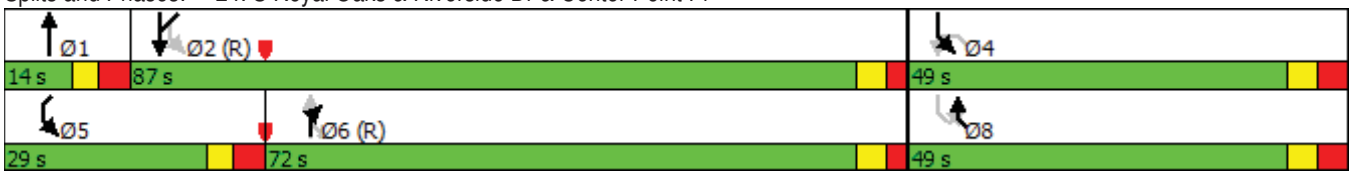
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 24: S Royal Oaks & Riverside Dr & Center Point Pl



SITE DATA

PROJECT NAME	OAK MEADOWS EPOCH DEVELOPMENT REZONING & PUD APPLICATION
PROJECT NUMBER:	TBD
LOTS:	2 EXISTING, 3 PROPOSED
ADDRESS:	840 & 880 OAK MEADOWS DR.
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH
MAP, GROUP AND PARCEL NUMBERS:	MAP 79, PARCELS 88.00 (PORTION OF) & 101.19
EXISTING ZONING:	GC (GENERAL COMMERCIAL)
PROPOSED ZONING:	SD-R (12) (SPECIFIC DEVELOPMENT RESIDENTIAL 12 UNITS/AC)
CHARACTER AREA OVERLAY:	MECO-5
OTHER APPLICABLE OVERLAYS:	FFO & FWO
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	13.06 + 17.33 = 30.39 ACRES
SQUARE FOOTAGE OF SITE:	569,021 + 754,942 = 1,323,963 SQUARE FEET
MINIMUM REQUIRED SETBACK LINES:	ATTACHED RESIDENTIAL USE
YARD FRONTING COLLECTOR (OAK MEADOWS)	40'
SIDE YARD	15'
REAR YARD	30'
OWNER (BOTH PARCELS):	E. WARNER BASS, TRUSTEE
ADDRESS:	150 3RD AVE. SOUTH, SUITE 2800, NASHVILLE, TN 37201
PHONE NO.:	615.742.6400
E-MAIL ADDRESS:	wbass@bassberry.com
CONTACT NAME:	MR. WARNER BASS
MINERAL RIGHTS:	CONTROLLED BY CURRENT PROPERTY OWNER
APPLICANT:	CRUNK ENGINEERING LLC
ADDRESS:	1894 GEN. GEORGE PATTON DR., SUITE 600 FRANKLIN, TN 37067
PHONE NO.:	615.873.1795
E-MAIL ADDRESS:	adam@crunkeng.com
CONTACT NAME:	MR. ADAM CRUNK, P.E.

DENSITY

ATTACHED DWELLING UNITS	355 UNITS
LAND AREA	30.39 ACRES
LAND AREA WITHIN FLOODPLAIN OVERLAY	8.32 ACRES
OVERALL DENSITY	11.7 UNITS/ACRE
NET DENSITY (MINUS OVERLAY CONSTRAINT)	16.1 UNITS/ACRE

BUILDING HEIGHT

ALLOWABLE	6 STORIES MAXIMUM
PROPOSED	NORTH PARCEL - 4 STORIES SOUTH PARCEL 2/3 STORIES (2 STORY FACING STREET)

PROPOSED LANDSCAPE SURFACE RATIO: NORTH SITE - 0.42; SOUTH SITE - 0.56; COMBINED - 0.50
MINIMUM LANDSCAPE SURFACE RATIO: 0.20

PARKING

EXISTING 0

REQUIRED (1.5/1BR + 2.5/2BR + 3/3BR)

NORTH SITE		SOUTH SITE	
1BR - 104 UNITS * 1.5 =	156 SPACES	1BR - 45 UNITS * 1.5 =	68 SPACES
2BR - 112 UNITS * 2.5 =	280 SPACES	2BR - 50 UNITS * 2.5 =	125 SPACES
3BR - 24 UNITS * 3.0 =	72 SPACES	3BR - 20 UNITS * 3.0 =	60 SPACES
TOTAL REQUIRED	= 508 SPACES	TOTAL REQUIRED	= 253 SPACES
INCLUDING 9 ADA SPACES		INCLUDING 7 ADA SPACES	

MAXIMUM PARKING NORTH SITE - 610 SPACES; SOUTH SITE - 304 SPACES

*MODIFICATION OF STANDARD REQUEST TO REDUCE PARKING REQUIREMENT TO 1.75 PER UNIT
NORTH SITE = 240 X 1.75 = 420 SPACES
SOUTH SITE = 115 X 1.75 = 202 SPACES

PROPOSED

NORTH SITE		SOUTH SITE (APTS. ONLY)	
REGULAR SPACES	329	REGULAR SPACES	198
COMPACT SPACES (22 % OF TOTAL)	84	COMPACT SPACES (8 % OF TOTAL)	19
ADA SPACES	16	ADA SPACES	8
TOTAL PROVIDED	429	TOTAL PROVIDED	225
		SOUTH SITE (AMENITY CTR.)	
		REGULAR SPACES	24
		COMPACT SPACES (0% OF TOTAL)	0
		ADA SPACES	2
		TOTAL PROVIDED	26

TREE CANOPY:

EXISTING CANOPY COVERAGE	NORTH SITE - 9%	SOUTH SITE - 65%
REQUIRED PERCENTAGE TO REMAIN	NORTH SITE - 54%	SOUTH SITE - 36%
PROPOSED PERCENTAGE TO REMAIN	NORTH SITE - 54%	SOUTH SITE - 42%

PARKLAND DEDICATION: FEE IN LIEU OF FOR 5.37 ACRES, 355 TOTAL UNITS PROPOSED

OPEN SPACE:

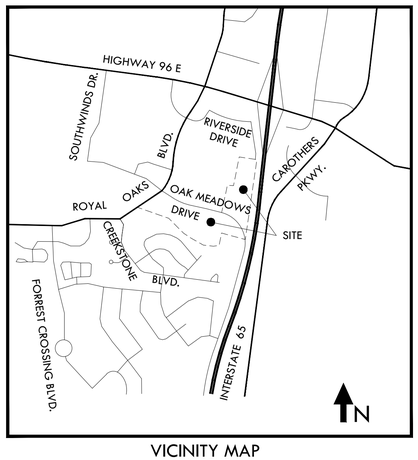
TOTAL OPEN SPACE REQ'D (15% OF 30.39 AC.)	4.56 AC.
FORMAL OPEN SPACE REQUIRED (33% OF OPEN SPACE REQUIRED)	1.52 AC.
	1.65 AC. PROVIDED
INFORMAL OPEN SPACE REQUIRED (67% OF OPEN SPACE REQUIRED)	3.04 AC.
	8.9 AC. PROVIDED

USE BUFFER: 50-FT CLASS C INCOMPATIBLE LAND USE BUFFER (SOUTH PORTION OF SOUTH SITE)
40-FT INTERSTATE BUFFER (EAST PORTION OF NORTH SITE)

NOTES:

PROPERTY IS LOCATED ON MAP 79 AS A PORTION OF LOT 88.00 AND PARCEL 101.19 CONTAINING 30.39 ACRES.

PARCEL 88.00 DOES LIE WITHIN THE 100-YEAR FLOOD PLAIN AS INDICATED BY FIRM MAP NO. 47187C0212F DATED SEPTEMBER 29, 2006.



VICINITY MAP
NO SCALE

REZONING

The Epoch Development

REZONING SUBMITTAL

Franklin, Williamson County, Tennessee

CITY OF FRANKLIN PROJECT NO. 6085

APRIL 7 2016

PREPARED FOR:

EPOCH RESIDENTIAL

359 Carolina Avenue
Winter Park, Florida
(407) 644-9055

STATEMENT OF IMPACT - POLICE, FIRE, SOLID WASTE, PARKS:
The proposed project will add 355 multi-family units. The property is currently undeveloped within the existing City Limits of the City of Franklin. Therefore, no new land is being developed outside the existing jurisdiction of City of Franklin Police, Fire, or Solid Waste services.

The project is approximately a 4 mile driving distance from the Police Station; 1.5 mile driving distance from the nearest fire station on Murfreesboro Rd.
The project will have two dumpster locations for solid waste. One serving 240 units and the other serving 115 units.
No new parkland is being dedicated as part of this project. However, this project will contribute to parkland funds.

STATEMENT OF IMPACT - STORMWATER:

The proposed development contains two site features that will be protected during construction. The south site contains a wetland area as well as a stream, Watson Branch. the site has been designed not to impact these site features. The required buffers for each feature have been shown on these plans.

STATEMENT OF IMPACT - TRANSPORTATION:
The proposed project will add 355 multi-family units with access along Oak Meadow Drive and Riverside Drive. The primary road corridor serving the project is the major arterial South Royal Oaks Boulevard. Based on the traffic study performed for this project, the majority of traffic will be directed in the northernly direction toward Cool Springs.

STATEMENT OF IMPACTS - WATER AND SEWER:
The proposed project is the construction of 355 new attached dwelling units with a mixture of one, two, and three bedroom units. The project will result in a projected flow of 101,250 GPD. The Northern site will be served by water off of the existing 10" main in the old Riverside Drive ROW, and sewer at the existing manhole behind the Home Depot. The Southern site will be served by water with a new 8" main along Oak Meadow Dr. that will connect from Royal Oaks Blvd. and tie into the 10" main along the old Riverside Drive ROW, and sewer will be served by the existing 24" main that runs along Watson Branch on the subject property. Reclaimed water is not located in the project vicinity.

SHEET NO.	SHEET TITLE
C0.0	COVER SHEET
C1.0	OVERALL EXISTING CONDITIONS
C1.1	NORTH SITE EXISTING CONDITIONS
C1.2	SOUTH SITE EXISTING CONDITIONS

CRUNK ENGINEERING LLC
1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

ENGINEERING CRUNK

WILSON CRUNK REGISTERED LANDSCAPE ARCHITECT AGRICULTURE No. 114180 STATE OF TENNESSEE 4/7

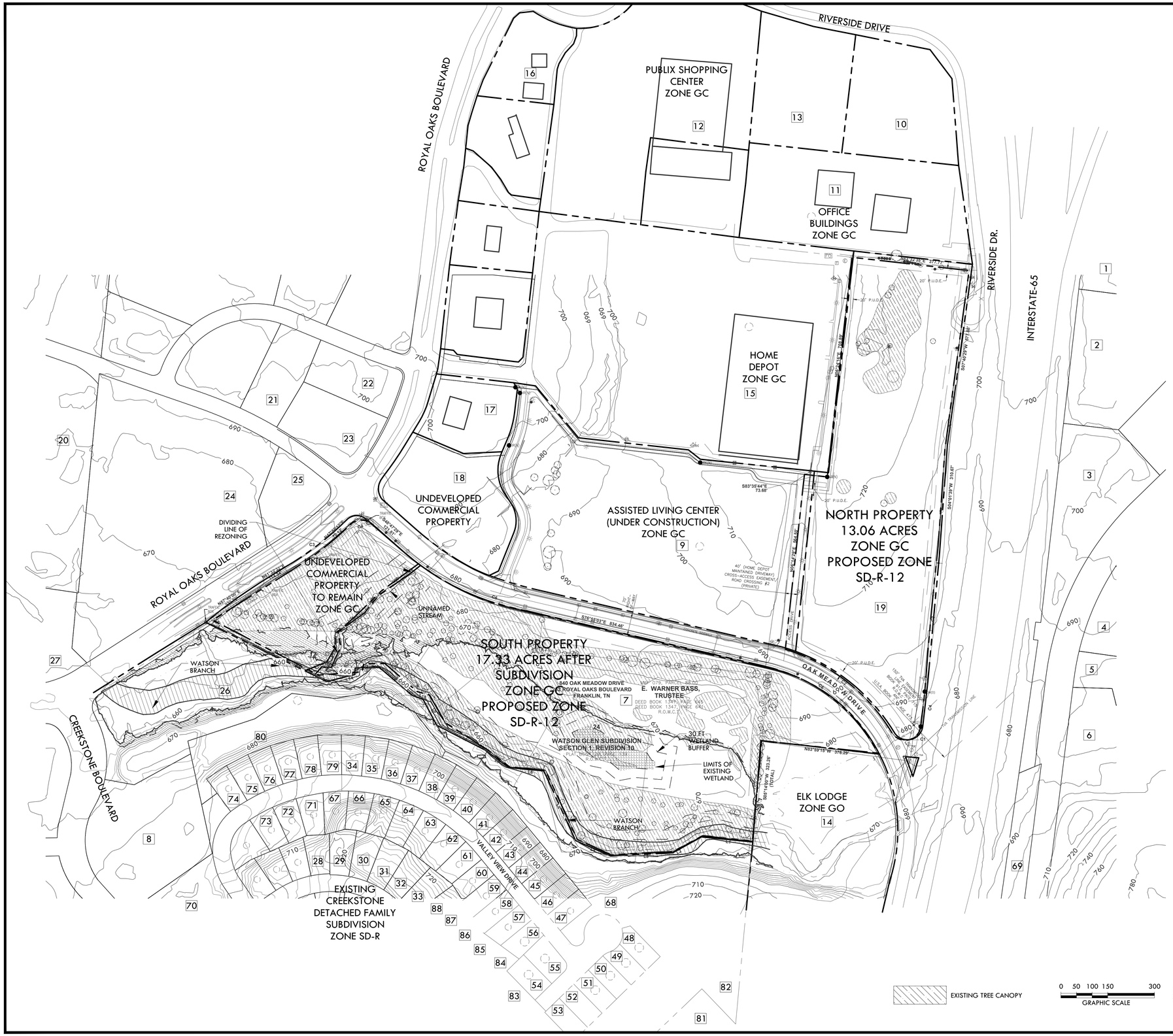
THE EPOCH DEVELOPMENT
REZONING SUBMITTAL
COF #6085 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C0.0

COVER SHEET



ID	PRCUID	DEED / PLAT	LAND USE	OWNER	ZONING
1	079---06905	DB 3844 DP 619 PB116 PP114	HOTEL	BRE/LQ PROP LLC	GC
2	079---06906	DB 2966 DP 435 PB22 PP11	AUTO DLR	ADKINS RODNEY G	GC
3	079---07600	DB 4341 DP763 PB22 PP11	CHURCH	CHURCH GATE THE	GC
4	079---08000	DB6337 DP70 PB61 PP69	REC	SOAR ADVENTURE TOWER LLC	GC
5	079---08200	DB5165 DP555	UNDEV.	NICHOLS J DONALD	SD-R
6	079---08300	DB1350 DP525	ATTACHED RESID.	UNITED DOMINION REALTY LP	GC
7	079---08800	DB1347 DP645 PB29 PP139	UNDEV.	BASS E WARNER TR	GC
8	079---10001	DB2192 DP320 PB31 PP125	DAYCARE	WOOD & WOOD LLC	GO
9	079---10100	DB6533 DP243 PB62 PP45	ASST. LVG	DOMINION SENIOR LIVING OF FRANKLIN L	GC
10	079---10101	DB5434 DP690	OFFICE	5107 LLC	GC
11	079---10102	DB2200 DP199 PB19 PP59	OFFICE	LIN DON REALTY LLC	GC
12	079---10103	DB5459 DP859 PB59 PP3	RETAIL	PUBLIX TENNESSEE LLC	GC
13	079---10104	DB6168 DP806 PB22 PP120	ASST. LVG	FRANKLIN TN SENIOR CARE PROPERTY LLC	GC
14	079---10105		REC	NASHVILLE LODGE #72 BPO ELKS	GO
15	079---10110	DB4406 DP792 PB29 PP138	RETAIL	HD DEVELOPMENT OF MARYLAND INC	GC
16	079---10114	DB5459 DP859 PB29 PP139	RETAIL	PUBLIX TENNESSEE LLC	GC
17	079---10116	DB1792 DP29 PB29 PP139	RETAIL	FIRST-CITIZENS BANK AND TR CO	GC
18	079---10117	PB 43 PP40	UNDEV.	BASS E WARNER TR	GC
19	079---10119	PB 43 PP40	UNDEV.	BASS E WARNER TR	GC
20	079I-A01401	DB4197 DP993 PB41 PP33	UNDEV.	SWJ2 TENNESSEE LLC	RM-20
21	079O-A00300	DB4200 DP849 PB27 PP4	INSTIT.	CHURCH CORNERSTONE-MINISTRIES INC	GC
22	079O-A00301	DB5790 DP107 PB29 PP10	RETAIL	MAGLI CHERYL S FAMILY TRUST	GC
23	079O-A00302	DB5871 DP528 PB26 PP10	RETAIL	LCJ LLC	GC
24	079O-A00400	DB794 DP881 PB12 PP76		UNITED STATES POSTAL SERV	CI
25	079O-A00401	DB1946 DP286 PB12 PP76	RETAIL	COMMUNITY BANK	GC
26	079O-G02500	DB5136 DP628	UNDEV.	CADENCE BANK NA	GO
27	079O-O02800	PB47 PP142	UNDEV.	ROYAL OAKS PARK SOUTH	GO
28	079O-000100	DB5814 DP815 PB55 PP146	RESIDENTIAL	THURM DAVID M	SD-R
29	079O-000200	DB5807 DP985 PB55 PP146	RESIDENTIAL	HAMILTON MALLORY	SD-R
30	079O-000300	DB6624 DP480 PB55 PP146	RESIDENTIAL	LYLE JORDAN WILLIAM	SD-R
31	079O-000400	DB5780 DP386 PB55 PP146	RESIDENTIAL	EVANGELISTA BERNARDINO JR	SD-R
32	079O-000500	DB5841 DP984 PB55 PP146	RESIDENTIAL	CASTANEDA ORESTES	SD-R
33	079O-000600	DB5809 DP135 PB55 PP146	RESIDENTIAL	VOSS STEPHEN M	SD-R
34	079O-E00100	DB6336 DP118 PB58 PP10	RESIDENTIAL	KHOT SOHAM	SD-R
35	079O-E00200	DB6190 DP252 PB58 PP10	RESIDENTIAL	GOOCH RYAN M	SD-R
36	079O-E00300	DB6218 DP405 PB58 PP10	RESIDENTIAL	SULLIVAN JOHN	SD-R
37	079O-E00400	DB6232 DP972 PB58 PP10	RESIDENTIAL	CULLEN ROBERT BARRY	SD-R
38	079O-E00500	DB6231 DP1 PB58 PP10	RESIDENTIAL	MILLER ROBERT FRANK	SD-R
39	079O-E00600	DB6288 DP734 PB58 PP10	RESIDENTIAL	DHARANI KHAIRUNISSA	SD-R
40	079O-E00700	DB6218 DP407 PB58 PP10	RESIDENTIAL	KNOX CONSUELIA S	SD-R
41	079O-E00800	DB6229 DP797 PB58 PP10	RESIDENTIAL	DAWKINS BRETTON GUY	SD-R
42	079O-E00900	DB6296 DP854 PB58 PP10	RESIDENTIAL	COMEAUX MARGARET A	SD-R
43	079O-E01000	DB6273 DP312 PB58 PP10	RESIDENTIAL	SMITH CHRISTOPHER S	SD-R
44	079O-E01100	DB6281 DP281 PB58 PP10	RESIDENTIAL	DANIELS THOMAS	SD-R
45	079O-E01200	DB6341 DP640 PB58 PP10	RESIDENTIAL	SUNDARAM BARATH SHANMUGA	SD-R
46	079O-E01300	DB6331 DP190 PB58 PP10	RESIDENTIAL	HOSSAIN MOHAMMAD	SD-R
47	079O-E01400	DB6264 DP154 PB58 PP10	RESIDENTIAL	MAPLESDEN LAWRENCE	SD-R
48	079O-E01500	DB6346 DP779 PB58 PP10	RESIDENTIAL	BECHARD BRIAN	SD-R
49	079O-E01600	DB6329 DP817 PB58 PP10	RESIDENTIAL	VIDYAM SATHEESH	SD-R
50	079O-E01700	DB6145 DP158 PB58 PP10	RESIDENTIAL	RUSSO JOHN M	SD-R
51	079O-E01800	DB6177 DP164 PB58 PP10	RESIDENTIAL	QUIGLEY J PATRICK	SD-R
52	079O-E01900	DB6151 DP238 PB58 PP10	RESIDENTIAL	BONHAM SYDNEY	SD-R
53	079O-E02000	DB6156 DP254 PB58 PP10	RESIDENTIAL	BURGER JORDAN	SD-R
54	079O-E02100	DB6172 DP871 PB58 PP10	RESIDENTIAL	NOLAN MICHAEL S TRUST	SD-R
55	079O-E02200	DB6195 DP626 PB58 PP10	RESIDENTIAL	PARSI SREEKANTH	SD-R
56	079O-E02300	DB6329 DP771 PB58 PP10	RESIDENTIAL	KOLLI MURALL KRISHNA	SD-R
57	079O-E02400	DB6252 DP619 PB58 PP10	RESIDENTIAL	KAMAN VENKATESH	SD-R
58	079O-E02500	DB6231 DP816 PB58 PP10	RESIDENTIAL	RAJENDRAN THAMIL S	SD-R
59	079O-E02600	DB6195 DP601 PB58 PP10	RESIDENTIAL	DOPPALAPUDI SRIKANTH	SD-R
60	079O-E02700	DB6182 DP362 PB58 PP10	RESIDENTIAL	CHINTAKINDI VARUN K	SD-R
61	079O-E02800	DB6177 DP138 PB58 PP10	RESIDENTIAL	KRISHNAN JAGADEESWARAN	SD-R
62	079O-E02900	DB6152 DP63 PB58 PP10	RESIDENTIAL	MOHAMED ABDUL R J	SD-R
63	079O-E03000	DB6153 DP125 PB58 PP10	RESIDENTIAL	PICHAIMUTHU NARAYANAN	SD-R
64	079O-E03100	DB6100 DP536 PB58 PP10	RESIDENTIAL	ZELLER JAMES S JR	SD-R
65	079O-E03200	DB6583 DP472 PB58 PP10	RESIDENTIAL	MURRAY KIMBERLY	SD-R
66	079O-E03300	DB6172 DP802 PB58 PP10	RESIDENTIAL	ZIPPER NATHAN M	SD-R
67	079O-E03400	DB6154 DP157 PB58 PP10	RESIDENTIAL	VIGIL MARIO G	SD-R
68	079O-E03500	DB6104 DP222 PB58 PP10	RESIDENTIAL	CREEKSTONES HOMEOWNERS ASSOCIATION I	SD-R
69	089---02609	DB3915 DP 891 PB14 PP17	RESIDENTIAL	A T & T CORP BY & THROUGH	R-2
70	089B-004200	DB5309 DP243 PB54 PP20	RESIDENTIAL	CREEKSTONE HOMEOWNERS ASSOCIATION IN	SD-R
71	089B-004600	DB5727 DP67 PB54 PP20	RESIDENTIAL	BLACKSHER NICOLE E	SD-R
72	089B-004700	DB6656 DP836 PB54 PP20	RESIDENTIAL	DRUSE JONATHAN	SD-R
73	089B-004800	DB5674 DP620 PB54 PP20	RESIDENTIAL	KUMAR RATNA	SD-R
74	089B-005000	DB6412 DP384 PB54 PP20	RESIDENTIAL	BLANKENSHIP JON I	SD-R
75	089B-005100	DB5710 DP738 PB54 PP20	RESIDENTIAL	BURRELL GERALD MARK	SD-R
76	089B-005200	DB5716 DP104 PB54 PP20	RESIDENTIAL	BUCKNER RICHARD D	SD-R
77	089B-005300	DB5604 DP513 PB54 PP20	RESIDENTIAL	LERCHE MICHAEL	SD-R
78	089B-005400	DB6046 DP929 PB54 PP20	RESIDENTIAL	RUSSELL KAREN KINGSBURY	SD-R
79	089B-005500	DB5747 DP463 PB54 PP20	RESIDENTIAL	THEURER DAVID S	SD-R
80	089B-005600	DB5309 DP243 PB54 PP20	RESIDENTIAL	CREEKSTONE HOMEOWNERS ASSOCIATION IN	SD-R
81	089B-P01500	DB6057 DP780 PB56 PP76	RESIDENTIAL	BARLOW JOHN	SD-R
82	089B-P01600	DB6119 DP165 PB56 PP76	RESIDENTIAL	ERWIN DEVAN A	SD-R
83	089B-P02000	DB6031 DP735 PB56 PP76	RESIDENTIAL	PATEL NIKUNJ M	SD-R
84	089B-P02100	DB5983 DP439 PB56 PP76	RESIDENTIAL	JANI BHAVESHKUMAR	SD-R
85	089B-P02200	DB5989 DP962 PB56 PP76	RESIDENTIAL	HARRIS JOHN	SD-R
86	089B-P02300	DB6003 DP115 PB56 PP76	RESIDENTIAL	LEDGISTER KEVIN ARTHUR	SD-R
87	089B-P02400	DB6377 DP104 PB56 PP76	RESIDENTIAL	JOHANSEN MICHAEL	SD-R
88	089B-P02500	DB5899 DP690 PB56 PP76	RESIDENTIAL	COLLIER EDWARD W III	SD-R

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1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

THE EPOCH DEVELOPMENT

REZONING SUBMITTAL

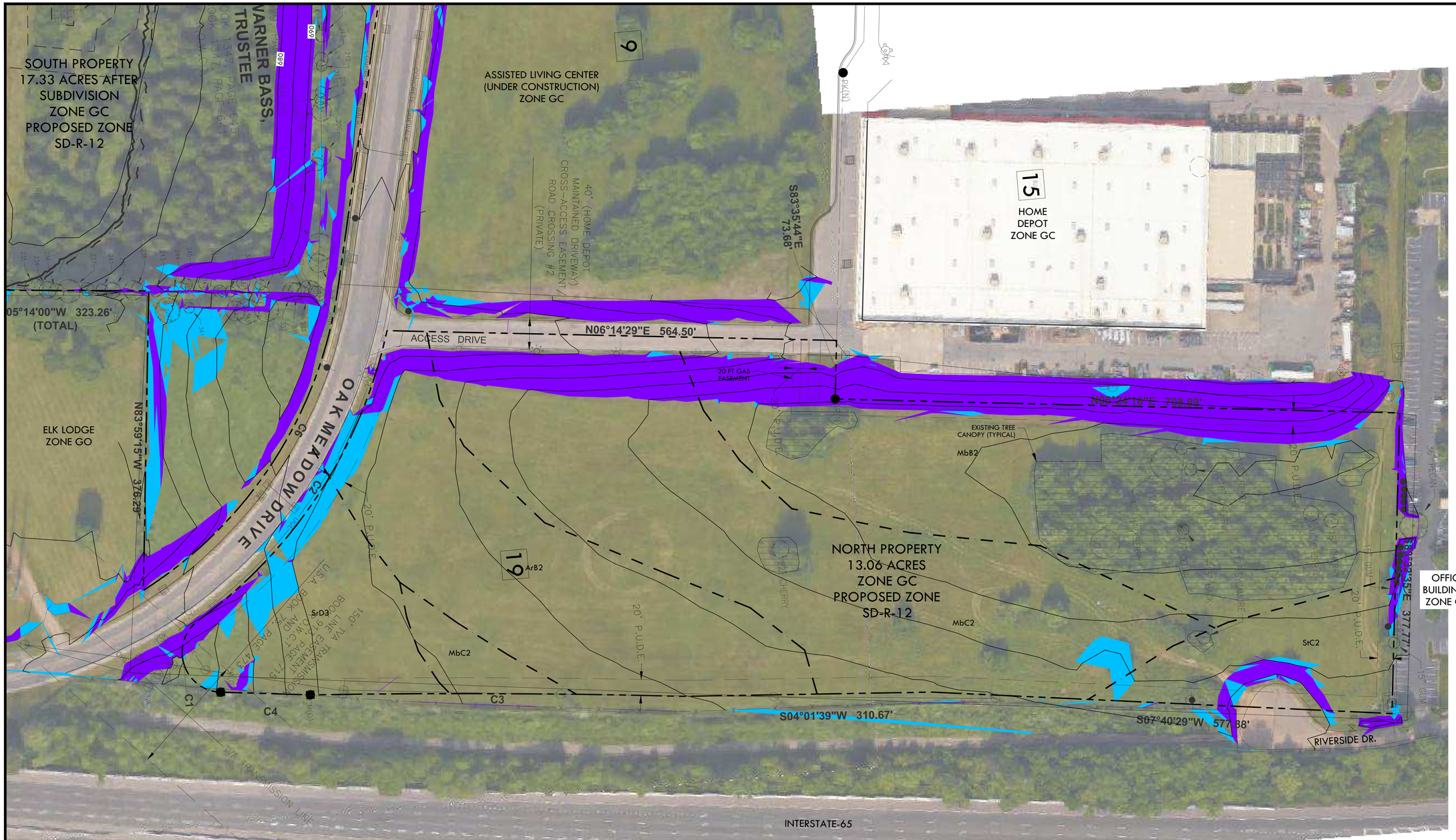
COF #6085 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C1.0

OVERALL EXISTING CONDITIONS PLAN



SLOPE LEGEND

- GREATER THAN 14% AND LESS THAN 20% SLOPE
- GREATER THAN 20% SLOPE

SOIL TYPES

ArB2	Armour silt loam, 2% to 5 % slopes, eroded
CaC2	Captina silt loam, phosphatic, 5% to 12% slopes, eroded
Eg	Egam silt loam, phosphatic
Hu	Huntington silt loam, phosphatic
InE3	Inman silty clay loam, 20% to 30% slopes, severely eroded
MbB2	Maury silt loam, 2% to 5% slopes, eroded
MbC2	Maury silt loam, 5% to 12% slopes, eroded
SrC3	Stiversville clay loam, 5% to 12% slopes, eroded
SrD3	Stiversville clay loam, 12% to 20% slopes, severely eroded
StC2	Stiversville silt loam, 5% to 12% slopes, eroded

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	50.00'	123.89'	141°58'19"	145.10	94.54'	S77°58'06"W
C2	607.96'	443.66'	41°48'42"	232.23	433.88'	N51°57'06"W
C3	11300.00'	470.04'	2°23'00"	235.06	470.01'	S05°13'09"W
C4	11300.00'	112.73'	0°34'18"	56.37	112.73'	S06°41'48"W

0 30 60 120
GRAPHIC SCALE

CRUNK ENGINEERING LLC
1894 GENERAL GEORGE PATTON DR.
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FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

ENGINEERING CRUNK

TODD WILSON CALDWELL — LICENSED LANDSCAPE ARCHITECT — AGRICULTURE — COMMERCE — No. 114180 — STATE OF TENNESSEE — 4/7/16

THE EPOCH DEVELOPMENT

REZONING SUBMITTAL

COF #6085 FRANKLIN, TN

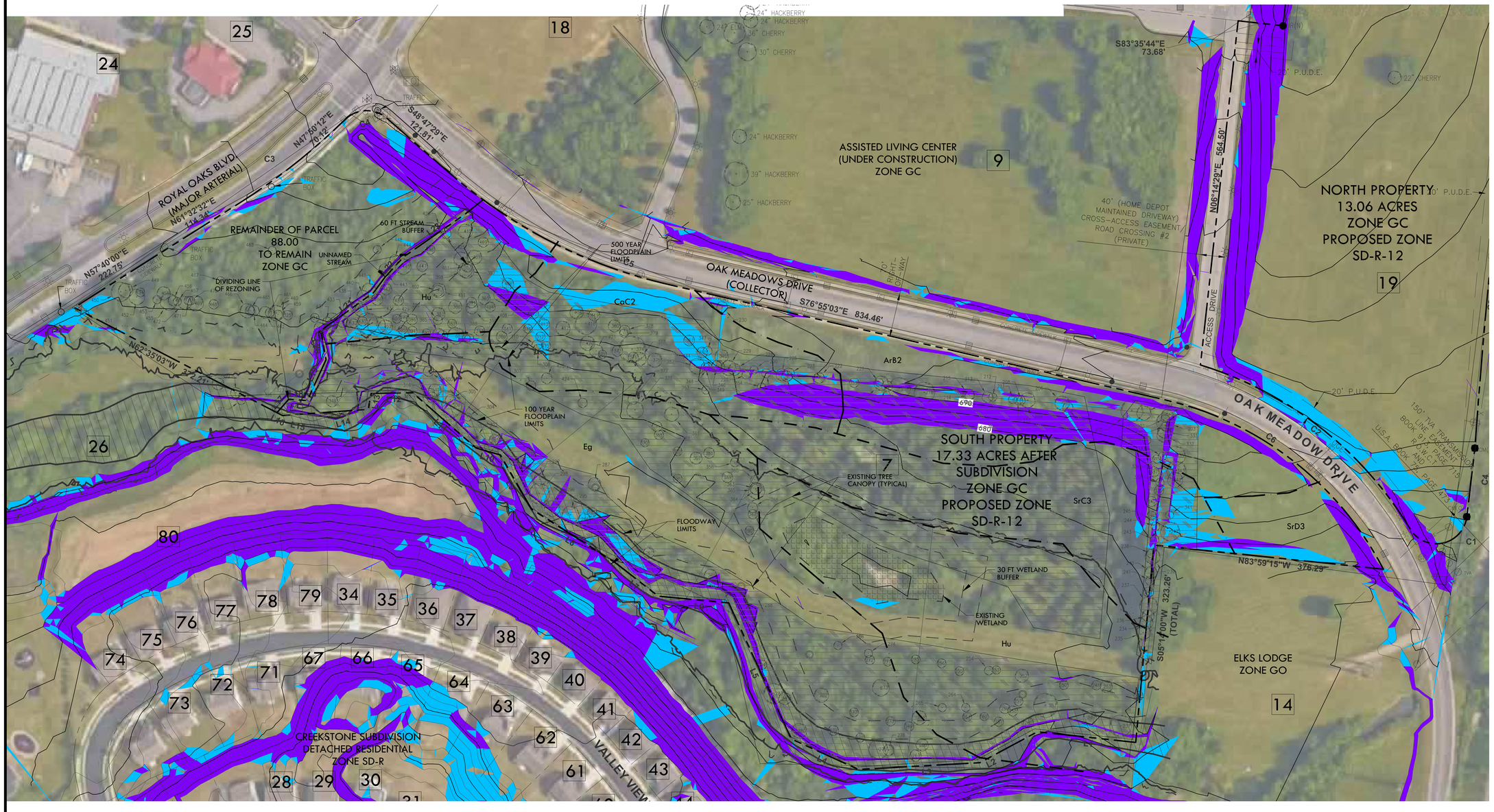
REVISIONS

No.	DATE

04/07/16 15001

C1.1

NORTH SITE EXISTING CONDITIONS PLAN



SLOPE LEGEND

- GREATER THAN 14% AND LESS THAN 20% SLOPE
- GREATER THAN 20% SLOPE

SOIL TYPES

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SrD3	Stiversville clay loam, 12% to 20% slopes, severely eroded
StC2	Stiversville silt loam, 5% to 12% slopes, eroded

0 40 80 160
GRAPHIC SCALE

N

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(615) 873-1795
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CRUNK ENGINEERING

TIMOTHY WILSON CAIN
REGISTERED LANDSCAPE ARCHITECT
AGRICULTURE
COMMERCE
No. 114180
STATE OF TENNESSEE
4/7

THE EPOCH DEVELOPMENT

REZONING SUBMITTAL

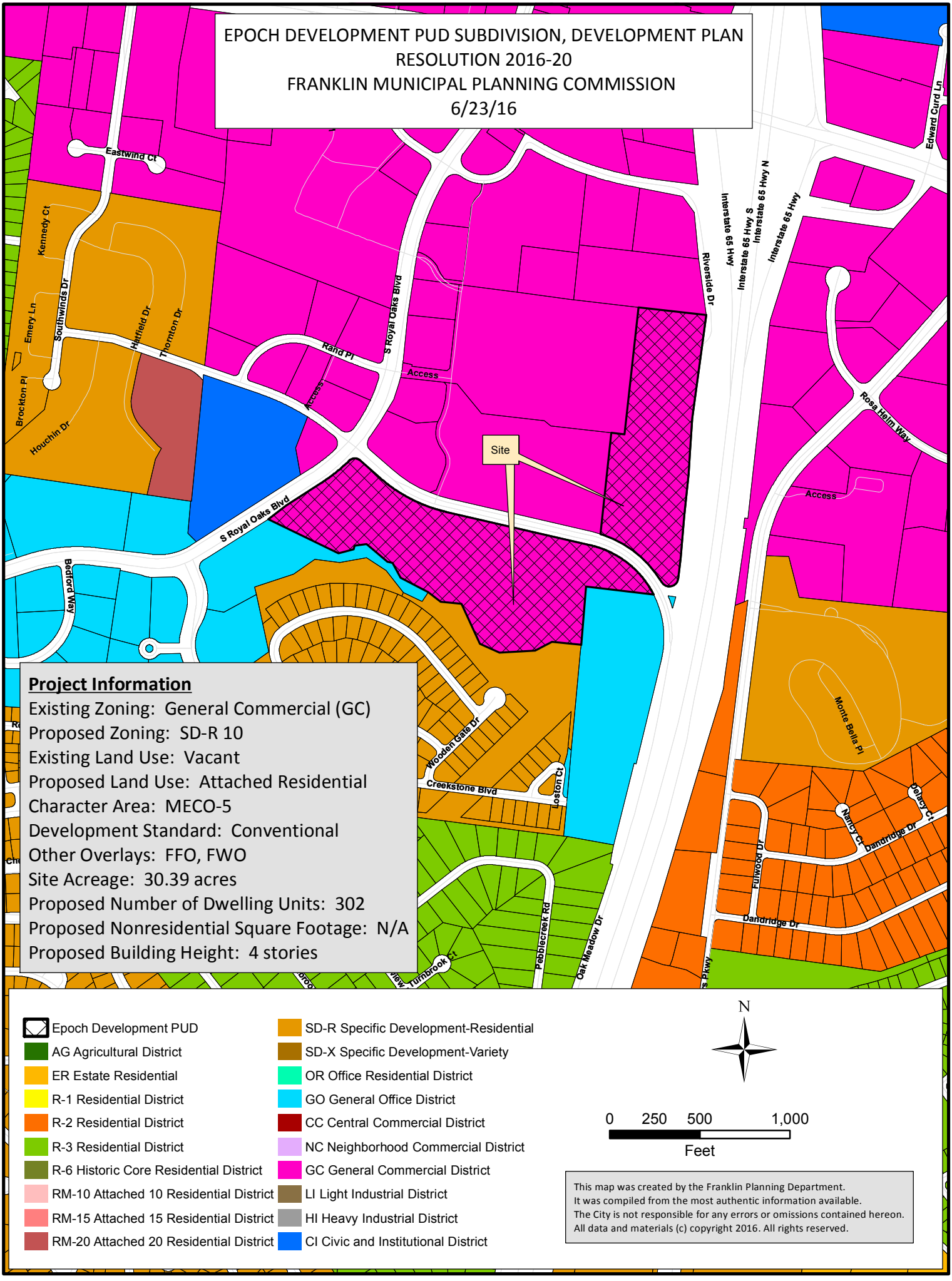
COF #6085 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C1.2

SOUTH SITE EXISTING CONDITIONS PLAN


EPOCH DEVELOPMENT PUD SUBDIVISION, DEVELOPMENT PLAN
RESOLUTION 2016-20
FRANKLIN MUNICIPAL PLANNING COMMISSION
6/23/16
Eastwind Ct
Kennedy Ct
Emery Ln
Southwinds Dr
Hatfield Dr
Thornton Dr
Brockton Pl
Houchin Dr
Rand Pl
S Royal Oaks Blvd
Access
Access
Site
Riverside Dr
Interstate 65 Hwy
Interstate 65 Hwy S
Interstate 65 Hwy N
Interstate 65 Hwy
Edward Curd Ln
Rosa Helm Way
Access
S Royal Oaks Blvd
Bedford Way
Wooden Gate Dr
Creekstone Blvd
Loston Ct
Monte Bella Pl
Nancy Ct
Delacy Ct
Dandridge Dr
Fullwood Dr
Dandridge Dr
Pebblecreek Rd
Oak Meadow Dr
Turnbrook Ct
Project Information
Existing Zoning: General Commercial (GC)
Proposed Zoning: SD-R 10
Existing Land Use: Vacant
Proposed Land Use: Attached Residential
Character Area: MECO-5
Development Standard: Conventional
Other Overlays: FFO, FWO
Site Acreage: 30.39 acres
Proposed Number of Dwelling Units: 302
Proposed Nonresidential Square Footage: N/A
Proposed Building Height: 4 stories
Epoch Development PUD
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0 250 500 1,000
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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COF no: 6086

CONDITIONS OF APPROVAL:

Engineering - 2015 Site Plan Checklist

General Comments

1. C3.0 - Overall Grading & Drainage Plan

- "The previous comment was not completely addressed. These issues must be addressed. Provide the discharge point and the swale or grassy area for the swimming pool discharge. Swimming pool backwash is not permitted to flow into the sewer system or any bioretention or stormwater quality area. Provide the capacity of the downstream stormwater pipes and structures." The pool water discharge must flow into a swale or grassy area. This water must discharge into an area that is easily monitored and does not cause harm to the larger vegetation in the stream buffer or the landscape buffer.

Water/Sewer

2016-05-09 PUD SUBMITTAL - The Epoch Development.pdf

2. Sanitary sewer

- As per our last meeting with the sanitary sewer line being revised the applicant shall show the slopes for the North parcel. A adequate slope is required so as to provide safer conditions for maintenance and the equipment that is needed for maintenance. Applicant shall provide ground profiles for a better understanding of the layout and revise the site to provide safe operation for maintenance to the line.

Zoning

General Comments

3. FFO

- Comment to remain open as general note for project consideration.

RESOLUTION 2016-20

TO BE ENTITLED: "A RESOLUTION APPROVING A DEVELOPMENT PLAN FOR EPOCH DEVELOPMENT PUD SUBDIVISION, FOR THE PROPERTY LOCATED WEST OF INTERSTATE 65, AT 840 AND 880 OAK MEADOW DRIVE."

WHEREAS, the Board of Mayor and Alderman (BOMA) of the City of Franklin, Tennessee, has, or will, approve the zoning for the property as part of Ordinance 2016-008; and

WHEREAS, the Planned Unit Development (PUD) process is a review procedure that is intended to encourage innovative land planning and design and avoid the monotony sometimes associated with large developments by:

(a) Reducing or eliminating the inflexibility that sometimes results from strict application of zoning standards that were designed primarily for individual lots;

(b) Allowing greater freedom in selecting the means to provide access, light, open space, and design amenities;

(c) Encouraging a sensitive design that respects the surrounding established land use character and natural or man-made features of the site including, but not limited to, trees, historic features, streams, hillsides, and floodplains;

(d) Promoting quality design and environmentally sensitive development by allowing development to take advantage of special site characteristics, locations, and land uses; and

(e) Allowing deviations from certain zoning standards that would otherwise apply if not contrary to the general spirit and intent of this ordinance; and

WHEREAS, the PUD process requires the approval of a Development Plan that is reviewed and approved by BOMA, after a public hearing and a recommendation by the Franklin Municipal Planning Commission.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF MAYOR AND ALDERMAN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That the legal description of the property included in the Development Plan is as follows:

PREMISES CONSIDERED

Map-Parcel	Acres
79-88 (portion of)	13.06
79.101.19	17.33
Total	30.39

LOT 24
MAP 79, PORTION OF PARCEL 88.00
SURVEY TRACT 1

A TRACT OF LAND IN THE NINTH CIVIL DISTRICT OF WILLIAMSON COUNTY, CITY OF FRANKLIN, TENNESSEE AND BEING GENERALLY BOUNDED ON THE NORTH BY OAK MEADOW DRIVE, (RIGHT-OF-WAY WIDTH VARIES), ON THE EAST BY NASHVILLE LODGE NO. 72, B.P.O. ELKS,

RECORDED IN DEED BOOK 1708, PAGE 12, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE (R.O.W.C.,T.) ON THE SOUTH BY OPEN SPACE LOT 808 AS SHOWN ON THE PLAN ENTITLED "CREEKSTONE COMMONS, P.U.D SUBDIVISION, SECTION FOUR" OF RECORD IN PLAT BOOK P58, PAGE 10, R.O.W.C.,T. AND LOT 27 AS SHOWN ON THE PLAN ENTITLED "CREEKSTONE COMMONS, REVISION FOUR" OF RECORD IN PLAT BOOK P49, PAGE 110, R.O.W.C.,T. AND ON THE WEST BY THE REMAINDER OF LOT 24 OF FINAL PLAN OF WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, OF RECORD IN PLAT BOOK 29, PAGE 139, R.O.W.C.T AND BEING DESCRIBED ACCORDING TO A SURVEY DATED OCTOBER 15, 2015 AND PREPARED BY KEVIN L. BIRDWELL, R.L.S. NO. 1797 WHOSE ADDRESS IS RAGAN SMITH ASSOCIATES, 315 WOODLAND STREET, NASHVILLE, TN 37206 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING IN THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND BEING THE SOUTH END OF A CURVE AT THE INTERSECTION OF THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND PROCEEDING AS FOLLOWS:

THENCE, WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 72.76 FEET, A CENTRAL ANGLE OF 83 DEGREES 22 MINUTES 19 SECONDS, AND A CHORD BEARING AND DISTANCE OF NORTH 89 DEGREES 31 MINUTES 21 SECONDS EAST, 66.50 FEET TO AN IRON ROD (NEW) WITH CAP STAMPED (RSA) IN THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE;

THENCE, WITH THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE THE FOLLOWING TWO CALLS:

1. SOUTH 48 DEGREES 47 MINUTES 29 SECONDS EAST, 121.81 FEET;
2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 820.00 FEET, AN ARC LENGTH OF 71.61 FEET, A CENTRAL ANGLE OF 05 DEGREES 00 MINUTES 12 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 51 DEGREES 17 MINUTES 35 SECONDS EAST, 71.58 FEET TO AN IRON ROD (NEW) WITH CAP STAMPED (RSA), THE **POINT OF BEGINNING** OF THE HEREIN DESCRIBED TRACT OF LAND AND PROCEEEDING AS FOLLOWS:

THENCE, WITH SAID SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE THE FOLLOWING THREE CALLS:

1. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 820.00 FEET, AN ARC LENGTH OF 330.94 FEET, A CENTRAL ANGLE OF 23 DEGREES 07 MINUTES 24 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 65 DEGREES 21 MINUTES 21 SECONDS EAST, 328.69 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. SOUTH 76 DEGREES 55 MINUTES 03 SECONDS EAST, 834.46 FEET TO AN IRON ROD (NEW)WITH CAP STAMPED (RSA);
3. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 537.96 FEET, AN ARC LENGTH OF 464.57 FEET, A CENTRAL ANGLE OF 49 DEGREES 28 MINUTES 46 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 52 DEGREES 10 MINUTES 40 SECONDS EAST, 450.27 FEET TO AN IRON ROD (NEW)WITH CAP STAMPED (RSA);

THENCE, LEAVING THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND WITH THE NORTH LINE OF THE NASHVILLE LODGE NO. 72, B.P.O. ELKS PROPERTY, NORTH 83 DEGREES 59 MINUTES 15 SECONDS WEST, 376.29 FEET TO A 1/2 INCH DIAMETER IRON ROD (OLD),

THENCE, WITH THE WEST LINE OF THE NASHVILLE LODGE NO. 72, B.P.O. ELKS PROPERTY, SOUTH 05 DEGREES 14 MINUTES 00 SECONDS WEST, PASSING A WITNESS IRON ROD (NEW) ON THE NORTH SIDE OF WATSON BRANCH AT A DISTANCE OF 298.26 AND A TOTAL DISTANCE OF 323.26 FEET TO A POINT IN THE CENTER OF WATSON BRANCH, SAID POINT BEING THE NORTHEAST CORNER OF LOT 808 ON SAID PLAN OF CREEKSTONE COMMONS P.U.D. SUDIVISION, SECTION FOUR;

THENCE, WITH THE CENTERLINE OF WATSON BRANCH AND THE NORTH LINE OF LOT 808 OF SAID CREEKSTONE COMMONS P.U.D. SUBDIVISION, SECTION FOUR AND THE NORTH LINE OF LOT 27 ON SAID PLAN OF CREEKSTONE COMMONS SUBDIVISION, REVISION 4 THE FOLLOWING SIXTEEN BEARINGS AND DISTANCES:

1. NORTH 83 DEGREES 48 MINUTES 10 SECONDS WEST, 161.22 FEET;
2. SOUTH 61 DEGREES 46 MINUTES 08 SECONDS WEST, 106.65 FEET;
3. SOUTH 86 DEGREES 48 MINUTES 30 SECONDS WEST, 198.12 FEET;

4. NORTH 65 DEGREES 28 MINUTES 52 SECONDS WEST, 120.02 FEET;
5. NORTH 24 DEGREES 43 MINUTES 04 SECONDS WEST, 244.21 FEET;
6. NORTH 84 DEGREES 36 MINUTES 00 SECONDS WEST, 115.35 FEET;
7. NORTH 52 DEGREES 04 MINUTES 01 SECONDS WEST, 87.70 FEET;
8. NORTH 57 DEGREES 18 MINUTES 12 SECONDS WEST, 163.19 FEET;
9. NORTH 29 DEGREES 52 MINUTES 55 SECONDS WEST, 101.80 FEET;
10. NORTH 74 DEGREES 02 MINUTES 09 SECONDS WEST, 41.15 FEET;
11. NORTH 48 DEGREES 56 MINUTES 27 SECONDS WEST, 137.25 FEET;
12. SOUTH 88 DEGREES 57 MINUTES 25 SECONDS WEST, 67.60 FEET,
13. SOUTH 10 DEGREES 32 MINUTES 54 SECONDS WEST, 26.12 FEET,
14. SOUTH 74 DEGREES 19 MINUTES 35 SECONDS WEST, 89.75 FEET,
15. NORTH 75 DEGREES 22 MINUTES 06 SECONDS WEST, 55.08 FEET,
16. NORTH 62 DEGREES 35 MINUTES 03 SECONDS WEST, 10.27 FEET,

THENCE, LEAVING WATSON BRANCH WITH A THE CENTERLINE OF A DRAINAGE DITCH AND SEVERING SAID LOT 24 OF FINAL PLAN OF WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, THE FOLLOWING SEVEN BEARINGS AND DISTANCES:

1. NORTH 39 DEGREES 40 MINUTES 55 SECONDS EAST, 27.30 FEET,
2. SOUTH 89 DEGREES 07 MINUTES 57 SECONDS EAST, 31.47 FEET,
3. NORTH 25 DEGREES 32 MINUTES 12 SECONDS EAST, 70.78 FEET,
4. NORTH 10 DEGREES 00 MINUTES 40 SECONDS WEST, 49.37 FEET,
5. NORTH 54 DEGREES 59 MINUTES 41 SECONDS EAST, 103.02 FEET,
6. NORTH 40 DEGREES 36 MINUTES 36 SECONDS EAST, 74.71 FEET,
7. NORTH 53 DEGREES 28 MINUTES 05 SECONDS EAST, 164.68 FEET TO THE POINT OF BEGINNING AND CONTAINING 754,942 SQUARE FEET OR 17.33 ACRES, MORE OR LESS.

and

LOT 32
MAP 79, PARCEL 101.00

A TRACT OF LAND IN THE NINTH CIVIL DISTRICT OF WILLIAMSON COUNTY, CITY OF FRANKLIN, TENNESSEE, AND BEING LOT 32 AS SHOWN ON THE FINAL PLAT ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2, REVISION 1, RESUBDIVISION OF LOT 31” OF RECORD IN PLAT BOOK P62, PAGE 45, REGISTER'S OFFICE FOR WILLIAMSON COUNTY TENNESSEE (R.O.W.C.T.). AND BEING GENERALLY BOUNDED ON THE NORTH BY LOT 10 AS SHOWN ON PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2” OF RECORD IN PLAT BOOK 13, PAGE 85, R.O.W.C.T., ON THE EAST BY RIVERSIDE DRIVE (IMPROVED AND UNIMPROVED ROAD, RIGHT-OF-WAY WIDTH VARIES), ON THE SOUTH BY OAK MEADOW DRIVE (RIGHT-OF-WAY WITH VARIES), AND ON THE WEST BY LOT 2 AS SHOWN ON THE PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, (RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11) OF RECORD IN PLAT BOOK 29, PAGE 139, R.O.W.C.T. AND LOT 31 ON SAID PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2, REVISION 1, RESUBDIVISION OF LOT 31” OF RECORD IN PLAT BOOK P62, PAGE 45, R.OW.C.T., AND BEING DESCRIBED ACCORDING TO A SURVEY DATED OCTOBER 15, 2015 AND PREPARED BY KEVIN L BIRDWELL, R.L.S. NO. 1797 WHOSE ADDRESS IS RAGAN SMITH ASSOCIATES, 315 WOODLAND STREET, NASHVILLE, TN 37206 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT AN IRON ROD (OLD) WITH CAP STAMPED “RAGAN-SMITH ASSOCIATES” (RSA), SAID PIN BEING IN THE EASTERLY RIGHT-OF-WAY OF SOUTH ROYAL OAKS BOULEVARD AND BEING THE NORTH END OF A CURVE AT THE INTERSECTION OF THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND THE NORTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND BEING A WESTERLY CORNER OF LOT 30 OF THE FINAL PLAT ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2 OF RECORD IN PLAT BOOK P43, PAGE 40, R.O.W.C.T.;

THENCE, WITH A CURVE TO THE LEFT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 73.83 FEET, A CENTRAL ANGLE OF 84 DEGREES 35 MINUTES 53 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 06 DEGREES 29 MINUTES 38 SECONDS EAST, 67.30 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA) IN THE NORTHERLY RIGHT-OF-WAY OF OAK MEADOW DRIVE (RIGHT-OF-WAY WIDTH VARIES);

THENCE, CONTINUING WITH SAID RIGHT-OF-WAY AND WITH THE SOUTHERLY LINE OF SAID LOT 30 THE FOLLOWING TWO CALLS:

1. SOUTH 48 DEGREES 47 MINUTES 29 SECONDS EAST, 157.42 FEET IRON ROD (OLD) WITH CAP STAMPED (RSA);

2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 750.00 FEET, AN ARC LENGTH OF 251.97 FEET, A CENTRAL ANGLE OF 19 DEGREES 14 MINUTES 55 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 58 DEGREES 24 MINUTES 57 SECONDS EAST, 250.78 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA) AT THE SOUTHWEST CORNER OF LOT 31 ON THE PLAN ENTITLED "WATSON GLEN SUBDIVISION, SECTION 2, REVISON 1, RESUBDIVISION OF LOT 31" OF RECORD IN PLAT BOOK P62, PAGE 45, R.O.W.C.T.;
THENCE, CONTINUING WITH SAID RIGHT-OF-WAY AND WITH THE SOUTHERLY LINE OF SAID LOT 31 THE FOLLOWING THREE CALLS:
1. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 750.00 FEET, AN ARC LENGTH OF 116.20 FEET, A CENTRAL ANGLE OF 08 DEGREES 52 MINUTES 38 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 72 DEGREES 28 MINUTES 44 SECONDS EAST, 116.09 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. SOUTH 76 DEGREES 55 MINUTES 03 SECONDS EAST, 811.13 FEET TO AN IRON ROD (OLD);
3. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 607.96 FEET, AN ARC LENGTH OF 43.08 FEET, A CENTRAL ANGLE OF 04 DEGREES 03 MINUTES 37 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 74 DEGREES 53 MINUTES 15 SECONDS EAST, 43.07 FEET TO A PK NAIL (OLD) IN THE CENTERLINE OF AN ACCESS DRIVE, THE **POINT OF BEGINNING** OF THE HEREIN DESCRIBED TRACT OF LAND AND PROCEEEDING AS FOLLOWS:
4. THENCE, LEAVING SAID RIGHT-OF-WAY OF OAK MEADOW DRIVE WITH THE CENTERLINE OF SAID ACCESS DRIVE AND THE EAST LINE OF SAID LOT 31 ON THE PLAN ENTITLED "WATSON GLEN SUBDIVISION, SECTION 2, REVISON 1, RESUBDIVISION OF LOT 31" OF RECORD IN PLAT BOOK P62, PAGE 45, R.O.W.C.T.;NORTH 06 DEGREES 14 MINUTES 29 SECONDS EAST, 564.50 FEET TO A PK NAIL (OLD) IN THE SOUTH LINE OF LOT 2 AS SHOWN ON THE PLAN ENTITLED "WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, (RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11);
THENCE, WITH THE SOUTH AND EAST LINE OF SAID LOT 2, THE FOLLOWING TWO BEARINGS AND DISTANCES:
1. SOUTH 83 DEGREES 35 MINUTES 44 SECONDS EAST, 73.68 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. NORTH 06 DEGREES 24 MINUTES 16 SECONDS EAST, 708.89 FEET TO PUNCH HOLE IN A LIGHT BASE IN THE SOUTH LINE OF SAID LOT 10 OF FINAL PLAT ENTITLED "WATSON GLEN SUBDIVISION, SECTION 2";
THENCE, WITH THE SOUTH LINE OF SAID LOT 10, SOUTH 83 DEGREES 32 MINUTES 35 SECONDS EAST, 377.77 FEET TO CONCRETE MONUMENT OLD IN THE WESTERLY RIGHT-OF-WAY OF RIVERSIDE DRIVE (RIGHT-OF-WAY WIDTH VARIES);
THENCE, WITH THE WESTERLY RIGHT-OF-WAY OF RIVERSIDE DRIVE (IMPROVED AND UNIMPROVED ROAD), THE FOLLOWING FOUR CALLS:
1. SOUTH 07 DEGREES 40 MINUTES 29 SECONDS WEST, 577.88 FEET TO AN IRON ROD (OLD);
2. SOUTH 04 DEGREES 01 MINUTES 39 SECONDS WEST, 310.67 FEET TO AN IRON ROD (OLD);
3. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 11300.00 FEET, AN ARC LENGTH OF 470.04 FEET, A CENTRAL ANGLE OF 02 DEGREES 23 MINUTES 00 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 05 DEGREES 13 MINUTES 09 SECONDS WEST, 470.01 FEET TO A CONCRETE MONUMENT (OLD);
4. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 11300.00 FEET, AN ARC LENGTH OF 112.73 FEET, A CENTRAL ANGLE OF 00 DEGREES 34 MINUTES 18 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 06 DEGREES 41 MINUTES 48 SECONDS WEST, 112.73 FEET TO A CONCRETE MONUMENT (OLD);
THENCE, LEAVING SAID RIGHT-OF-WAY OF RIVERSIDE DRIVE AND WITH THE NORTH RIGHT-OF-WAY OF OAK MEADOW DRIVE (RIGHT-OF-WAY WIDTH VARIES) THE FOLLOWING TWO CALLS:
1. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 123.89 FEET, A CENTRAL ANGLE OF 141 DEGREES 58 MINUTES 19 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 77 DEGREES 58 MINUTES 06 SECONDS WEST, 94.54 FEET TO AN IRON ROD (OLD);
2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 607.96 FEET, AN ARC LENGTH OF 443.66 FEET, A CENTRAL ANGLE OF 41 DEGREES 48 MINUTES 42 SECONDS, AND A CHORD BEARING AND DISTANCE OF NORTH 51 DEGREES 57 MINUTES 06 SECONDS WEST, 433.88 FEET TO THE **POINT OF BEGINNING** AND CONTAINING 569,021 SQUARE FEET OR 13.06 ACRES, MORE OR LESS.

SECTION II: That the attached Location Map and Development Plan shall serve the purpose of further delimiting the geographical boundaries as described by this Resolution.

SECTION III: That the overall entitlements for the Epoch Development PUD Subdivision are as follows:

Entitlements	Epoch Development
Base Zone District	SD-R 10.0
Character Area Overlay	MECO-5
Other Zoning Overlays	FFO, FWO
Development Standard	Conventional
Number of Dwelling Units	302
Number of Nonresidential Square Footage	0
Number of Hotel Rooms	0
Connectivity Index	n/a
Open Space Requirements	4.56 acres
Number of Phases in Development	1

SECTION IV: That the Development Plan, the exhibits accompanying the Development Plan, and all conditions and restrictions placed upon the Development Plan by the Franklin Municipal Planning Commission and this Board shall be made a part of this Resolution as though copied verbatim herein, and that a permanent record of the Development Plan, the exhibits accompanying the Development Plan, and all such conditions and restrictions shall be kept in the Franklin Planning and Sustainability Department.

SECTION V. That this Resolution shall take effect from and after its passage on its first and final reading, the health, safety, and welfare of the citizens requiring it.

_____
ERIC S. STUCKEY
City Administrator

_____
DR. KEN MOORE
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

PREAPPLICATION CONFERENCE: _____02/04/16_____

BOMA/FMPC JOINT CONCEPTUAL WORKSHOP: _____02/25/16_____

NEIGHBORHOOD MEETING: _____03/02/16_____

Law Dept. approved 05.23.16

PLANNING COMMISSION RECOMMENDED APPROVAL: _____

PUBLIC HEARING AND BOMA APPROVAL: _____

CREEKSTONE SUBDIVISION CROSS SECTION THROUGH WATSON BRANCH

BRICK TRASH ENCLOSURE EXAMPLE

SITE DATA

PROJECT NAME	THE EPOCH DEVELOPMENT REZONING & PUD APPLICATION
PROJECT NUMBER:	6086
LOTS:	2 EXISTING, 5 PROPOSED
ADDRESS:	840 & 880 OAK MEADOWS DR.
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH
MAP, GROUP AND PARCEL NUMBERS:	MAP 79, PARCELS 88.00 (PORTION OF) & 101.19
EXISTING ZONING:	CC (GENERAL COMMERCIAL)
PROPOSED ZONING:	SD-R (10) (SPECIFIC DEVELOPMENT RESIDENTIAL 10 UNITS/AC)
CHARACTER AREA OVERLAY:	MECO-5
OTHER APPLICABLE OVERLAYS:	FFO & FWO
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	13.06 + 17.33 = 30.39 ACRES
SQUARE FOOTAGE OF SITE:	569,021 + 754,942 = 1,323,963 SQUARE FEET
MINIMUM REQUIRED SETBACK LINES:	ATTACHED RESIDENTIAL USE
YARD FRONTING COLLECTOR (OAK MEADOWS)	40'
SIDE YARD	15'
REAR YARD	30'
OWNER (BOTH PARCELS):	E. WARNER BASS, TRUSTEE
ADDRESS:	150 3RD AVE. SOUTH, SUITE 2800, NASHVILLE, TN 37201
PHONE NO.:	615.742.6400
E-MAIL ADDRESS:	wbass@bassberry.com
CONTACT NAME:	MR. WARNER BASS
MINERAL RIGHTS:	CONTROLLED BY CURRENT PROPERTY OWNER
APPLICANT:	CRUNK ENGINEERING LLC
ADDRESS:	1894 GEN. GEORGE PATTON DR., SUITE 600 FRANKLIN, TN 37067
PHONE NO.:	615.873.1795
E-MAIL ADDRESS:	adam@crunkeng.com
CONTACT NAME:	MR. ADAM CRUNK, P.E.
DENSITY	
ATTACHED DWELLING UNITS	302 UNITS
LAND AREA	30.39 ACRES
LAND AREA WITHIN FLOODPLAIN OVERLAY	8.32 ACRES
OVERALL DENSITY	9.9 UNITS/ACRE
NET DENSITY (MINUS OVERLAY CONSTRAINT)	13.7 UNITS/ACRE
BUILDING HEIGHT	
ALLOWABLE	6 STORIES MAXIMUM
PROPOSED	NORTH PARCEL - 4 STORIES SOUTH PARCEL 2/3 STORIES (2 STORY FACING STREET)
PROPOSED LANDSCAPE SURFACE RATIO:	NORTH SITE - 0.53; SOUTH SITE - 0.76; COMBINED - 0.66
MINIMUM LANDSCAPE SURFACE RATIO:	0.20

PARKING

	NORTH SITE	SOUTH SITE
EXISTING	0	
REQUIRED (1.5/1BR + 2.5/2BR + 3/3BR)		
	1BR - 72 UNITS * 1.5 = 108 SPACES	1BR - 28 UNITS * 1.5 = 42 SPACES
	2BR - 116 UNITS * 2.5 = 290 SPACES	2BR - 50 UNITS * 2.5 = 125 SPACES
	3BR - 16 UNITS * 3.0 = 48 SPACES	3BR - 20 UNITS * 3.0 = 60 SPACES
	TOTAL REQUIRED = 446 SPACES	TOTAL REQUIRED = 227 SPACES
	INCLUDING 9 ADA SPACES	INCLUDING 7 ADA SPACES
MAXIMUM PARKING	NORTH SITE - 536 SPACES;	SOUTH SITE - 273 SPACES

PROPOSED

NORTH SITE		SOUTH SITE	
REGULAR SPACES	430	REGULAR SPACES	186
COMPACT SPACE (0 % OF TOTAL)	0	COMPACT SPACES (14 % OF TOTAL)	31
ADA SPACES	16	ADA SPACES	10
TOTAL PROVIDED	446	TOTAL PROVIDED	227

TREE CANOPY:
SITE HAS BEEN WALKED WITH LARRY MIZZELL TO IDENTIFY TREES TO BE REMOVED. TREE CANOPY REQUIREMENTS WILL BE ADDRESSED AT SITE PLAN REVIEW TO COMPLY WITH ZONING ORDINANCE.

PARKLAND DEDICATION:	FEE IN LIEU OF FOR 4.64 ACRES, 302 TOTAL UNITS PROPOSED
OPEN SPACE:	
TOTAL OPEN SPACE REQ'D (15% OF 30.39 AC.)	4.56 AC.
FORMAL OPEN SPACE REQUIRED (33% OF OPEN SPACE REQUIRED)	1.52 AC. 2.4 AC. PROVIDED
INFORMAL OPEN SPACE REQUIRED (67% OF OPEN SPACE REQUIRED)	3.04 AC. 8.0 AC. PROVIDED
USE BUFFER:	50-FT CLASS C INCOMPATIBLE LAND USE BUFFER (SOUTH PORTION OF SOUTH SITE) 40-FT INTERSTATE BUFFER (EAST PORTION OF NORTH SITE)

PROJECT NOTES:

1) The proposed project complies with the Land Use Plan as it was amended in December 2015 to allow for attached residential uses along with a mixture of other uses. The project is in the McEwen Character Area, Special Area 5. Conventional standards are proposed project since that is the predominant design character of the fully developed surrounding area. The project will remain compatible with its surroundings by proposing two story buildings on the southern site to act as a transition from single family uses to the south and commercial developments to the north. The Northern site will have four story heights to match the adjacent office buildings to the north. The Northern site lends itself to a denser development due to its proximity to the interstate, and surrounding commercial uses.
2) The architectural intent can be best described by the attached elevations proposed for the project. The Southern site intent is to have more of a single family or townhome look. The Northern site intent is to blend with the southern site and new assisted living center that is currently under construction.
3) There are no planned phases of the project. The intent is to begin construction on both parcels at the end of 2016, with the possibility of opening units on the southern property in 2018 and having fully completed the northern property by 2019.

PROPERTY IS LOCATED ON MAP 79 AS A PORTION OF LOT 88.00 AND PARCEL 101.19 CONTAINING 30.39 ACRES.

PARCEL 88.00 DOES LIE WITHIN THE 100-YEAR FLOOD PLAIN AS INDICATED BY FIRM MAP NO. 47187C0212F DATED SEPTEMBER 29, 2006.

STATEMENT OF IMPACT:

The proposed project will add 302 multi-family units. The property is currently undeveloped within the existing City Limits of the City of Franklin. Therefore, no new land is being developed outside the existing jurisdiction of City of Franklin Police, Fire, or Solid Waste services.

The project is approximately a 4 mile driving distance from the Police Station; 1.5 mile driving distance from the nearest fire station on Murfreesboro Rd.
The project will have two dumpster locations for solid waste. One serving 204 units and the other serving 98 units.
No new parkland is being dedicated as part of this project. However, this project will contribute to parkland funds.

0 50 100 150 300
GRAPHIC SCALE

CRUNK ENGINEERING LLC
1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

REVISIONS		
No.	DATE	

06/02/16 15001

C2.0

OVERALL DEVELOPMENT PLAN

FORMAL OPEN SPACE - 0.75 ACRES

FORMAL OPEN SPACE (GRILL) - 0.15 ACRES

TOTAL OF 204 UNITS ON NORTH PARCEL

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	50.00'	123.89'	141°58'19"	145.10	94.54'	S77°58'06"W
C2	607.96'	443.66'	41°48'42"	232.23	433.88'	N51°57'06"W
C3	11300.00'	470.04'	2°23'00"	235.06	470.01'	S05°13'09"W
C4	11300.00'	112.73'	0°34'18"	56.37	112.73'	S06°41'48"W

0 30 60 120
GRAPHIC SCALE

N

CRUNK ENGINEERING LLC
1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

ENGINEERING CRUNK

ALAN WILSON COLE
LICENSED PROFESSIONAL ENGINEER
AGRICULTURE
6/2/16
No. 114180
STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

FRANKLIN, TN

COF #6086

REVISIONS

No.	DATE

06/02/16 15001

C2.1

NORTH SITE DEVELOPMENT PLAN

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N83°48'10"W	161.22'
L2	S61°46'08"W	106.65'
L3	S86°48'30"W	198.12'
L4	N65°28'52"W	120.02'
L5	N24°43'04"W	244.21'
L6	N84°36'00"W	115.35'
L7	N52°04'01"W	87.70'
L8	N57°18'12"W	163.19'
L9	N29°52'55"W	101.80'
L10	N74°02'09"W	41.15'
L11	N48°56'27"W	137.25'
L12	S88°57'25"W	67.60'
L13	S10°32'54"W	26.12'

LINE TABLE		
LINE	BEARING	DISTANCE
L14	S74°19'35"W	89.75'
L15	N75°22'06"W	55.08'
L16	N62°35'03"W	10.27'
L17	N39°40'55"E	27.30'
L18	S89°07'57"E	31.47'
L19	N25°32'12"E	70.78'
L20	N10°00'40"W	49.37'
L21	N54°59'41"E	103.02'
L22	N40°36'36"E	74.71'
L23	N53°28'05"E	164.68'

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C5	820.00'	330.94'	23°07'24"	167.75	328.69'	S65°21'21"E
C6	537.96'	464.57'	49°28'46"	247.89	450.27'	S52°10'40"E

TOTAL OF 98 UNITS ON SOUTH PARCEL

0 40 80 160
GRAPHIC SCALE

N

CRUNK ENGINEERING LLC
1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

ENGINEERING CRUNK

WILSON ... AGRICULTURE ... COMMERCE ... 6/2/16 ... STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

REVISIONS

No.	DATE

06/02/16 15001

C2.2

SOUTH SITE
DEVELOPMENT
PLAN

KENNETH LINEHAN
REGISTERED ARCHITECT
AGRICULTURE
COMMERCE
No. 105419
STATE OF TENNESSEE
2016.05.09

NORTH ELEVATION
(OAK MEADOW DRIVE)

SOUTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

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BUILDING ELEVATIONS

2016-05-09

THE EPOCH DEVELOPMENT

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PROJECT #6068

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COMMERCE
No. 105419
STATE OF TENNESSEE
2016.05.09

SOUTH ELEVATION

GRAPHIC SCALE
16 0 4 8 16
(IN INCHES)
1/16" = 1'-0"

SOUTH PARCEL

PAGE 18
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STATE OF TENNESSEE
2016.05.09

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

ELEVATION

NORTH PARCEL

PAGE 29

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SIDE ELEVATION

NORTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

PAGE 30

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GRAPHIC SCALE

8 0 2 4 8

(IN INCHES)
1/8" = 1'-0"

AMENITY / CLUBHOUSE CENTER
ELEVATION

SOUTH PARCEL

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POOL PAVILION ELEVATION

NORTH PARCEL

GRAPHIC SCALE
8 0 2 4 8
(IN INCHES)
1/8" = 1'-0"

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VIEW LOOKING WEST

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VIEW LOOKING EAST ON OAK MEADOW DR.

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2016.05.09

VIEW LOOKING NORTH

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SITE DATA

PROJECT NAME	THE EPOCH DEVELOPMENT REZONING & PUD APPLICATION
PROJECT NUMBER:	6086
LOTS:	2 EXISTING, 5 PROPOSED
ADDRESS:	840 & 880 OAK MEADOWS DR.
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH
MAP, GROUP AND PARCEL NUMBERS:	MAP 79, PARCELS 88.00 (PORTION OF) & 101.19
EXISTING ZONING:	GC (GENERAL COMMERCIAL)
PROPOSED ZONING:	SD-R (10) (SPECIFIC DEVELOPMENT RESIDENTIAL 10 UNITS/AC)
CHARACTER AREA OVERLAY:	MECO-5
OTHER APPLICABLE OVERLAYS:	FFO & FWO
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	13.06 + 17.33 = 30.39 ACRES
SQUARE FOOTAGE OF SITE:	569,021 + 754,942 = 1,323,963 SQUARE FEET
MINIMUM REQUIRED SETBACK LINES:	ATTACHED RESIDENTIAL USE
YARD FRONTING COLLECTOR (OAK MEADOWS)	40'
SIDE YARD	15'
REAR YARD	30'
OWNER (BOTH PARCELS):	E. WARNER BASS, TRUSTEE
ADDRESS:	150 3RD AVE. SOUTH, SUITE 2800, NASHVILLE, TN 37201
PHONE NO.:	615.742.6400
E-MAIL ADDRESS:	wbass@bassberry.com
CONTACT NAME:	MR. WARNER BASS
MINERAL RIGHTS:	CONTROLLED BY CURRENT PROPERTY OWNER
APPLICANT:	CRUNK ENGINEERING LLC
ADDRESS:	1894 GEN. GEORGE PATTON DR., SUITE 600 FRANKLIN, TN 37067
PHONE NO.:	615.873.1795
E-MAIL ADDRESS:	adam@crunkeng.com
CONTACT NAME:	MR. ADAM CRUNK, P.E.

DENSITY

ATTACHED DWELLING UNITS	302 UNITS
LAND AREA	30.39 ACRES
LAND AREA WITHIN FLOODPLAIN OVERLAY	8.32 ACRES
OVERALL DENSITY	9.9 UNITS/ACRE
NET DENSITY (MINUS OVERLAY CONSTRAINT)	13.7 UNITS/ACRE

BUILDING HEIGHT

ALLOWABLE	6 STORIES MAXIMUM
PROPOSED	NORTH PARCEL - 4 STORIES SOUTH PARCEL 2/3 STORIES (2 STORY FACING STREET)

PROPOSED LANDSCAPE SURFACE RATIO:	NORTH SITE - 0.53; SOUTH SITE - 0.76; COMBINED - 0.66
MINIMUM LANDSCAPE SURFACE RATIO:	0.20

PARKING

EXISTING 0

REQUIRED (1.5/1BR + 2.5/2BR + 3/3BR)

NORTH SITE		SOUTH SITE	
1BR - 72 UNITS * 1.5 =	108 SPACES	1BR - 28 UNITS * 1.5 =	42 SPACES
2BR - 116 UNITS * 2.5 =	290 SPACES	2BR - 50 UNITS * 2.5 =	125 SPACES
3BR - 16 UNITS * 3.0 =	48 SPACES	3BR - 20 UNITS * 3.0 =	60 SPACES
TOTAL REQUIRED	= 446 SPACES	TOTAL REQUIRED	= 227 SPACES
INCLUDING 9 ADA SPACES		INCLUDING 7 ADA SPACES	

MAXIMUM PARKING: NORTH SITE - 536 SPACES; SOUTH SITE - 273 SPACES

PROPOSED

NORTH SITE		SOUTH SITE	
REGULAR SPACES	430	REGULAR SPACES	186
COMPACT SPACE (0 % OF TOTAL)	0	COMPACT SPACES (14 % OF TOTAL)	31
ADA SPACES	16	ADA SPACES	10
TOTAL PROVIDED	446	TOTAL PROVIDED	227

TREE CANOPY:

SITE HAS BEEN WALKED WITH LARRY MIZZELL TO IDENTIFY TREES TO BE REMOVED. TREE CANOPY REQUIREMENTS WILL BE ADDRESSED AT SITE PLAN REVIEW TO COMPLY WITH ZONING ORDINANCE.

PARKLAND DEDICATION: FEE IN LIEU OF FOR 4.64 ACRES, 302 TOTAL UNITS PROPOSED

OPEN SPACE:

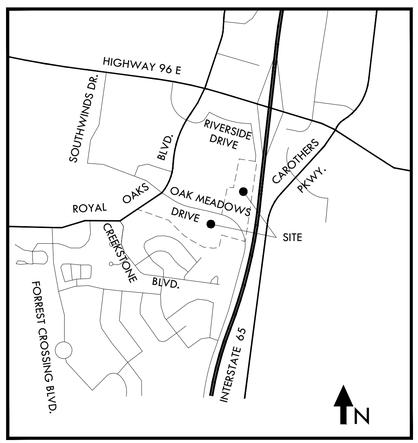
TOTAL OPEN SPACE REQ'D (15% OF 30.39 AC.)	4.56 AC.
FORMAL OPEN SPACE REQUIRED (33% OF OPEN SPACE REQUIRED)	1.52 AC. 2.4 AC. PROVIDED
INFORMAL OPEN SPACE REQUIRED (67% OF OPEN SPACE REQUIRED)	3.04 AC. 8.0 AC. PROVIDED

USE BUFFER: 50-FT CLASS C INCOMPATIBLE LAND USE BUFFER (SOUTH PORTION OF SOUTH SITE)
40-FT INTERSTATE BUFFER (EAST PORTION OF NORTH SITE)

NOTES:

PROPERTY IS LOCATED ON MAP 79 AS A PORTION OF LOT 88.00 AND PARCEL 101.19 CONTAINING 30.39 ACRES.

PARCEL 88.00 DOES LIE WITHIN THE 100-YEAR FLOOD PLAIN AS INDICATED BY FIRM MAP NO. 47187C0212F DATED SEPTEMBER 29, 2006.



VICINITY MAP
NO SCALE

REZONING & PUD

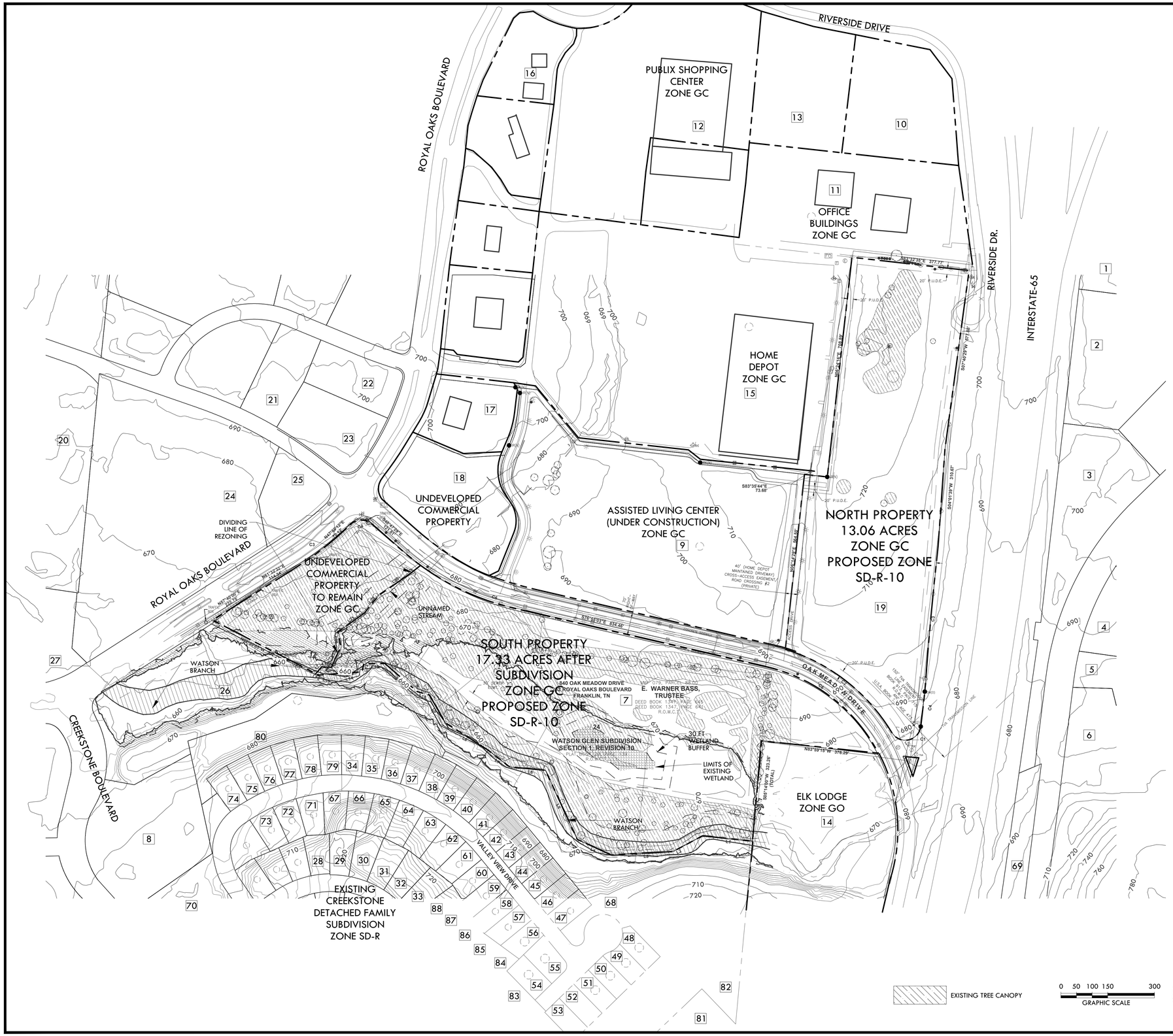
The Epoch Development

PUD SUBDIVISION, DEVELOPMENT PLAN

Franklin, Williamson County, Tennessee

CITY OF FRANKLIN PROJECT NO. 6086

JUNE 2 2016



ID	PRCUID	DEED / PLAT	LAND USE	OWNER	ZONING
1	079---06905	DB 3844 DP 619 PB16 PP114	HOTEL	BRE/LQ PROP LLC	GC
2	079---06906	DB 2966 DP 435 PB22 PP11	AUTO DLR	ADKINS RODNEY G	GC
3	079---07600	DB 4341 DP763 PB22 PP11	CHURCH	CHURCH GATE THE	GC
4	079---08000	DB6337 DP70 PB61 PP69	REC	SOAR ADVENTURE TOWER LLC	GC
5	079---08200	DB5165 DP555	UNDEV.	NICHOLS J DONALD	SD-R
6	079---08300	DB1350 DP525	ATTACHED RESID.	UNITED DOMINION REALTY LP	GC
7	079---08800	DB1347 DP645 PB29 PP139	UNDEV.	BASS E WARNER TR	GC
8	079---10001	DB2192 DP320 PB31 PP125	DAYCARE	WOOD & WOOD LLC	GO
9	079---10100	DB6533 DP243 PB62 PP45	ASST. LVG	DOMINION SENIOR LIVING OF FRANKLIN L	GC
10	079---10101	DB5434 DP660	OFFICE	5107 LLC	GC
11	079---10102	DB2200 DP199 PB19 PP59	OFFICE	UN DON REALTY LLC	GC
12	079---10103	DB5459 DP859 PB99 PP3	RETAIL	PUBLIX TENNESSEE LLC	GC
13	079---10104	DB6168 DP806 PB22 PP120	ASST. LVG	FRANKLIN TN SENIOR CARE PROPERTY LLC	GC
14	079---10105	-	REC	NASHVILLE LODGE #72 BPO ELKS	GO
15	079---10110	DB4406 DP792 PB29 PP139	RETAIL	HD DEVELOPMENT OF MARYLAND INC	GC
16	079---10114	DB5459 DP859 PB29 PP139	RETAIL	PUBLIX TENNESSEE LLC	GC
17	079---10116	DB3792 DP29 PB29 PP139	RETAIL	FIRST-CITIZENS BANK AND TR CO	GC
18	079---10117	PB 43 PP40	UNDEV.	BASS E WARNER TR	GC
19	079---10119	PB 43 PP40	UNDEV.	BASS E WARNER TR	GC
20	079O-A01401	DB4197 DP993 PB41 PP33	UNDEV.	SWI2 TENNESSEE LLC	RM-20
21	079O-A03300	DB4200 DP849 PB27 PP4	INSTIT.	CHURCH CORNERSTONE MINISTRIES INC	GC
22	079O-A03901	DB5790 DP107 PB29 PP10	RETAIL	MAGLI CHERYL S FAMILY TRUST	GC
23	079O-A03902	DB5871 DP528 PB26 PP10	RETAIL	LCJ LLC	GC
24	079O-A04400	DB794 DP881 PB12 PP76		UNITED STATES POSTAL SERV	CI
25	079O-A04401	DB1946 DP286 PB12 PP76	RETAIL	COMMUNITY BANK	GC
26	079O-C02500	DB5136 DP628	UNDEV.	CADENCE BANK NA	GO
27	079O-C02800	PB47 PP142	UNDEV.	ROYAL OAKS PARK SOUTH	GO
28	079O-D00100	DB5814 DP815 PB55 PP146	RESIDENTIAL	THURM DAVID M	SD-R
29	079O-D00200	DB5807 DP985 PB55 PP146	RESIDENTIAL	HAMILTON MALLORY	SD-R
30	079O-D00300	DB4624 DP480 PB55 PP146	RESIDENTIAL	LYLE JORDAN WILLIAM	SD-R
31	079O-D00400	DB5780 DP388 PB55 PP146	RESIDENTIAL	EVANGELISTA BERNARDINO JR	SD-R
32	079O-D00500	DB5841 DP984 PB55 PP146	RESIDENTIAL	CASTANEDA ORESTES	SD-R
33	079O-D00600	DB5809 DP135 PB55 PP146	RESIDENTIAL	VOSS STEPHEN M	SD-R
34	079O-E00100	DB6536 DP138 PB58 PP10	RESIDENTIAL	KHOT SOHAM	SD-R
35	079O-E00200	DB6190 DP252 PB58 PP10	RESIDENTIAL	GOOCH RYAN M	SD-R
36	079O-E00300	DB6218 DP405 PB58 PP10	RESIDENTIAL	SULLIVAN JOHN	SD-R
37	079O-E00400	DB6232 DP972 PB58 PP10	RESIDENTIAL	CULLEN ROBERT BARRY	SD-R
38	079O-E00500	DB6231 DP1 PB58 PP10	RESIDENTIAL	MILLER ROBERT FRANK	SD-R
39	079O-E00600	DB6288 DP734 PB58 PP10	RESIDENTIAL	DHARANI KHAIRUNISSA	SD-R
40	079O-E00700	DB6218 DP407 PB58 PP10	RESIDENTIAL	KNOX CONSUELA S	SD-R
41	079O-E00800	DB6229 DP797 PB58 PP10	RESIDENTIAL	DAWKINS BRETTON GUY	SD-R
42	079O-E00900	DB6296 DP854 PB58 PP10	RESIDENTIAL	COMEAUX MARGARET A	SD-R
43	079O-E01000	DB6273 DP312 PB58 PP10	RESIDENTIAL	SMITH CHRISTOPHER S	SD-R
44	079O-E01100	DB6281 DP281 PB58 PP10	RESIDENTIAL	DANIELS THOMAS	SD-R
45	079O-E01200	DB6541 DP640 PB58 PP10	RESIDENTIAL	SUNDARAM BARATH SHANMUGA	SD-R
46	079O-E01300	DB6331 DP190 PB58 PP10	RESIDENTIAL	HOSSAIN MOHAMMAD	SD-R
47	079O-E01400	DB6264 DP154 PB58 PP10	RESIDENTIAL	MAPLESDEN LAWRENCE	SD-R
48	079O-E01500	DB6346 DP779 PB58 PP10	RESIDENTIAL	BECHARD BRIAN	SD-R
49	079O-E01600	DB6529 DP837 PB58 PP10	RESIDENTIAL	VIDYAM SATHEESH	SD-R
50	079O-E01700	DB6145 DP168 PB58 PP10	RESIDENTIAL	RUSSO JOHN M	SD-R
51	079O-E01800	DB6177 DP164 PB58 PP10	RESIDENTIAL	QUIGLEY J PATRICK	SD-R
52	079O-E01900	DB6151 DP238 PB58 PP10	RESIDENTIAL	BONHAM SYDNEY	SD-R
53	079O-E02000	DB6156 DP254 PB58 PP10	RESIDENTIAL	BURGER JORDAN	SD-R
54	079O-E02100	DB6172 DP871 PB58 PP10	RESIDENTIAL	NOLAN MICHAEL S TRUST	SD-R
55	079O-E02200	DB6195 DP626 PB58 PP10	RESIDENTIAL	PARSI SREEKANTH	SD-R
56	079O-E02300	DB6529 DP771 PB58 PP10	RESIDENTIAL	KOLLI MURALL KRISHNA	SD-R
57	079O-E02400	DB6252 DP619 PB58 PP10	RESIDENTIAL	RAMAN VENKATESH	SD-R
58	079O-E02500	DB6231 DP816 PB58 PP10	RESIDENTIAL	RAJENDRAN THAMIL S	SD-R
59	079O-E02600	DB6195 DP601 PB58 PP10	RESIDENTIAL	DOPPALAPUDI SRIKANTH	SD-R
60	079O-E02700	DB6182 DP362 PB58 PP10	RESIDENTIAL	CHINTAKINDI VARUN K	SD-R
61	079O-E02800	DB6177 DP138 PB58 PP10	RESIDENTIAL	KRISHNAN JAGADEESWARAN	SD-R
62	079O-E02900	DB6152 DP63 PB58 PP10	RESIDENTIAL	MOHAMED ABDUL R J	SD-R
63	079O-E03000	DB6153 DP125 PB58 PP10	RESIDENTIAL	PICHAIMUTHU NARAYANAN	SD-R
64	079O-E03100	DB6160 DP536 PB58 PP10	RESIDENTIAL	ZELLER JAMES S JR	SD-R
65	079O-E03200	DB6583 DP472 PB58 PP10	RESIDENTIAL	MURRAY KIMBERLY	SD-R
66	079O-E03300	DB6172 DP802 PB58 PP10	RESIDENTIAL	ZIPPER NATHAN M	SD-R
67	079O-E03400	DB6154 DP157 PB58 PP10	RESIDENTIAL	VIGIL MARIO G	SD-R
68	079O-E03500	DB6104 DP222 PB58 PP10	RESIDENTIAL	CREEKSTONES HOMEOWNERS ASSOCIATION I	SD-R
69	089---02609	DB1915 DP 891 PB149 P17	RESIDENTIAL	A T & T CORP BY & THROUGH	R-2
70	089B-O04200	DB5309 DP243 PB54 PP20	RESIDENTIAL	CREEKSTONE HOMEOWNERS ASSOCIATION IN	SD-R
71	089B-O04600	DB5727 DP67 PB54 PP20	RESIDENTIAL	BLACKSHER NICOLE E	SD-R
72	089B-O04700	DB6656 DP836 PB54 PP20	RESIDENTIAL	DRUSE JONATHAN	SD-R
73	089B-O04800	DB5674 DP620 PB54 PP20	RESIDENTIAL	KUMAR RATNA	SD-R
74	089B-O05000	DB6412 DP384 PB54 PP20	RESIDENTIAL	BLANKENSHIP JON I	SD-R
75	089B-O05100	DB5710 DP738 PB54 PP20	RESIDENTIAL	BURRELL GERALD MARK	SD-R
76	089B-O05200	DB5716 DP104 PB54 PP20	RESIDENTIAL	BUCKNER RICHARD D	SD-R
77	089B-O05300	DB5604 DP513 PB54 PP20	RESIDENTIAL	LERCHE MICHAEL	SD-R
78	089B-O05400	DB6046 DP929 PB54 PP20	RESIDENTIAL	RUSSELL KAREN KINGSBURY	SD-R
79	089B-O05500	DB5747 DP463 PB54 PP20	RESIDENTIAL	THEURER DAVID S	SD-R
80	089B-O05600	DB5309 DP243 PB54 PP20	RESIDENTIAL	CREEKSTONE HOMEOWNERS ASSOCIATION IN	SD-R
81	089B-P01500	DB6057 DP780 PB56 PP76	RESIDENTIAL	BARLOW JOHN	SD-R
82	089B-P01600	DB6119 DP165 PB56 PP76	RESIDENTIAL	ERWIN DEVAN A	SD-R
83	089B-P02000	DB6031 DP735 PB56 PP76	RESIDENTIAL	PATEL NIKUNJ M	SD-R
84	089B-P02100	DB5983 DP439 PB56 PP76	RESIDENTIAL	JANI BHAVESHKUMAR	SD-R
85	089B-P02200	DB5989 DP962 PB56 PP76	RESIDENTIAL	HARRIS JOHN	SD-R
86	089B-P02300	DB6003 DP115 PB56 PP76	RESIDENTIAL	LEDGISTER KEVIN ARTHUR	SD-R
87	089B-P02400	DB6377 DP104 PB56 PP76	RESIDENTIAL	JOHANSEN MICHAEL	SD-R
88	089B-P02500	DB5899 DP690 PB56 PP76	RESIDENTIAL	COLLIER EDWARD W III	SD-R

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ENGINEERING CRUNK

WILSON COUNTY CERTIFIED AGRICULTURE 6/2 COMMERCE No. 114180 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

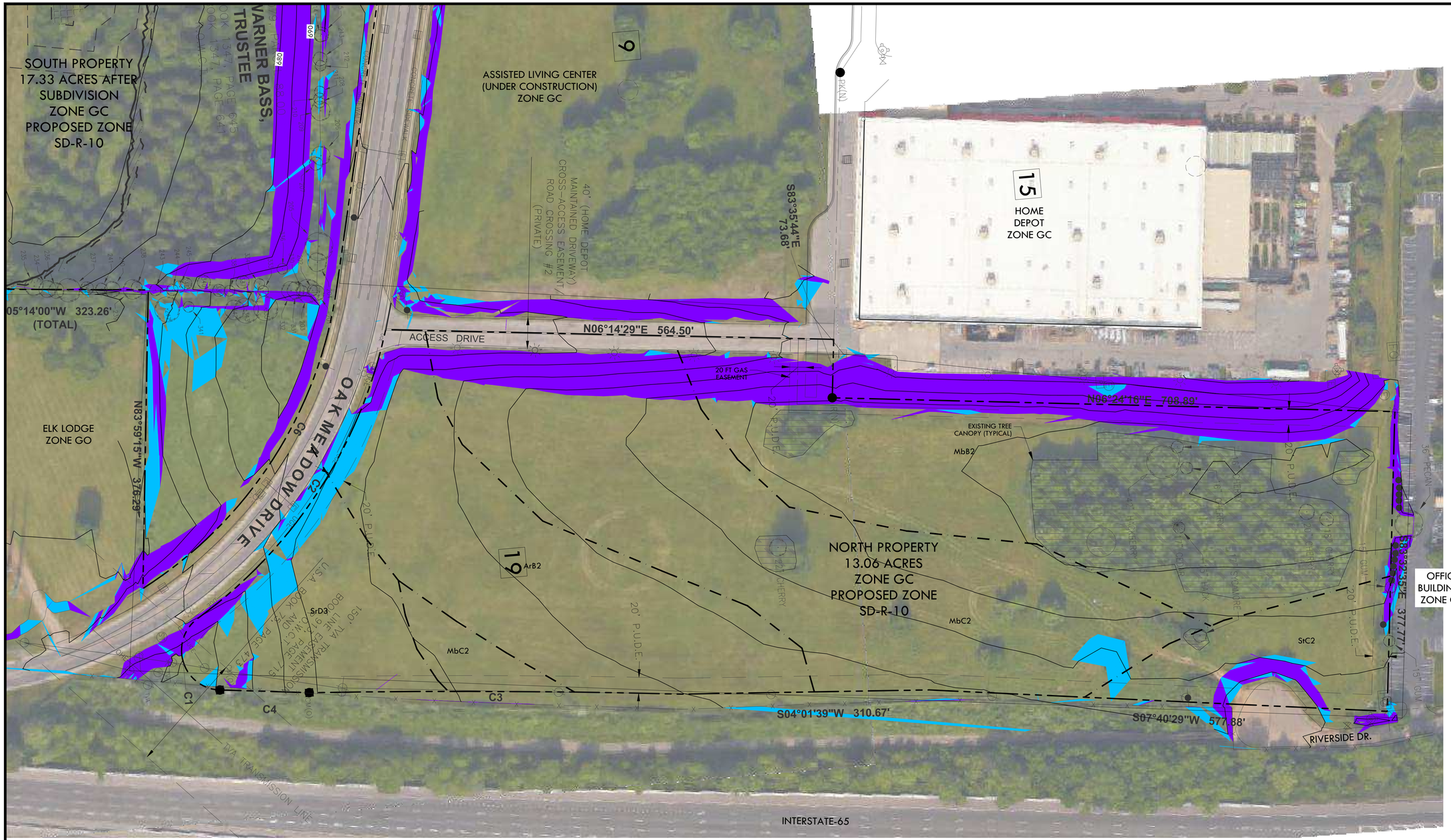
COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

06/02/16 15001

C1.0

OVERALL EXISTING CONDITIONS PLAN



SLOPE LEGEND

- GREATER THAN 14% AND LESS THAN 20% SLOPE
- GREATER THAN 20% SLOPE

SOIL TYPES

ArB2	Armour silt loam, 2% to 5 % slopes, eroded
CaC2	Captina silt loam, phosphatic, 5% to 12% slopes, eroded
Eg	Egam silt loam, phosphatic
Hu	Huntington silt loam, phosphatic
InE3	Inman silty clay loam, 20% to 30% slopes, severely eroded
MbB2	Maury silt loam, 2% to 5% slopes, eroded
MbC2	Maury silt loam, 5% to 12% slopes, eroded
SrC3	Stiversville clay loam, 5% to 12% slopes, eroded
SrD3	Stiversville clay loam, 12% to 20% slopes, severely eroded
StC2	Stiversville silt loam, 5% to 12% slopes, eroded

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	50.00'	123.89'	141°58'19"	145.10	94.54'	S77°58'06"W
C2	607.96'	443.66'	41°48'42"	232.23	433.88'	N51°57'06"W
C3	11300.00'	470.04'	2°23'00"	235.06	470.01'	S05°13'09"W
C4	11300.00'	112.73'	0°34'18"	56.37	112.73'	S06°41'48"W

0 30 60 120
GRAPHIC SCALE

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ENGINEERING CRUNK

WILSON CALDWELL ZALAR — AGRICULTURE — 6/2/16 — No. 114180 — STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

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REVISIONS

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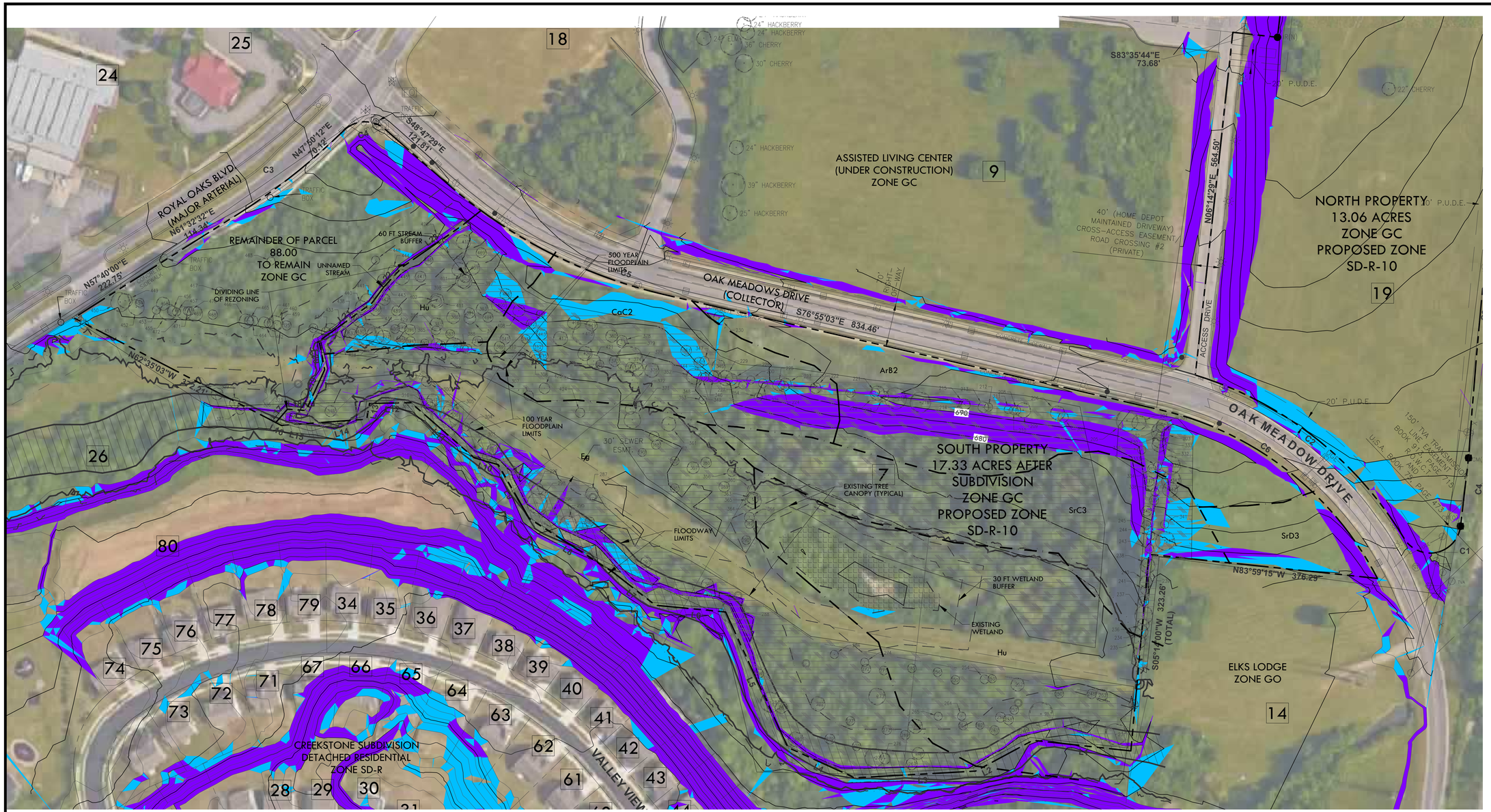
06/02/16 15001

C1.1

NORTH SITE EXISTING CONDITIONS PLAN


ROYAL OAKS BLVD (MAJOR ARTERIAL)
N61°32'32"E 114.34'
N57°40'00"E 222.79'
N47°50'12"E 70.12'
S48°47'29"E 121.81'
REMAINDER OF PARCEL 88.00 TO REMAIN ZONE GC
DIVIDING LINE OF REZONING
UNNAMED STREAM
60 FT STREAM BUFFER
500 YEAR FLOODPLAIN LIMITS
OAK MEADOWS DRIVE (COLLECTOR)
S76°55'03"E 834.46'
ASSISTED LIVING CENTER (UNDER CONSTRUCTION) ZONE GC
9
S83°35'44"E 73.68'
40' (HOME DEPOT MAINTAINED DRIVEWAY) CROSS-ACCESS EASEMENT, ROAD CROSSING #2 (PRIVATE)
N06°14'29"E 564.50'
ACCESS DRIVE
70' RIGHT-OF-WAY
20' P.U.D.E.
NORTH PROPERTY 13.06 ACRES ZONE GC PROPOSED ZONE SD-R-10
19
150' TVA TRANSMISSION LINE EASEMENT BOOK 91 RAW C, PAGE 715 AND BOOK 92 RAW C, PAGE 473
U.S.A. BOOK 92 RAW C, PAGE 473
100 YEAR FLOODPLAIN LIMITS
30' SEWER ESMT.
SOUTH PROPERTY 17.33 ACRES AFTER SUBDIVISION ZONE GC PROPOSED ZONE SD-R-10
7
EXISTING TREE CANOPY (TYPICAL)
FLOODWAY LIMITS
30 FT WETLAND BUFFER
EXISTING WETLAND
N83°59'15"W 376.29'
S05°14'00"W 323.26' (TOTAL)
ELKS LODGE ZONE GO
14
CREEKSTONE SUBDIVISION DETACHED RESIDENTIAL ZONE SD-R
VALLEY VIEW
CaC2
ArB2
Hu
Eg
SrC3
SrD3
24" HACKBERRY
36" CHERRY
30" CHERRY
39" HACKBERRY
25" HACKBERRY
22" CHERRY
TRAFFIC BOX
C1
C2
C3
C4
C6
L1
L2
L3
L4
L5
L6
L7
L8
L9
L10
L11
L12
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1070

CREEKSTONE SUBDIVISION CROSS SECTION THROUGH WATSON BRANCH

BRICK TRASH ENCLOSURE EXAMPLE

SITE DATA

PROJECT NAME	THE EPOCH DEVELOPMENT REZONING & PUD APPLICATION
PROJECT NUMBER:	6086
LOTS:	2 EXISTING, 5 PROPOSED
ADDRESS:	840 & 880 OAK MEADOWS DR.
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH
MAP, GROUP AND PARCEL NUMBERS:	MAP 79, PARCELS 88.00 (PORTION OF) & 101.19
EXISTING ZONING:	CC (GENERAL COMMERCIAL)
PROPOSED ZONING:	SD-R (10) (SPECIFIC DEVELOPMENT RESIDENTIAL 10 UNITS/AC)
CHARACTER AREA OVERLAY:	MECO-5
OTHER APPLICABLE OVERLAYS:	FFO & FWO
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	13.06 + 17.33 = 30.39 ACRES
SQUARE FOOTAGE OF SITE:	569,021 + 754,942 = 1,323,963 SQUARE FEET
MINIMUM REQUIRED SETBACK LINES:	ATTACHED RESIDENTIAL USE
YARD FRONTING COLLECTOR (OAK MEADOWS)	40'
SIDE YARD	15'
REAR YARD	30'
OWNER (BOTH PARCELS):	E. WARNER BASS, TRUSTEE
ADDRESS:	150 3RD AVE. SOUTH, SUITE 2800, NASHVILLE, TN 37201
PHONE NO.:	615.742.6400
E-MAIL ADDRESS:	wbass@bassberry.com
CONTACT NAME:	MR. WARNER BASS
MINERAL RIGHTS:	CONTROLLED BY CURRENT PROPERTY OWNER
APPLICANT:	CRUNK ENGINEERING LLC
ADDRESS:	1894 GEN. GEORGE PATTON DR., SUITE 600 FRANKLIN, TN 37067
PHONE NO.:	615.873.1795
E-MAIL ADDRESS:	adam@crunkeng.com
CONTACT NAME:	MR. ADAM CRUNK, P.E.
DENSITY	
ATTACHED DWELLING UNITS	302 UNITS
LAND AREA	30.39 ACRES
LAND AREA WITHIN FLOODPLAIN OVERLAY	8.32 ACRES
OVERALL DENSITY	9.9 UNITS/ACRE
NET DENSITY (MINUS OVERLAY CONSTRAINT)	13.7 UNITS/ACRE
BUILDING HEIGHT	
ALLOWABLE	6 STORIES MAXIMUM
PROPOSED	NORTH PARCEL - 4 STORIES SOUTH PARCEL 2/3 STORIES (2 STORY FACING STREET)
PROPOSED LANDSCAPE SURFACE RATIO:	NORTH SITE - 0.53; SOUTH SITE - 0.76; COMBINED - 0.66
MINIMUM LANDSCAPE SURFACE RATIO:	0.20

PARKING

	NORTH SITE	SOUTH SITE
EXISTING	0	
REQUIRED (1.5/1BR + 2.5/2BR + 3/3BR)		
	1BR - 72 UNITS * 1.5 = 108 SPACES	1BR - 28 UNITS * 1.5 = 42 SPACES
	2BR - 116 UNITS * 2.5 = 290 SPACES	2BR - 50 UNITS * 2.5 = 125 SPACES
	3BR - 16 UNITS * 3.0 = 48 SPACES	3BR - 20 UNITS * 3.0 = 60 SPACES
	TOTAL REQUIRED = 446 SPACES	TOTAL REQUIRED = 227 SPACES
	INCLUDING 9 ADA SPACES	INCLUDING 7 ADA SPACES
MAXIMUM PARKING	NORTH SITE - 536 SPACES;	SOUTH SITE - 273 SPACES

PROPOSED

NORTH SITE		SOUTH SITE	
REGULAR SPACES	430	REGULAR SPACES	186
COMPACT SPACE (0 % OF TOTAL)	0	COMPACT SPACES (14 % OF TOTAL)	31
ADA SPACES	16	ADA SPACES	10
TOTAL PROVIDED	446	TOTAL PROVIDED	227

TREE CANOPY:
SITE HAS BEEN WALKED WITH LARRY MIZZELL TO IDENTIFY TREES TO BE REMOVED. TREE CANOPY REQUIREMENTS WILL BE ADDRESSED AT SITE PLAN REVIEW TO COMPLY WITH ZONING ORDINANCE.

PARKLAND DEDICATION:	FEE IN LIEU OF FOR 4.64 ACRES, 302 TOTAL UNITS PROPOSED
OPEN SPACE:	
TOTAL OPEN SPACE REQ'D (15% OF 30.39 AC.)	4.56 AC.
FORMAL OPEN SPACE REQUIRED (33% OF OPEN SPACE REQUIRED)	1.52 AC. 2.4 AC. PROVIDED
INFORMAL OPEN SPACE REQUIRED (67% OF OPEN SPACE REQUIRED)	3.04 AC. 8.0 AC. PROVIDED
USE BUFFER:	50-FT CLASS C INCOMPATIBLE LAND USE BUFFER (SOUTH PORTION OF SOUTH SITE) 40-FT INTERSTATE BUFFER (EAST PORTION OF NORTH SITE)

PROJECT NOTES:

1) The proposed project complies with the Land Use Plan as it was amended in December 2015 to allow for attached residential uses along with a mixture of other uses. The project is in the McEwen Character Area, Special Area 5. Conventional standards are proposed project since that is the predominant design character of the fully developed surrounding area. The project will remain compatible with its surroundings by proposing two story buildings on the southern site to act as a transition from single family uses to the south and commercial developments to the north. The Northern site will have four story heights to match the adjacent office buildings to the north. The Northern site lends itself to a denser development due to its proximity to the interstate, and surrounding commercial uses.
2) The architectural intent can be best described by the attached elevations proposed for the project. The Southern site intent is to have more of a single family or townhome look. The Northern site intent is to blend with the southern site and new assisted living center that is currently under construction.
3) There are no planned phases of the project. The intent is to begin construction on both parcels at the end of 2016, with the possibility of opening units on the southern property in 2018 and having fully completed the northern property by 2019.

PROPERTY IS LOCATED ON MAP 79 AS A PORTION OF LOT 88.00 AND PARCEL 101.19 CONTAINING 30.39 ACRES.

PARCEL 88.00 DOES LIE WITHIN THE 100-YEAR FLOOD PLAIN AS INDICATED BY FIRM MAP NO. 47187C0212F DATED SEPTEMBER 29, 2006.

STATEMENT OF IMPACT:

The proposed project will add 302 multi-family units. The property is currently undeveloped within the existing City Limits of the City of Franklin. Therefore, no new land is being developed outside the existing jurisdiction of City of Franklin Police, Fire, or Solid Waste services.

The project is approximately a 4 mile driving distance from the Police Station; 1.5 mile driving distance from the nearest fire station on Murfreesboro Rd.
The project will have two dumpster locations for solid waste. One serving 204 units and the other serving 98 units.
No new parkland is being dedicated as part of this project. However, this project will contribute to parkland funds.

0 50 100 150 300
GRAPHIC SCALE

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THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

REVISIONS		
No.	DATE	

06/02/16 15001

C2.0

OVERALL DEVELOPMENT PLAN

FORMAL OPEN SPACE - 0.75 ACRES

FORMAL OPEN SPACE (GRILL) - 0.15 ACRES

TOTAL OF 204 UNITS ON NORTH PARCEL

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	50.00'	123.89'	141°58'19"	145.10	94.54'	S77°58'06"W
C2	607.96'	443.66'	41°48'42"	232.23	433.88'	N51°57'06"W
C3	11300.00'	470.04'	2°23'00"	235.06	470.01'	S05°13'09"W
C4	11300.00'	112.73'	0°34'18"	56.37	112.73'	S06°41'48"W

0 30 60 120
GRAPHIC SCALE

N

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ENGINEERING CRUNK

ALAN WILSON COLE
LICENSED PROFESSIONAL ENGINEER
AGRICULTURE
6/2/16
No. 114180
STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

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NORTH SITE DEVELOPMENT PLAN

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N83°48'10"W	161.22'
L2	S61°46'08"W	106.65'
L3	S86°48'30"W	198.12'
L4	N65°28'52"W	120.02'
L5	N24°43'04"W	244.21'
L6	N84°36'00"W	115.35'
L7	N52°04'01"W	87.70'
L8	N57°18'12"W	163.19'
L9	N29°52'55"W	101.80'
L10	N74°02'09"W	41.15'
L11	N48°56'27"W	137.25'
L12	S88°57'25"W	67.60'
L13	S10°32'54"W	26.12'

LINE TABLE		
LINE	BEARING	DISTANCE
L14	S74°19'35"W	89.75'
L15	N75°22'06"W	55.08'
L16	N62°35'03"W	10.27'
L17	N39°40'55"E	27.30'
L18	S89°07'57"E	31.47'
L19	N25°32'12"E	70.78'
L20	N10°00'40"W	49.37'
L21	N54°59'41"E	103.02'
L22	N40°36'36"E	74.71'
L23	N53°28'05"E	164.68'

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C5	820.00'	330.94'	23°07'24"	167.75	328.69'	S65°21'21"E
C6	537.96'	464.57'	49°28'46"	247.89	450.27'	S52°10'40"E

TOTAL OF 98 UNITS ON SOUTH PARCEL

0 40 80 160
GRAPHIC SCALE

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THE EPOCH DEVELOPMENT

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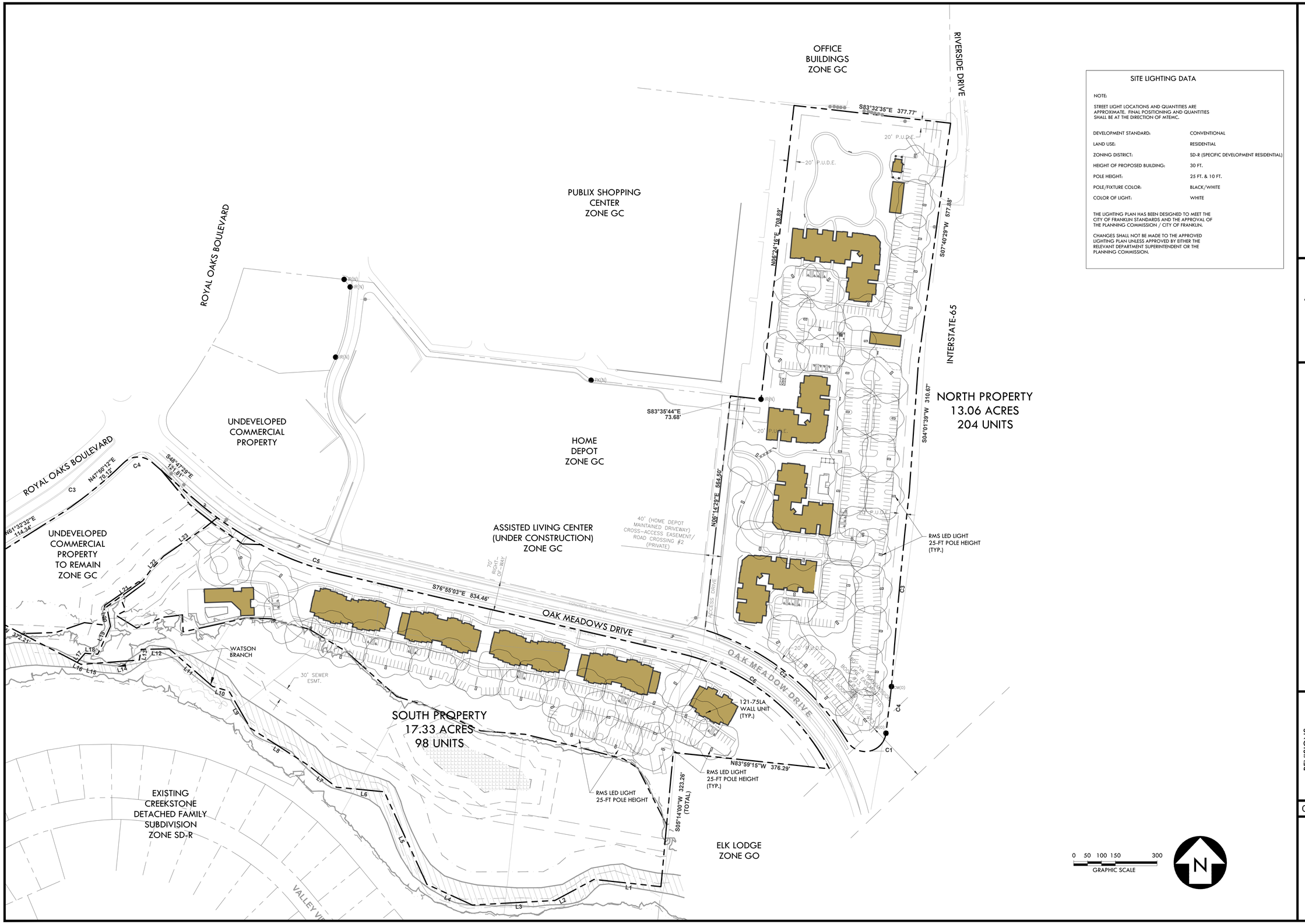
C2.2

SOUTH SITE
DEVELOPMENT
PLAN



SITE LIGHTING DATA

NOTE:

STREET LIGHT LOCATIONS AND QUANTITIES ARE APPROXIMATE. FINAL POSITIONING AND QUANTITIES SHALL BE AT THE DIRECTION OF MTEMC.

DEVELOPMENT STANDARD:	CONVENTIONAL
LAND USE:	RESIDENTIAL
ZONING DISTRICT:	SD-R (SPECIFIC DEVELOPMENT RESIDENTIAL)
HEIGHT OF PROPOSED BUILDING:	30 FT.
POLE HEIGHT:	25 FT. & 10 FT.
POLE/FIXTURE COLOR:	BLACK/WHITE
COLOR OF LIGHT:	WHITE

THE LIGHTING PLAN HAS BEEN DESIGNED TO MEET THE CITY OF FRANKLIN STANDARDS AND THE APPROVAL OF THE PLANNING COMMISSION / CITY OF FRANKLIN.

CHANGES SHALL NOT BE MADE TO THE APPROVED LIGHTING PLAN UNLESS APPROVED BY EITHER THE RELEVANT DEPARTMENT SUPERINTENDENT OR THE PLANNING COMMISSION.

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ENGINEERING CRUNK

WILSON CAIN REGISTERED LANDSCAPE ARCHITECT AGRICULTURE COMMERCE No. 114180 STATE OF TENNESSEE 6/2/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

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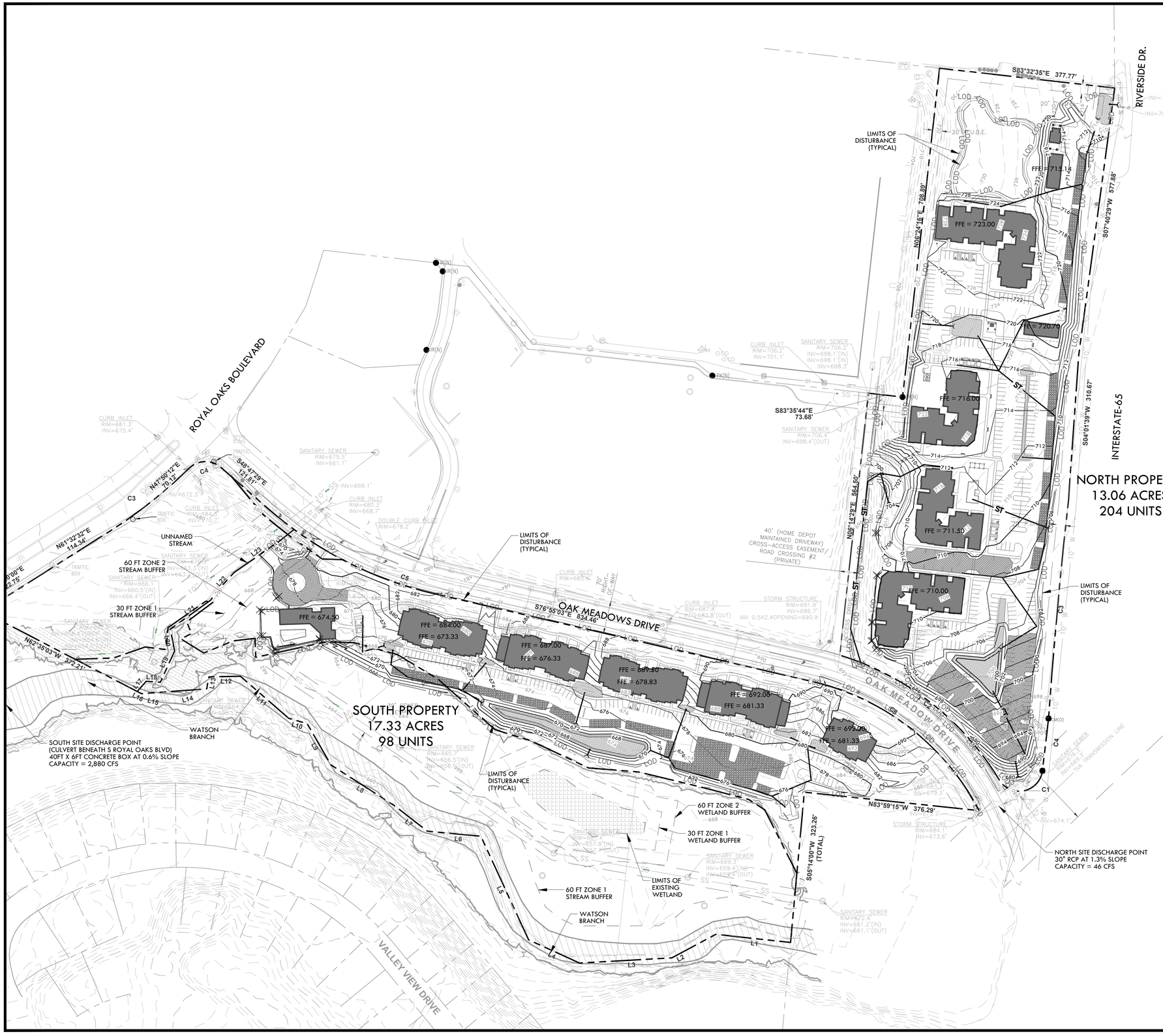
C2.3

GENERAL LIGHTING PLAN



Grading & Drainage General Notes

1. Grading Permit is required for any project disturbing more than 10,000 sf, adding more than 5,000 sf of impervious surface or for any site grading requiring stockpiling of material.
2. The Developer shall provide the necessary labor and supervision required to support field testing by the independent testing firm and inspections by City officials at no cost to the City. Test reports of field testing if applicable shall be submitted directly to the Street Department. Defects disclosed by tests shall be rectified.
3. An authorized representative of the City shall make a final inspection of the project after completion to determine acceptability of the work and for release of performance bonds if required. Before this final inspection can be made, the Engineer responsible for the project shall certify in writing to the City Engineer that the work has been completed in accordance with approved plans and specifications.
4. Drainage facilities including, but not limited to, culverts, detention basins and ditches, as well as the roadway sub-grade, base stone and binder & surface coarse shall be inspected, tested and given approval at each stage of installation prior to proceeding to the next stage of construction. Final construction inspection for approval and acceptance of streets and drainage systems will not be granted until all work has been completed in accordance with the approved
5. Locating and coordination for the relocation of existing utilities is the responsibility of the contractor. Tennessee's One-Call and the City of Franklin utility location service shall be utilized in addition to coordination with local utility owners. The contractor shall at all times protect existing utilities and will be responsible for costs due to damage caused to any utility lines.

STORMWATER NARRATIVE

THE PROPOSED DEVELOPMENT IS DIVIDED INTO TWO SITE AREAS, A 13.06 ACRE NORTH SITE AND A 17.33 ACRE SOUTH SITE. THE NORTH SITE OUTFALLS TO AN EXISTING PIPE IN THE SOUTHEAST CORNER OF THE SITE THAT CROSSES OAK MEADOWS DRIVE TO WATSON BRANCH. THE SOUTH SITE SLOPES TO THE SOUTH INTO WATSON BRANCH WHICH RUNS ALONG THE SOUTHERN PROPERTY LINE. EACH SITE WILL CONTAIN RAIN GARDEN/BIO-RETENTION AREAS THAT WILL TREAT THE NEW IMPERVIOUS AREAS. PERVIOUS PAVEMENT AREAS WILL BE PROVIDED IN DESIGNED LOCATIONS WITHIN THE PARKING LOTS TO PROVIDE ADDITIONAL STORMWATER TREATMENT. THESE AREAS WILL THEN BE ROUTED TO A STORMWATER DETENTION AREA ADJACENT TO THE OUTFALL LOCATIONS FOR BOTH SITED TO ENSURE THE SITE MEETS THE DETENTION REQUIREMENTS.

IMPACT STATEMENT:

THE PROPOSED DEVELOPMENT CONTAINS TWO SITE FEATURES THAT WILL BE PROTECTED DURING CONSTRUCTION. THE SOUTH SITE CONTAINS A WETLAND AREA AS WELL AS A STREAM, WATSON BRANCH. THE SITE HAS BEEN DESIGNED NOT TO IMPACT THESE SITE FEATURES. THE REQUIRED BUFFERS FOR EACH FEATURE HAVE BEEN SHOWN ON THESE PLANS.

GRADING & DRAINAGE DATA CHART

- SITE AREA
  - NORTH = 13.06 AC
  - SOUTH = 17.33 AC
  - TOTAL = 30.39
- IMPERVIOUS AREA
  - NORTH = 5.07 AC
  - SOUTH = 3.36 AC
  - TOTAL = 8.43 AC
- DISTURBED AREA
  - NORTH = 10.0 AC
  - SOUTH = 7.8 AC
  - TOTAL = 17.8 AC
- Rv VALUE = 0.406*
- PEAK FLOW RUNOFF * T.B.D

*PROPOSED DEVELOPMENT WILL COMPLY WITH CITY OF FRANKLIN STORMWATER REQUIREMENTS TO PROVIDE A TREATED Rv VALUE OF LESS THAN OR EQUAL TO 0.200. THE PROPOSED DEVELOPMENT WILL DETAIN THE PEAK FLOWS FOR THE 2 YEAR THROUGH 100 YEAR STROM EVENTS.

STREAM BUFFER NOTE:

THERE SHALL BE NO MOWING, CLEARING, GRADING, CONSTRUCTION, STORAGE, OR DISTURBANCE OF VEGETATION IN RIPARIAN BUFFERS EXCEPT AS PERMITTED BY THE CITY ENGINEER, OR HIS DESIGNEE.

PERVIOUS CONCRETE NOTE:

PERVIOUS CONCRETE INSTALLATION IS TO BE PERFORMED PER ACI522.1-13: SPECIFICATION FOR PERVIOUS CONCRETE PAVEMENT. ALL PERVIOUS CONCRETE MUST BE PLACED AND FINISHED BY A NATIONAL READY MIXED CONCRETE ASSOCIATION (NRMCA)-CERTIFIED PERVIOUS CONCRETE INSTALLER OR CRAFTSMAN. NRMCA-CERTIFIED TECHNICIANS MAY PLACE AND FINISH THE PERVIOUS CONCRETE ONLY UNDER THE DIRECT SUPERVISION OF AN ON-SITE NRMCA-CERTIFIED CRAFTSMAN.

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1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

ENGINEERING CRUNK

STATE OF TENNESSEE — JOSEPH WILSON CRUNK — REGISTERED ENGINEER — AGRICULTURE — COMMERCE — No. 114180 — 6/2/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

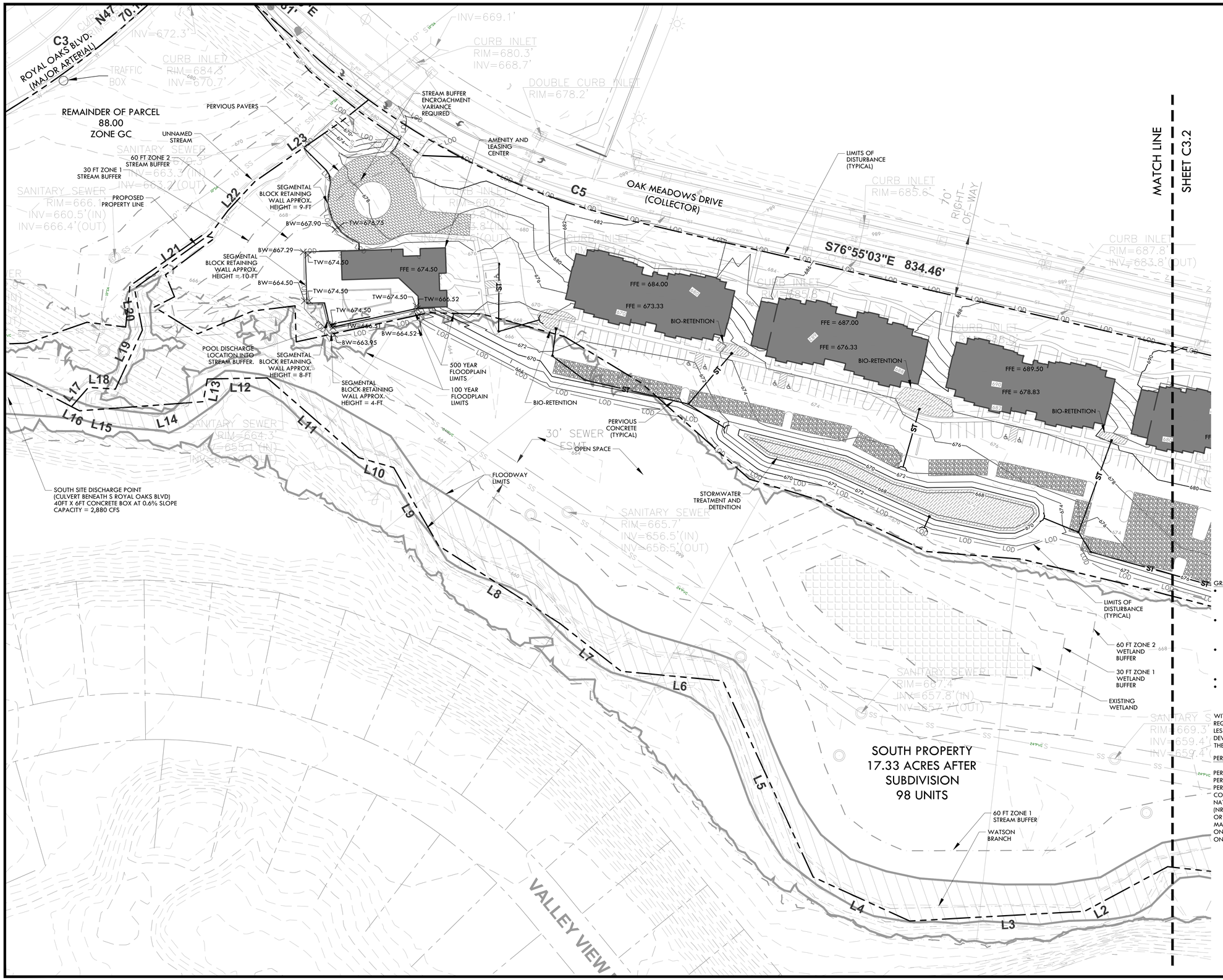
COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

06/02/16 15001

C3.0

OVERALL GRADING PLAN



GRADING & DRAINAGE DATA CHART

- SITE AREA
  - NORTH = 13.06 AC
  - SOUTH = 17.33 AC
  - TOTAL = 30.39
- IMPERVIOUS AREA
  - NORTH = 5.07 AC
  - SOUTH = 3.36 AC
  - TOTAL = 8.43 AC
- DISTURBED AREA
  - NORTH = 10.0 AC
  - SOUTH = 7.8 AC
  - TOTAL = 17.8 AC
- Rv VALUE = 0.406*
- PEAK FLOW RUNOFF * T.B.D

*PROPOSED DEVELOPMENT WILL COMPLY WITH CITY OF FRANKLIN STORMWATER REQUIREMENTS TO PROVIDE A TREATED Rv VALUE OF LESS THAN OR EQUAL TO 0.200. THE PROPOSED DEVELOPMENT WILL DETAIN THE PEAK FLOWS FOR THE 2 YEAR THROUGH 100 YEAR STROM EVENTS.

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CRUNK ENGINEERING

WILSON CAUDLE REGISTERED LANDSCAPE ARCHITECT AGRICULTURE 6/2/16 No. 114180 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

FRANKLIN, TN

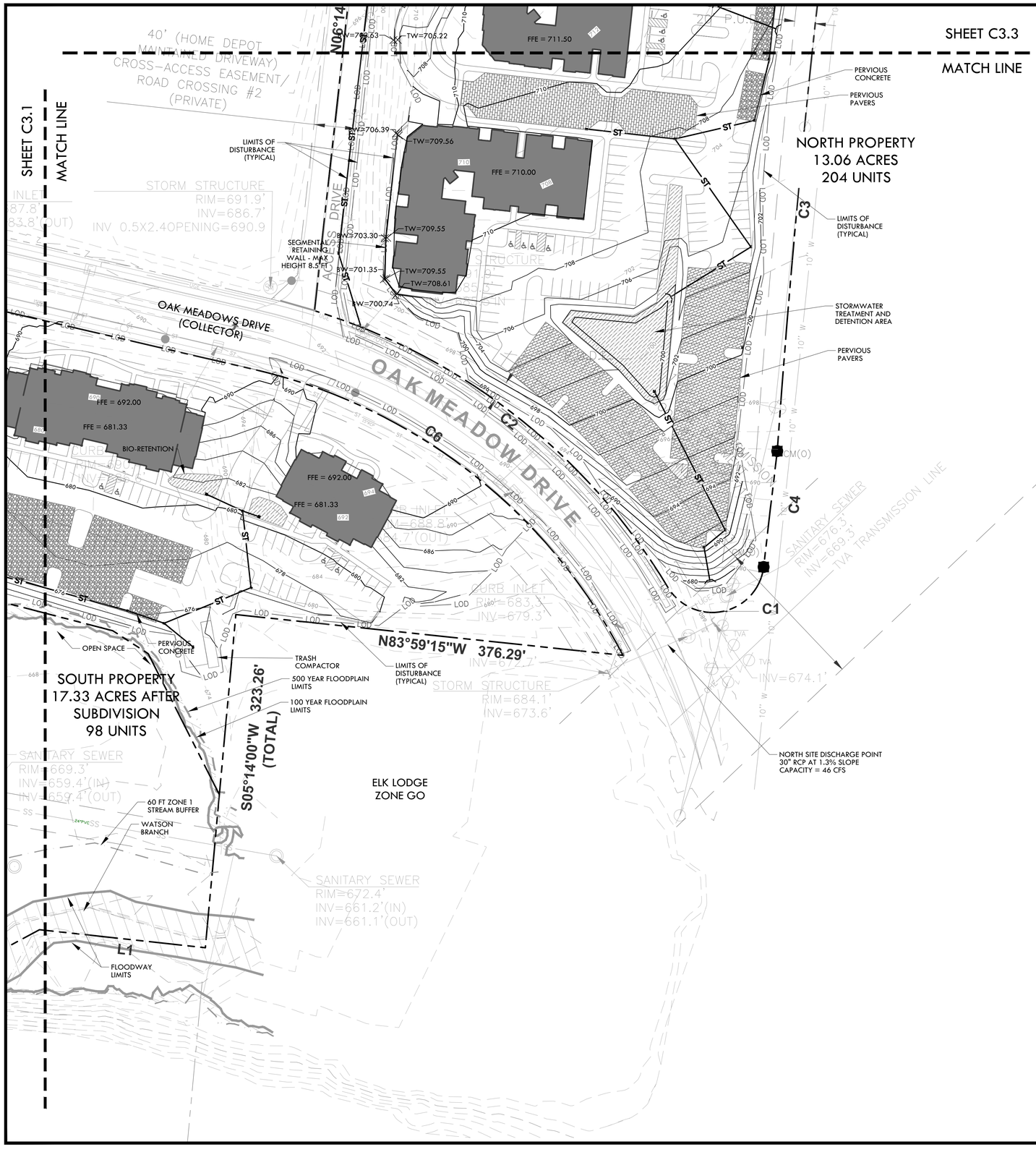
COF #6086

REVISIONS	
No.	DATE

06/02/16 15001

C3.1

SOUTH SITE GRADING PLAN



GRADING & DRAINAGE DATA CHART

- SITE AREA
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  - SOUTH = 17.33 AC
  - TOTAL = 30.39
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  - SOUTH = 3.36 AC
  - TOTAL = 8.43 AC
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  - NORTH = 10.0 AC
  - SOUTH = 7.8 AC
  - TOTAL = 17.8 AC
- Rv VALUE = 0.406*
- PEAK FLOW RUNOFF * T.B.D

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0 10 20 30 40 50 100
GRAPHIC SCALE

N

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ENGINEERING CRUNK

WILSON CAIN REGISTERED LANDSCAPE ARCHITECT AGRICULTURE 6/2/16 COMMERCE No. 114180 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

FRANKLIN, TN

COF #6086

REVISIONS

No.	DATE

06/02/16 15001

C3.2

SOUTH & NORTH SITE GRADING PLAN

GRADING & DRAINAGE DATA CHART

- SITE AREA
  - NORTH = 13.06 AC
  - SOUTH = 17.33 AC
  - TOTAL = 30.39
- IMPERVIOUS AREA
  - NORTH = 5.07 AC
  - SOUTH = 3.36 AC
  - TOTAL = 8.43 AC
- DISTURBED AREA
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0 10 20 30 40 50 100
GRAPHIC SCALE

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ENGINEERING CRUNK

TODD WILSON CARR REGISTERED PROFESSIONAL ENGINEER AGRICULTURE 6/2/16 No. 114180 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

06/02/16 15001

C3.3

NORTH SITE GRADING PLAN

NOTE THAT NO NEW R.O.W. IS PROPOSED FOR THIS PROJECT. REFER TO TRAFFIC STUDY FOR INFORMATION REGARDING L.O.S.

STATEMENT OF IMPACT:
The proposed project will add 302 multi-family units with access along Oak Meadow Drive and Riverside Drive. The primary road corridor serving the project is the major arterial South Royal Oaks Boulevard. Based on the traffic study performed for this project, the majority of traffic will be directed in the northernly direction toward Cool Springs.

R.O.W. & Access General Notes

1. Prior to beginning any construction, the Developer and/or Contractor, shall obtain all necessary permits as required by law. Such permits may include, but are not limited to, those required by State of Tennessee, Williamson County and other City of Franklin agencies.
2. All off-site work within the public right-of-way shall require an approved traffic control plan which complies with the MUTCD. No off-site excavation may be undertaken in any street, road, alley or right-of-way of any utility or temporary construction easement of the City of Franklin by any entity unless 72-hour notice has been given to the City of Franklin Traffic Operations Center. The contractor shall have an approved traffic control plan onsite during construction.
3. Construction materials shall be fully tested in accordance with the designations and requirements within the referenced "TDOT Standard Specifications" sections, unless otherwise noted within the "Standard Specifications" section of the City of Franklin Transportation & Street Technical Standards.
4. An authorized representative of the City shall make a final inspection of the project after completion to determine acceptability of the work and for release of performance bonds if required. Before this final inspection can be made, the Engineer responsible for the project shall certify in writing to the City Engineer that the work has been completed in accordance with approved plans and specifications.
5. Locating and coordination for the relocation of existing utilities is the responsibility of the contractor. Tennessee's One-Call and the City of Franklin utility location service shall be utilized in addition to coordination with local utility owners. The contractor shall at all times protect existing utilities and will be responsible for costs due to damage caused to any utility lines.
6. All temporary striping shall conform to "Standard Specifications for Road and Bridge Construction," published by TDOT, the latest revision except as herein amended. When approved, temporary striping shall be required prior to the opening of a street for travel where pavement and/or permanent striping cannot be completed due to weather and/or time constraints.
7. Thermoplastic pavement markings should be used on all public and private City street projects. Thermoplastic traffic striping and pavement markings shall conform to Section 716.03 "Thermoplastic Pavement Markings", of the Tennessee Department of Transportation Specifications (TDOT), and to the City of Franklin Transportation & Street Technical Standards.

The Epoch Development R.O.W. & Access Data Chart
Daily Trip Generation: 2,360 veh per day
Peak Hour Trip Generation: 145 AM / 143 PM veh per hour
Traffic Impact Study Required: YES
Circulation Plan Required: NO

Access Management
Min. Distance Between Intersection: 600 FT
Min. Distance Between high volume/alleys & Intersections: 300 FT
Min. Distance Between driveway & Intersections: 300 ft
Driveway Width (two-way): 24 ft
Driveway Approach Street Configuration: 15 ft Radius Return or Curb Cut.

FIRE TRUCK TURNING MOVEMENT INFORMATION

Number of Front Axles 1
Front Track Width = 8'
Wheels on Each Front Axle = 2
Number of Rear Axles = 2
Rear Track Width = 8'
Wheel Base = 21.316' (Front Axle to Front Rear Axle)
Rear Axle Spacing = 4.417'
Body Length = 50.0417
Width = 8.333'
Rear Overhang = 22.1424'
Body Style = Fire Truck
Turning Radius Wall to Wall = 42'

ROW ACCESS POINT

0 40 80 160
GRAPHIC SCALE

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ENGINEERING CRUNK

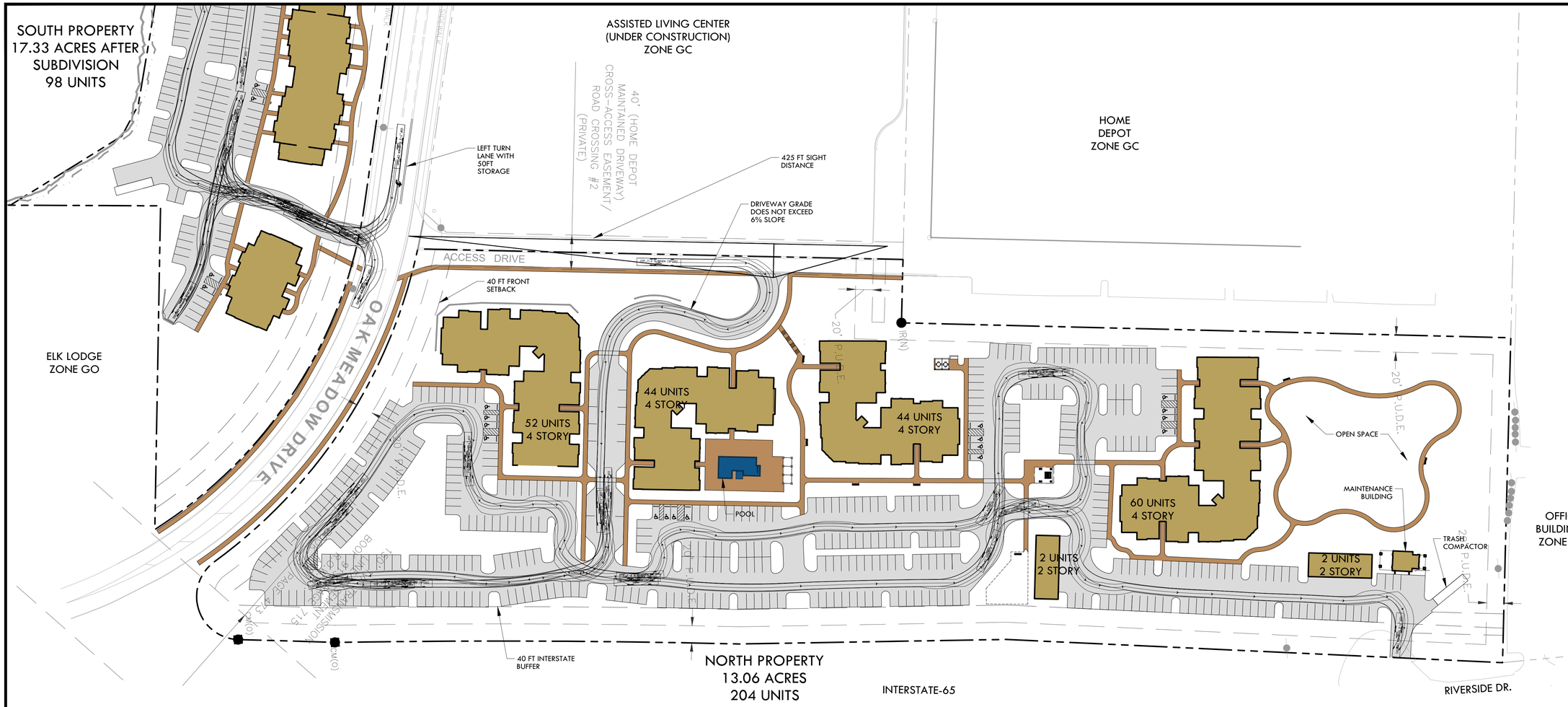
WILSON CAIN — REGISTERED LANDSCAPE ARCHITECT — AGRICULTURE — COMMERCE — No. 114180 — STATE OF TENNESSEE — 6/2/16

THE EPOCH DEVELOPMENT
PUD SUBDIVISION, DEVELOPMENT PLAN
FRANKLIN, TN
COF #6086

REVISIONS		
No.	DATE	

06/02/16 15001

C4.0
OVERALL ACCESS PLAN



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Body Style = Fire Truck
Turning Radius Wall to Wall = 42'

0 30 60 120
GRAPHIC SCALE

N

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WILSON CAIN REGISTERED LANDSCAPE ARCHITECT AGRICULTURE 6/2/16 COMMERCE No. 114180 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

FRANKLIN, TN

COF #6086

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No.	DATE

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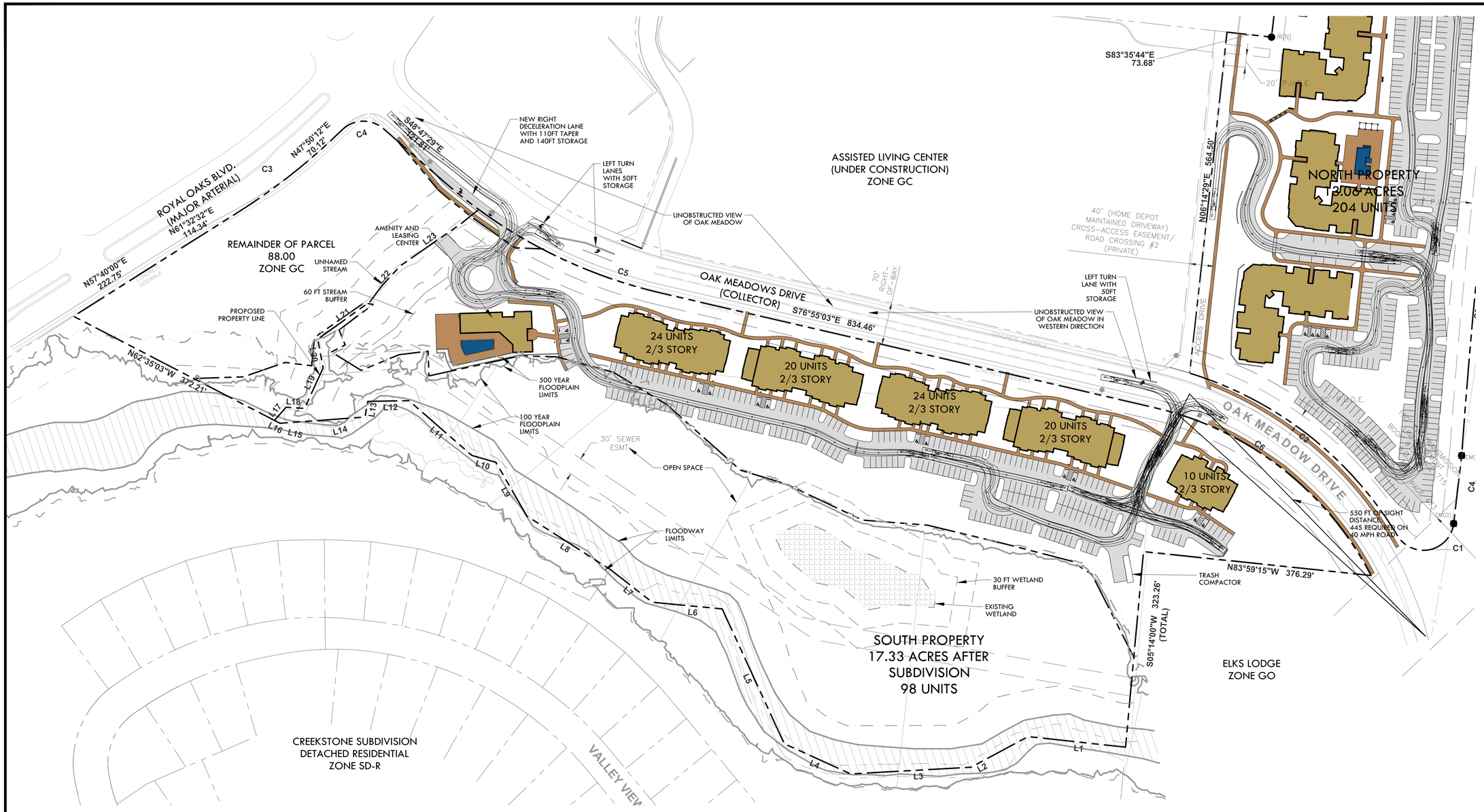
NORTH SITE ACCESS PLAN



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0 40 80 160
GRAPHIC SCALE

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ENGINEERING CRUNK

TENNESSEE WILSON CAMP REGISTERED LANDSCAPE ARCHITECT AGRICULTURE 6/2/16 No. 114180 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

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06/02/16 15001

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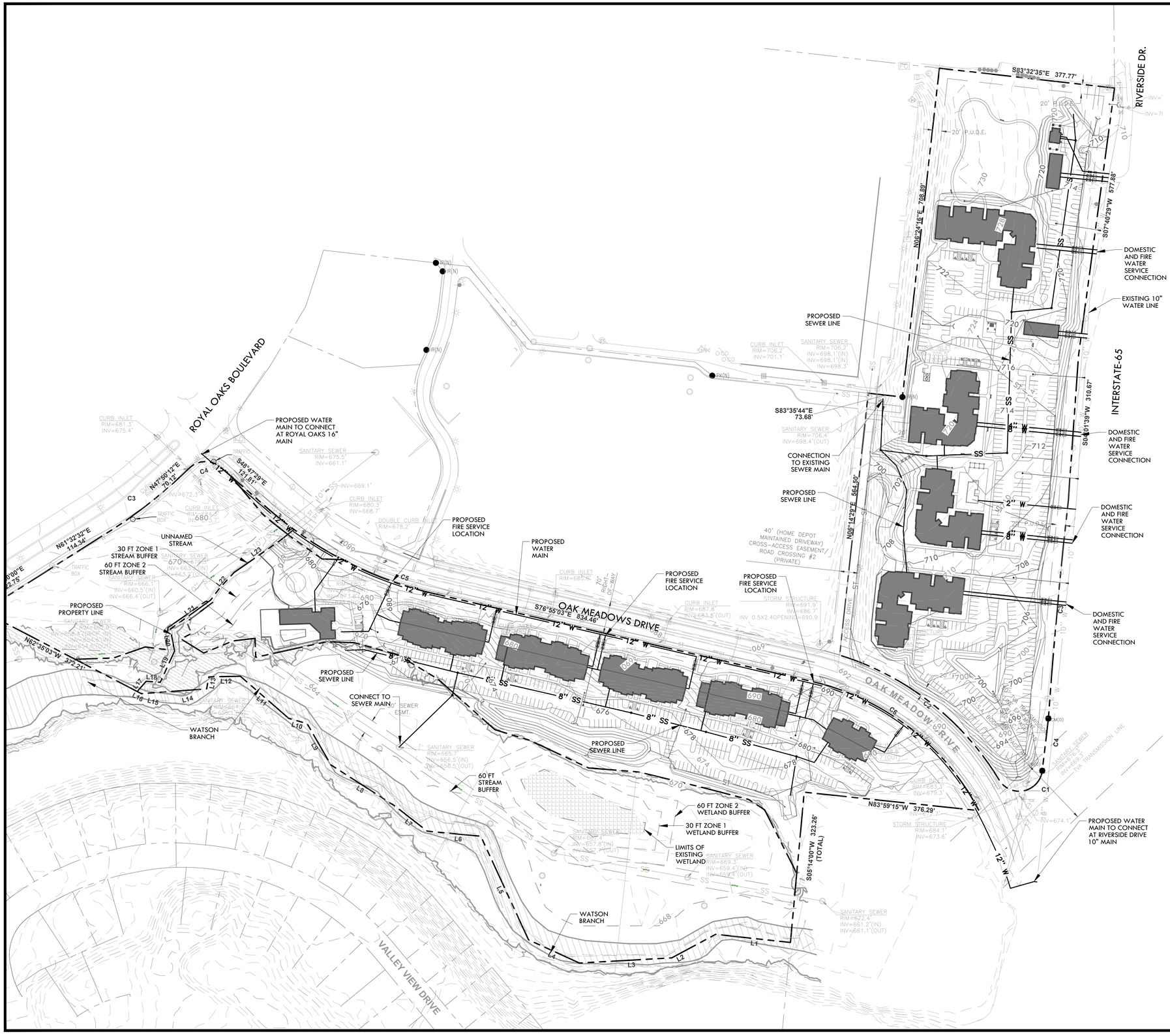
SOUTH SITE ACCESS PLAN



STATEMENT OF IMPACTS

The proposed project is the construction of 302 new attached dwelling units with a mixture of one, two, and three bedroom units. The project will result in a projected flow of 87,400 GPD. The Northern site will be served by water off of the existing 10" main in the old Riverside Drive ROW, and sewer at the existing manhole behind the Home Depot. The Southern site will be served by water with a new 12" main along Oak Meadow Dr. that will connect from Royal Oaks Blvd. and tie into the 10" main along the old Riverside Drive ROW, and sewer will be served by the existing 24" main that runs along Watson Branch on the subject property. Reclaimed water is not located in the project vicinity.

Water & Sewer General Notes

1. All persons who undertake the construction of water, sewer and/or reclaimed water lines located in, or affecting services provided by the City of Franklin shall comply with the requirements and regulations set forth in the "General Requirements & Technical Specifications, Water Management Department, City of Franklin, Tennessee" latest edition, along with any amendments, additions, or alteration that may thereafter be adopted by the board of mayor and aldermen by resolution.
2. Contractor shall obtain Water & Sewer Infrastructure Installation Permit prior to scheduling required Pre-Construction Site Meeting. Contractor shall complete the PreConstruction Site Meeting prior to commencing with construction.
3. Contractor shall obtain and keep all of the following items on the jobsite at all times during construction:
   a. Approved, Stamped and Signed Water and/or Sewer Plans
   b. Water & Sewer Infrastructure Installation Permit, with all steps completed and signed by appropriate City employees.
   c. Copy of approved availability request response letter.
   d. A copy of all approved Cut Sheets.
4. Acceptance of City of Franklin public water infrastructure, sanitary sewer infrastructure and/or reclaimed water infrastructure shall become the responsibility of the City of Franklin, TN following approval from the City of Franklin Inspectors and acceptance by the Franklin Municipal Planning Commission. The Acceptance date shall be based on the day maintenance sureties are established by the Franklin Municipal Planning Commission.
5. Prior to the acceptance of City of Franklin public water infrastructure, sanitary sewer infrastructure and/or reclaimed water infrastructure the contractor shall be required to submit as-built drawings to the Planning and Sustainability Department.
6. All off-site work within the public right-of-way shall require an approved traffic control plan which complies with the MUTCD. No off-site excavation may be undertaken in any street, road, alley or right-of-way of any utility or temporary construction easement of the City of Franklin by any entity unless 72-hour notice has been given to the City of Franklin Traffic Operations Center. The contractor shall have an approved traffic control plan onsite during construction.
7. Any damages caused to existing utilities during construction shall, at his own expense, be replaced or repaired to original condition and quality, as approved by the owner and representative of the appropriate utility company, by the Contractor.
8. The City of Franklin is not a member of TN one call, contractor's responsibility to contact Franklin Water Management, no less than 72 hours prior to commencing work.
   City of Franklin Water Management Contact:
   124 Lumber Dr.
   Franklin, TN 37064
   Attn: Utility Inspector
   (615) 794-4554

WATER & SEWER DATA CHART

Facility Type:	APARTMENTS
Unit Flow in GPD:	250 GPD for 1-bedroom
	300 GPD for 2-bedroom
	350 GPD for 3-bedroom
Number of Units:	100 1-bedroom
	166 2-bedroom
	36 3-bedroom
Total Flow in GPD:	87,400 GPD

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WWW.CRUNKENG.COM

CRUNK ENGINEERING

WILSON CAUDLE REGISTERED LANDSCAPE ARCHITECT AGRICULTURE 6/2/16 COMMERCE No. 114180 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT
PUD SUBDIVISION, DEVELOPMENT PLAN
COF #6086 FRANKLIN, TN

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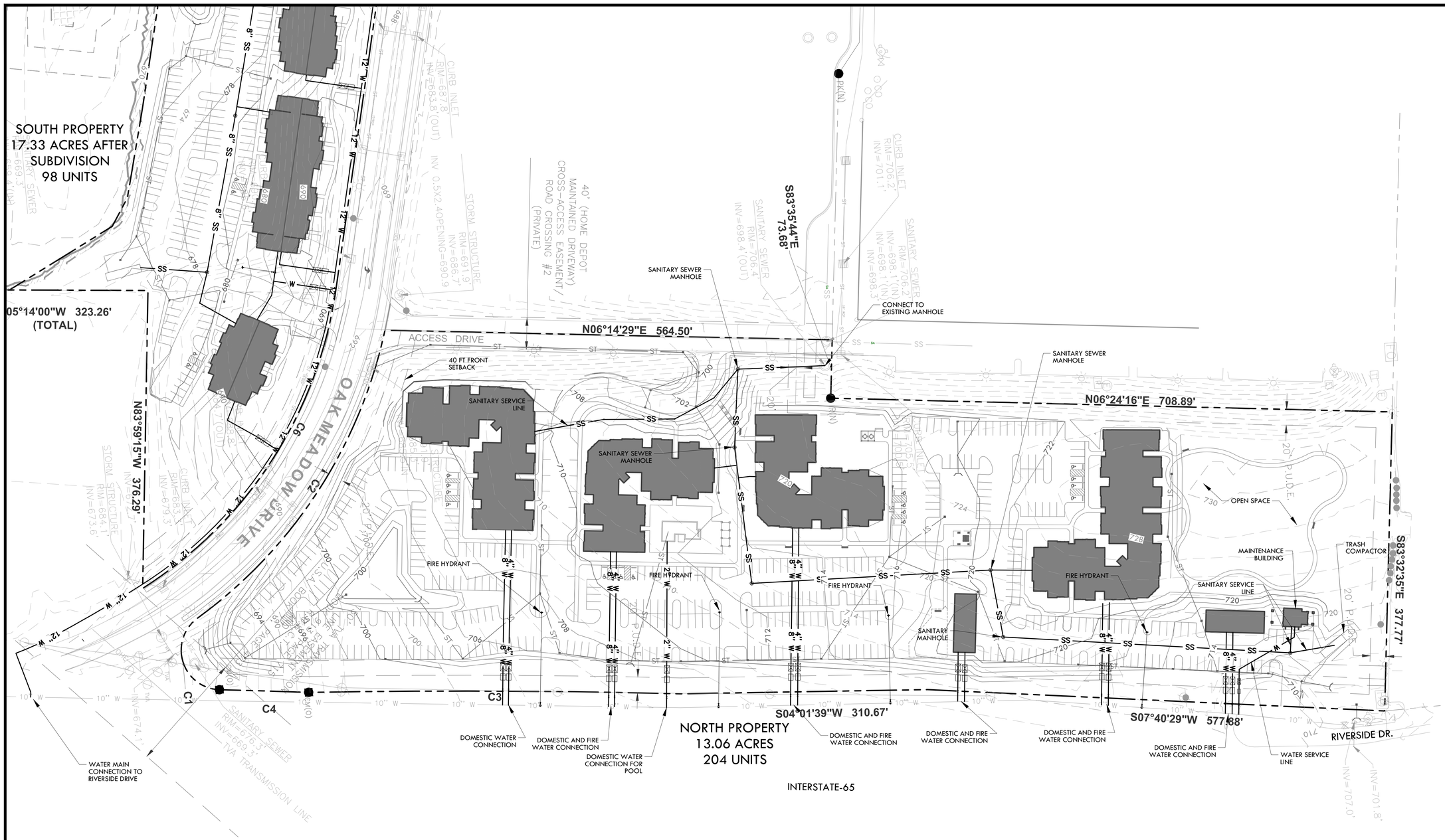
C5.0
OVERALL UTILITY PLAN



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CRUNK ENGINEERING

JEFFREY WILSON CRUNK
REGISTERED
PROFESSIONAL
ENGINEER
AGRICULTURE
6/2/16
COMMERCE
114180
STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

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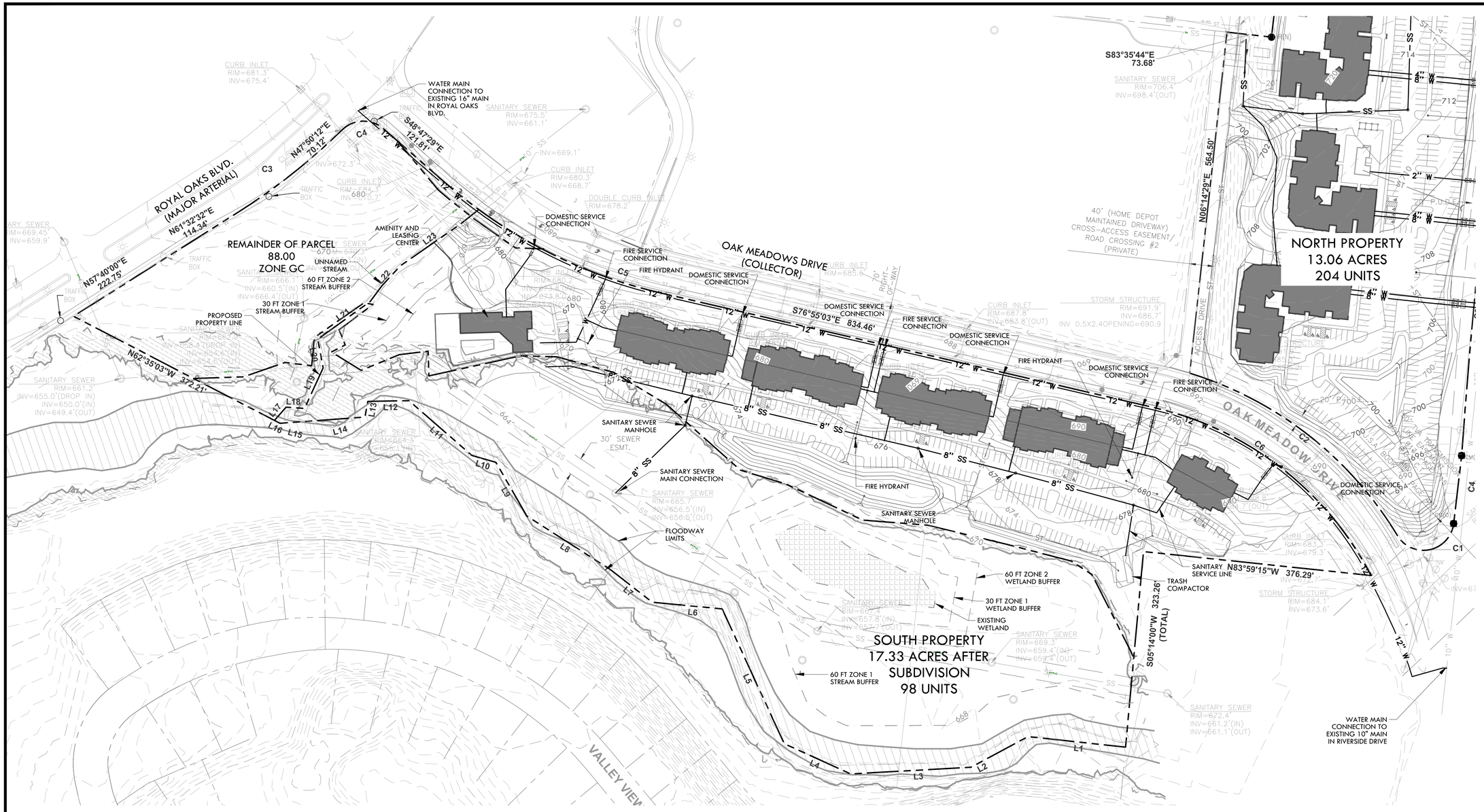
C5.1

NORTH SITE
UTILITY
PLAN



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WILSON CAMPBELL REGISTERED LANDSCAPE ARCHITECT AGRICULTURE 6/2/16 COMMERCE No. 114180 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

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C5.2

SOUTH SITE UTILITY PLAN

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3 BUILDING PLAN - SOUTH PARCEL BLDG S1 GROUND LEVEL
4 BUILDING PLAN - SOUTH PARCEL BLDG S1 SECOND LEVEL
5 BUILDING PLAN - SOUTH PARCEL BLDG S2 LOWER LEVEL
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15 UNIT PLANS - SOUTH PARCEL
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17 BUILDING ELEVATION - SOUTH PARCEL
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32 PAVILION ELEVATION
33 - 45 PROJECT PERSPECTIVES

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF AGRICULTURE
COMMERCE
NO. 105419
STATE OF TENNESSEE
2016.05.09

FUGLEBERG KOCH

EPOCH RESIDENTIAL™

PROJECT #6068

PROJECT COVER SHEET

2016-05-09

THE EPOCH DEVELOPMENT

FRANKLIN, TENNESSEE

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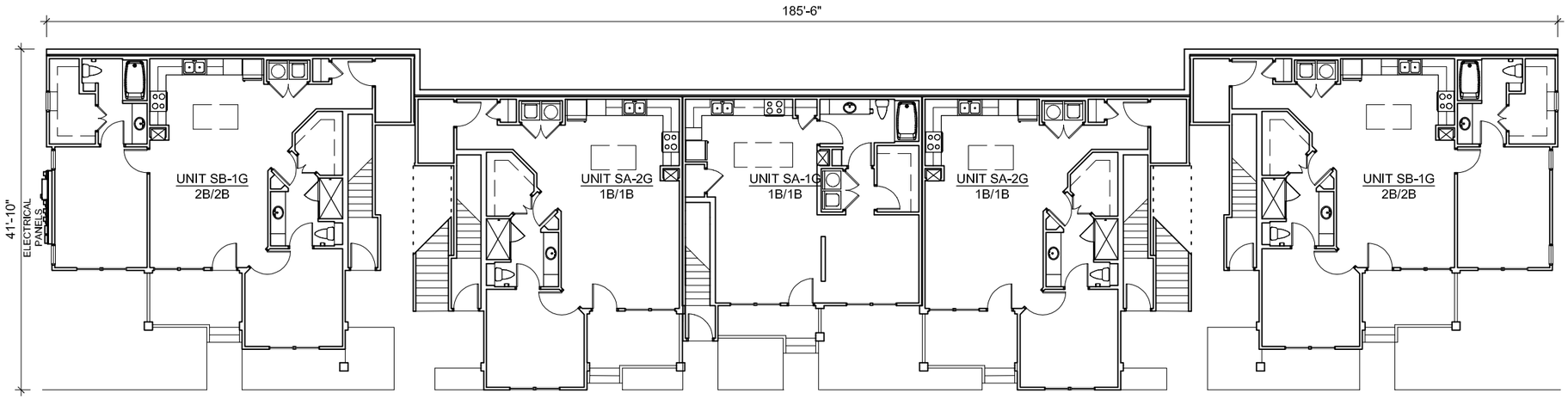
2555 TEMPLE TRAIL WINTER PARK, FLORIDA 32789 TEL: 407-629-0595 FAX: 407-628-1057 LICENSE NO. 3705

AREA

1ST FLOOR:	6,128 SF
2ND FLOOR:	11,961 SF
3RD FLOOR:	9,672 SF
TOTAL:	27,761 SF

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF AGRICULTURE
No. 105419
STATE OF TENNESSEE
2016.05.09



BUILDING TYPE S1 - LOWER FLOOR
(BUILDINGS #1 & #3)

SOUTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

PROJECT #6068

FUGLEBERG KOCH

EPOCH RESIDENTIAL™

BUILDING PLANS
2016-05-09

THE EPOCH DEVELOPMENT
FRANKLIN, TENNESSEE

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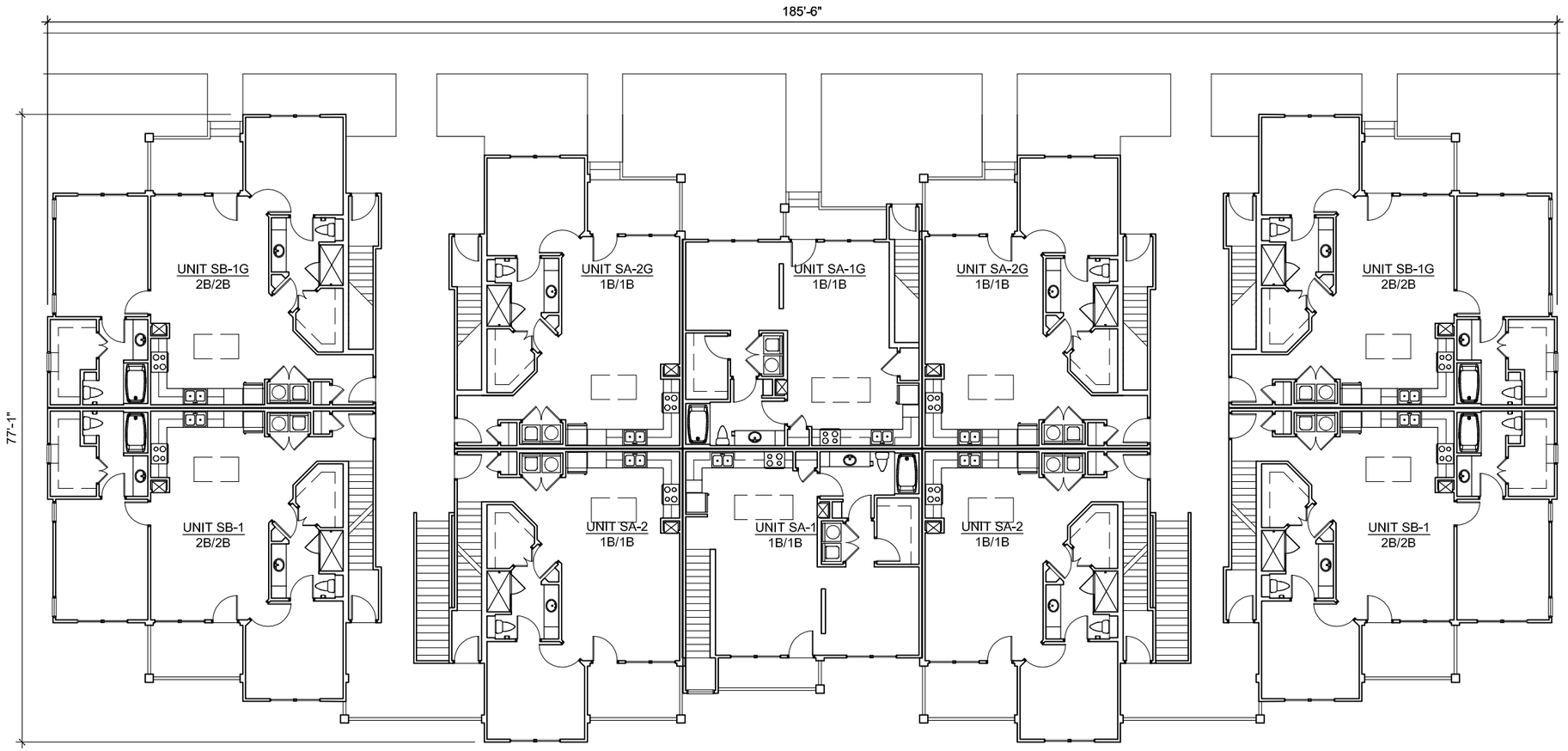

BUILDING TYPE S1 - GROUND FLOOR
(BUILDINGS #1 & #3)

SOUTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF AGRICULTURE
No. 105419
STATE OF TENNESSEE
2016.05.09

PROJECT #6068

FUGLEBERG KOCH

EPOCH RESIDENTIAL™

BUILDING PLANS
2016-05-09

THE EPOCH DEVELOPMENT
FRANKLIN, TENNESSEE

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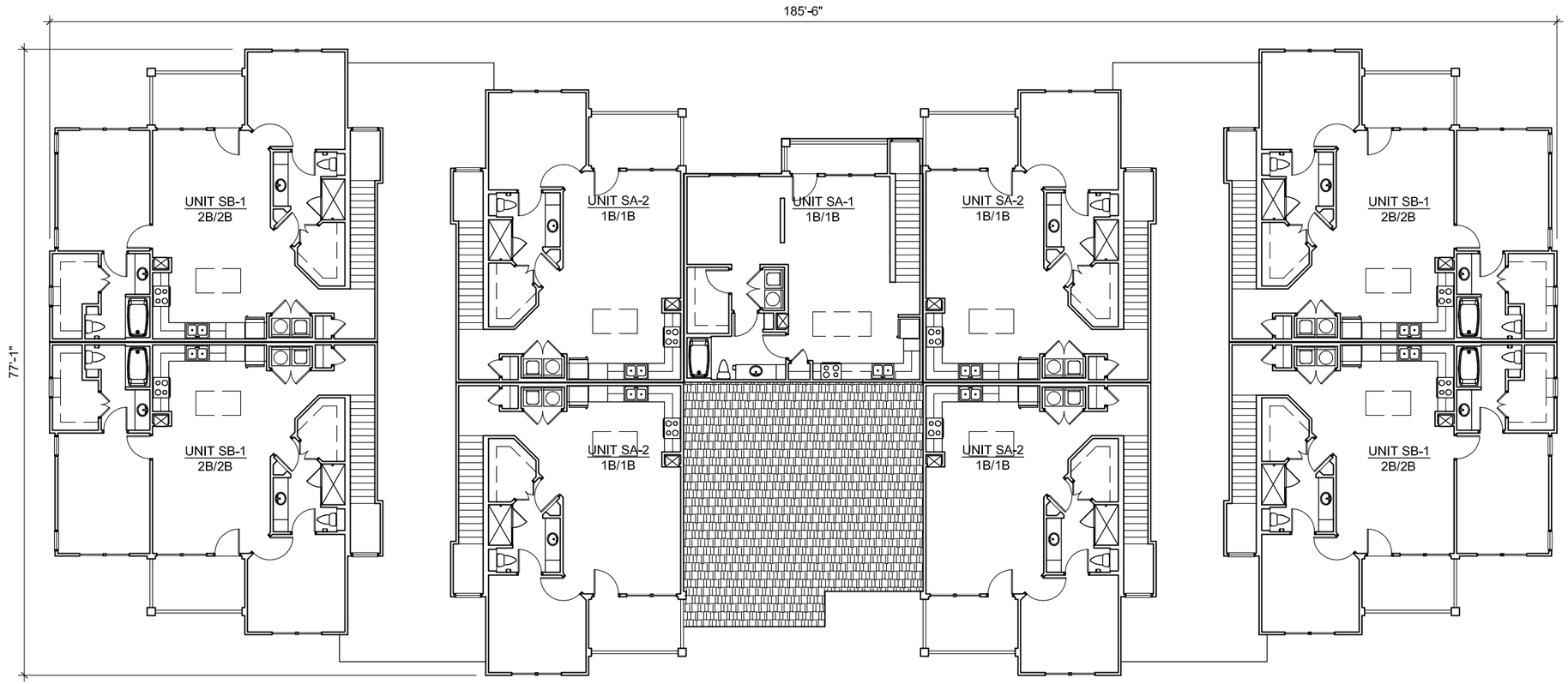
2555 TEMPLE TRAIL WINTER PARK, FLORIDA 32789 TEL: 407-629-0595 FAX: 407-628-1057 LICENSE NO. 3705

AREA

1ST FLOOR:	6,128 SF
2ND FLOOR:	11,961 SF
3RD FLOOR:	9,672 SF
TOTAL:	27,761 SF

KENNETH LINEHAN
REGISTERED ARCHITECT
AGRICULTURE
COMMERCE
No. 105419
STATE OF TENNESSEE
2016.05.09



BUILDING TYPE S1 - SECOND FLOOR
(BUILDINGS #1 & #3)

SOUTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

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BUILDING PLANS
2016-05-09

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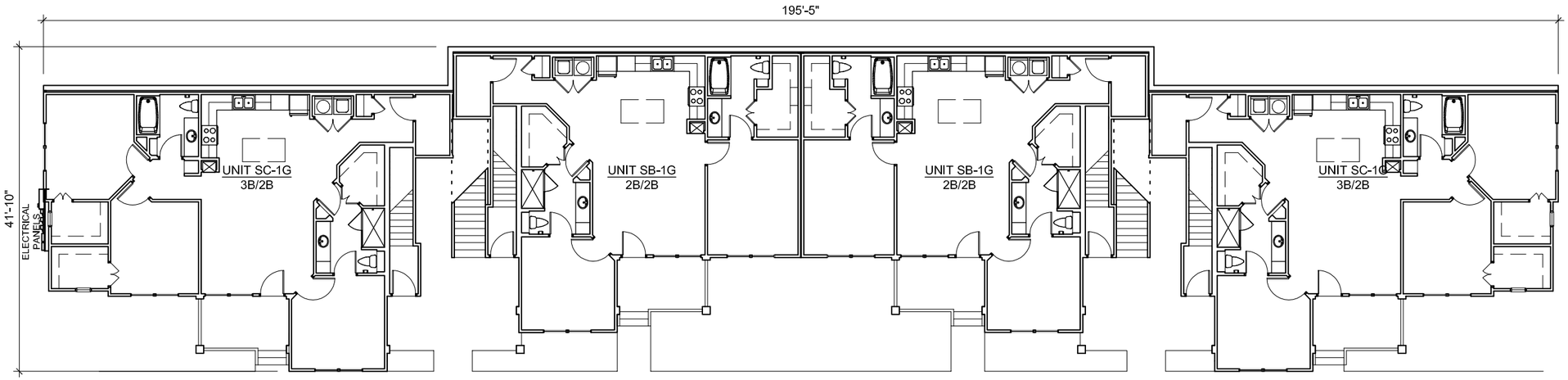
AREA

1ST FLOOR:	6,349 SF
2ND FLOOR:	12,371 SF
3RD FLOOR:	8,872 SF
TOTAL:	27,592 SF

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF AGRICULTURE
No. 105419
STATE OF TENNESSEE
2016.05.09



BUILDING TYPE S2 - LOWER FLOOR
(BUILDINGS #2 & #4)

SOUTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

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2016-05-09

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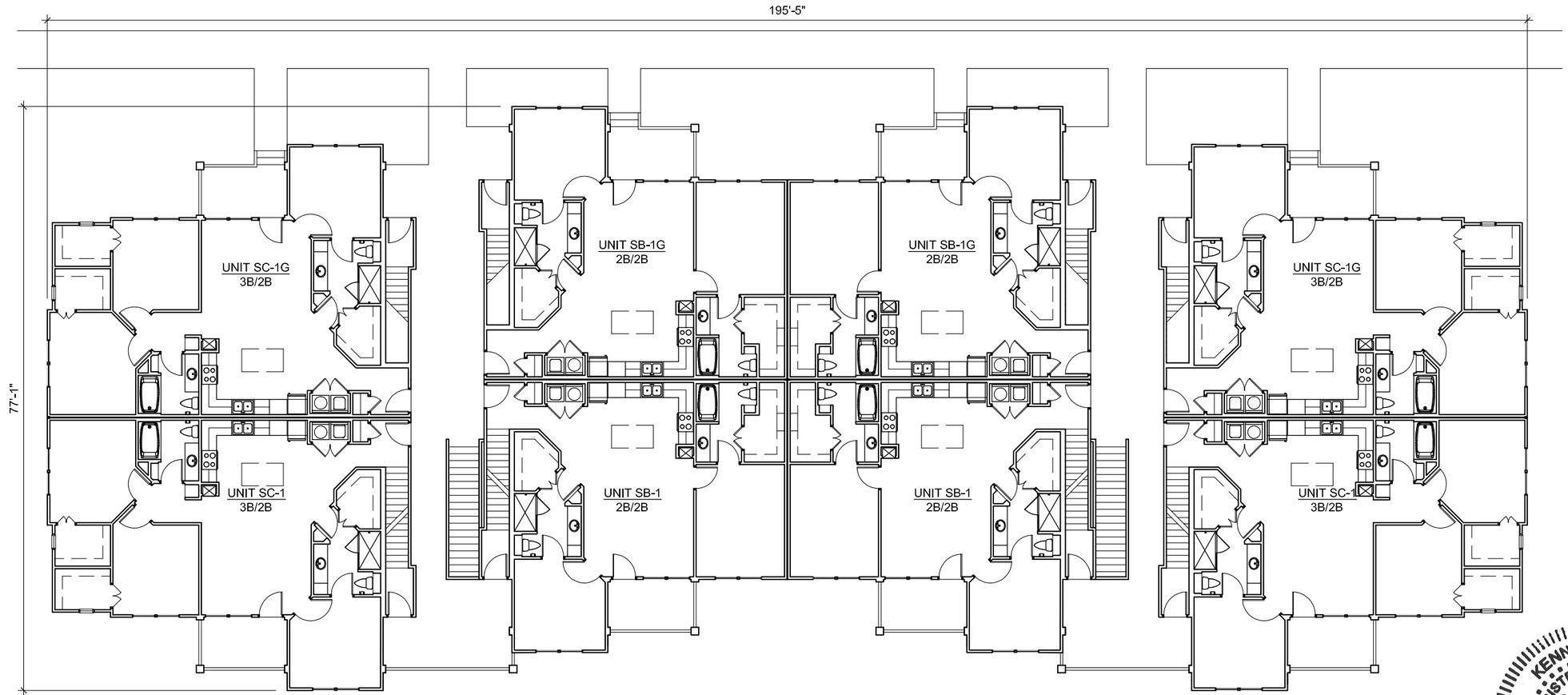
AREA

1ST FLOOR:	6,349 SF
2ND FLOOR:	12,371 SF
3RD FLOOR:	8,872 SF
TOTAL:	27,592 SF



GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

BUILDING TYPE S2 - GROUND FLOOR
(BUILDINGS #2 & #4)

SOUTH PARCEL

KENNETH LINEHAN
REGISTERED ARCHITECT
AGRICULTURE
COMMERCE
No. 105419
STATE OF TENNESSEE
2016.05.09

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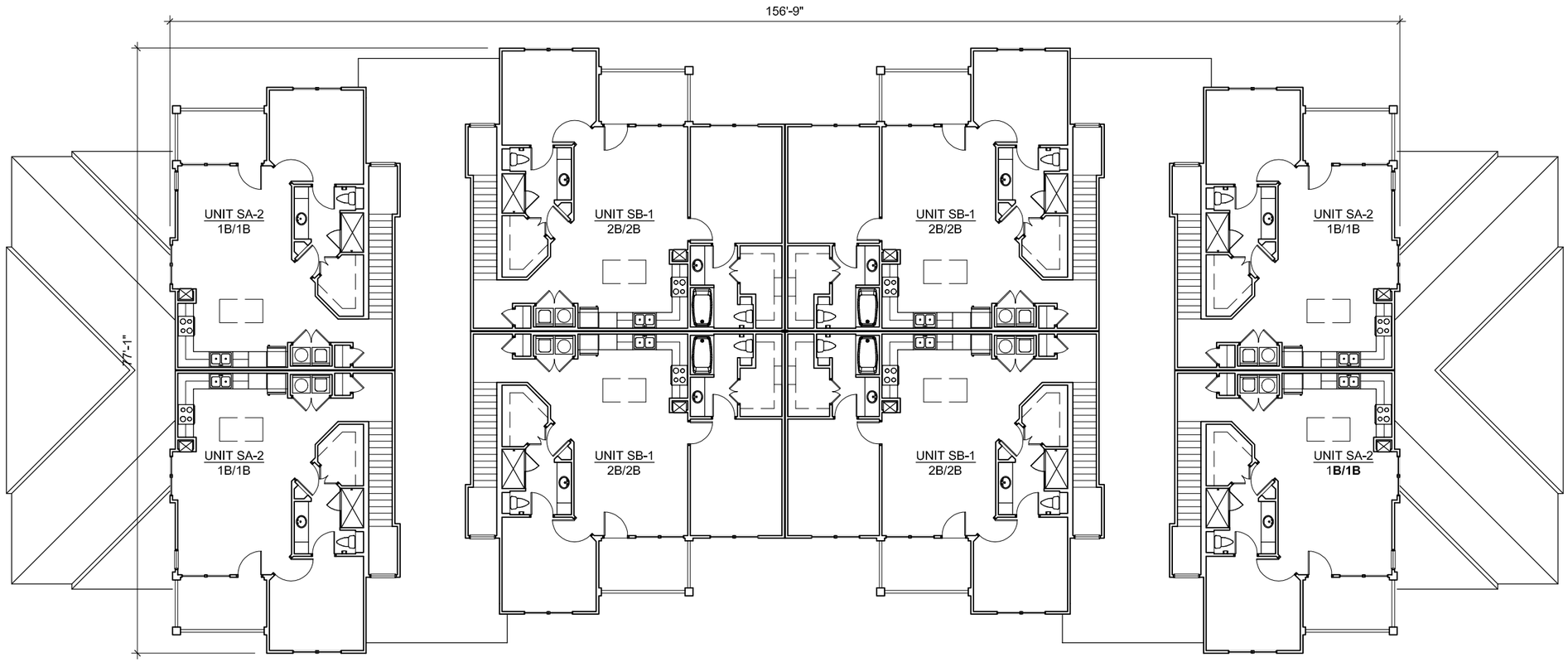
AREA

1ST FLOOR:	6,349 SF
2ND FLOOR:	12,371 SF
3RD FLOOR:	8,872 SF
TOTAL:	27,592 SF

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF AGRICULTURE
No. 105419
STATE OF TENNESSEE
2016.05.09



BUILDING TYPE S2 - SECOND FLOOR
(BUILDINGS #2 & #4)

SOUTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

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BUILDING PLANS
2016-05-09

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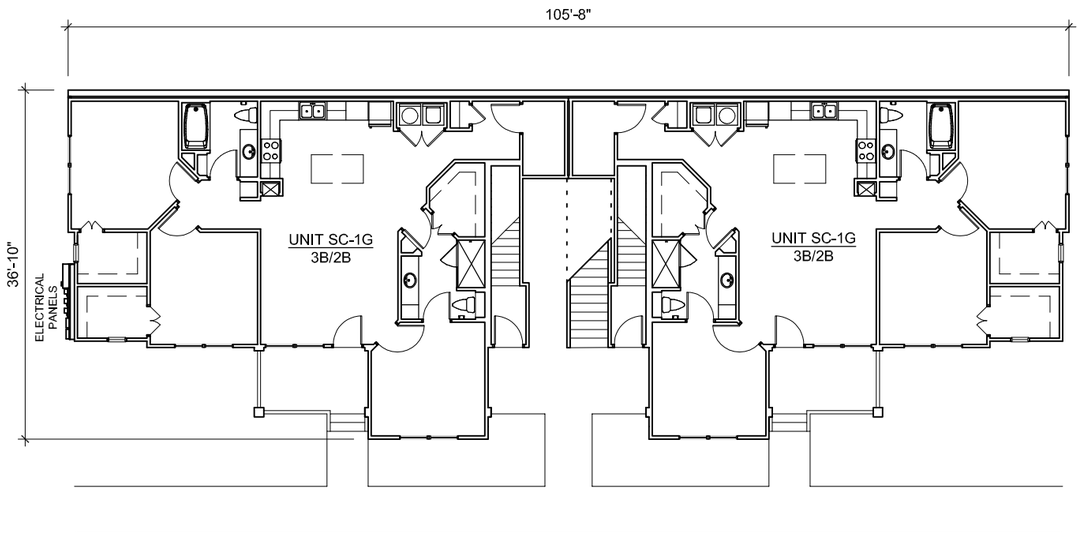
AREA

1ST FLOOR:	3,264 SF
2ND FLOOR:	6,528 SF
3RD FLOOR:	4,386 SF
TOTAL:	14,178 SF

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF AGRICULTURE
No. 105419
STATE OF TENNESSEE
2016.05.09



BUILDING TYPE S3 - LOWER FLOOR
(BUILDING #5)

SOUTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

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BUILDING PLANS
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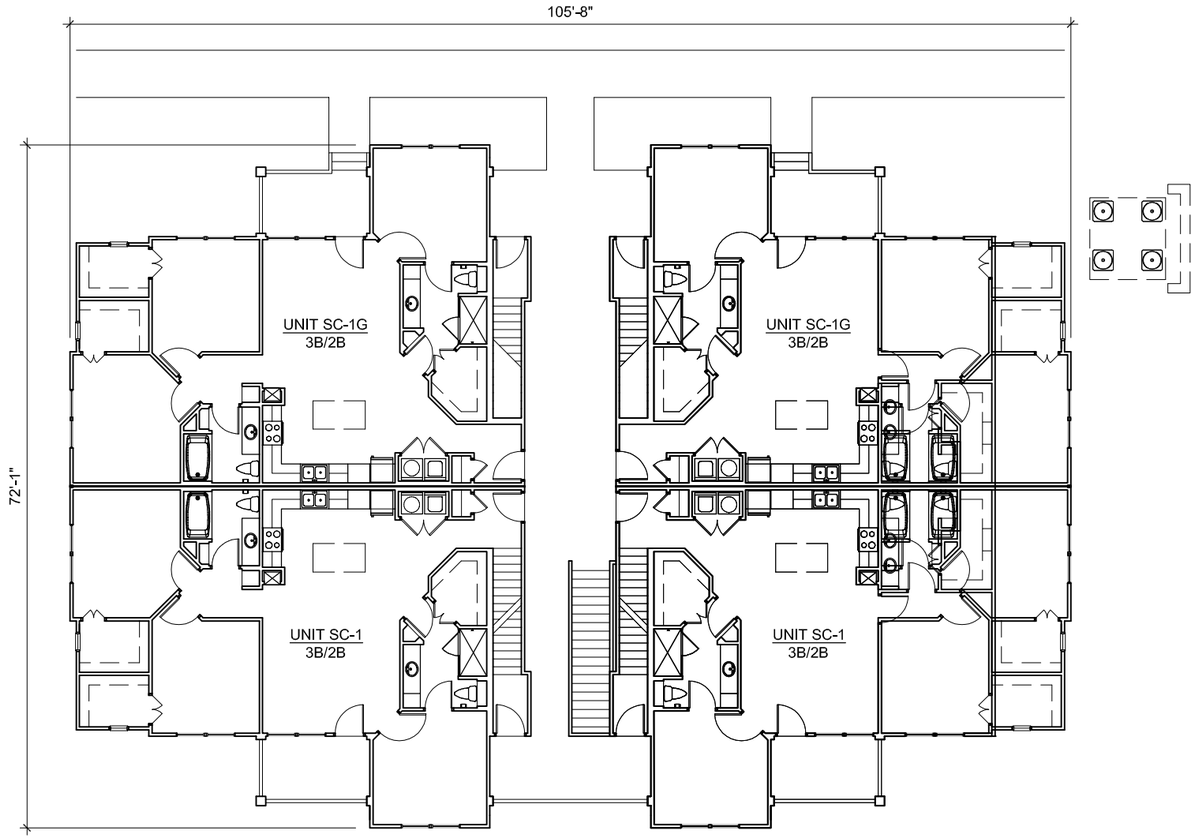
AREA

1ST FLOOR:	3,264 SF
2ND FLOOR:	6,528 SF
3RD FLOOR:	4,386 SF
TOTAL:	14,178 SF

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF COMMERCE AND INSURANCE
No. 105419
STATE OF TENNESSEE
2016.05.09



BUILDING TYPE S3 - GROUND FLOOR
(BUILDING #5)

SOUTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

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BUILDING PLANS
2016-05-09

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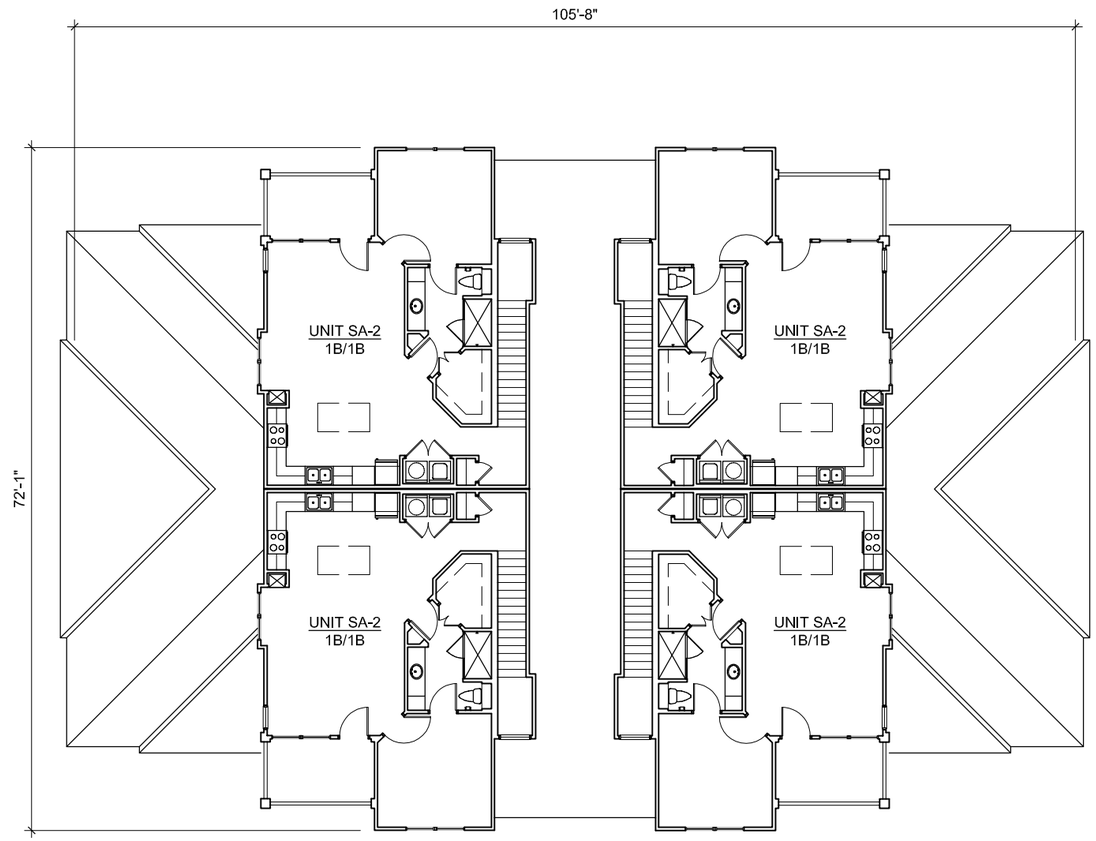
AREA

1ST FLOOR:	3,264 SF
2ND FLOOR:	6,528 SF
3RD FLOOR:	4,386 SF
TOTAL:	14,178 SF

KENNETH LINEHAN
REGISTERED ARCHITECT
AGRICULTURE
COMMERCE
No. 105419
STATE OF TENNESSEE
2016.05.09



BUILDING TYPE S3 - SECOND FLOOR
(BUILDING #5)

SOUTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

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BUILDING PLANS
2016-05-09

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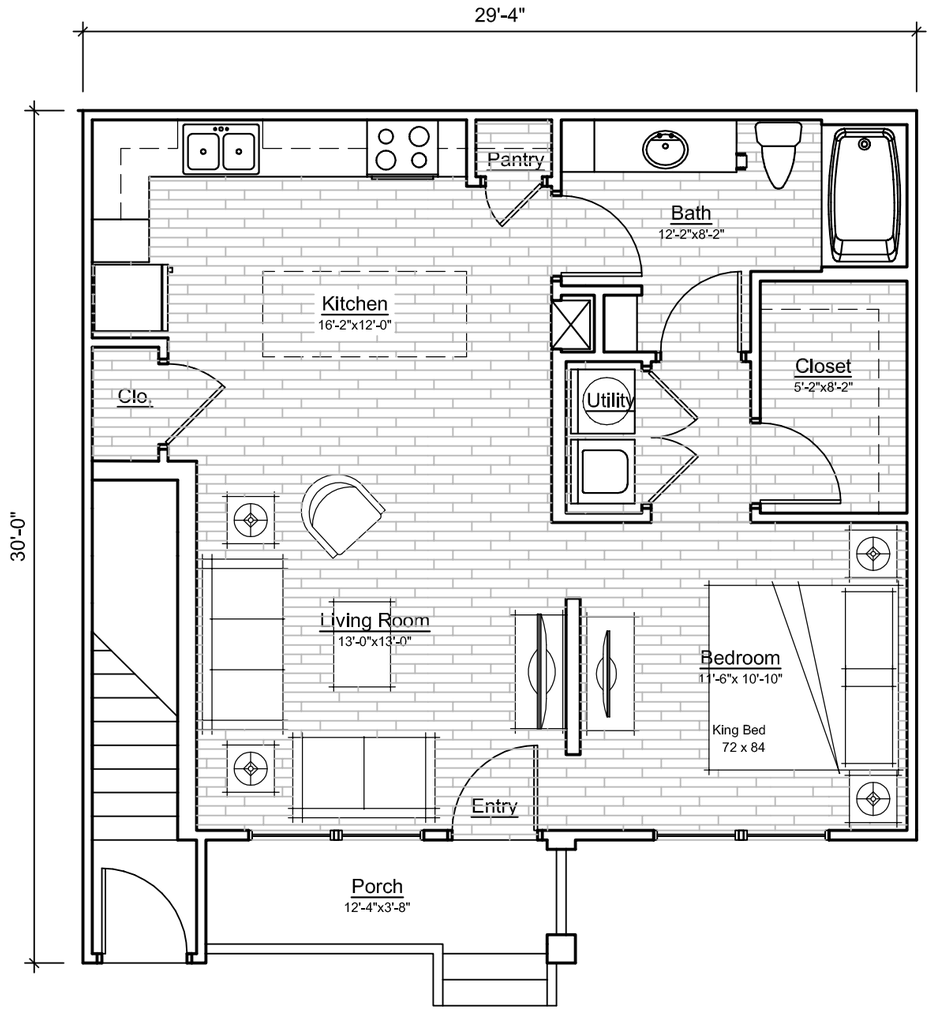
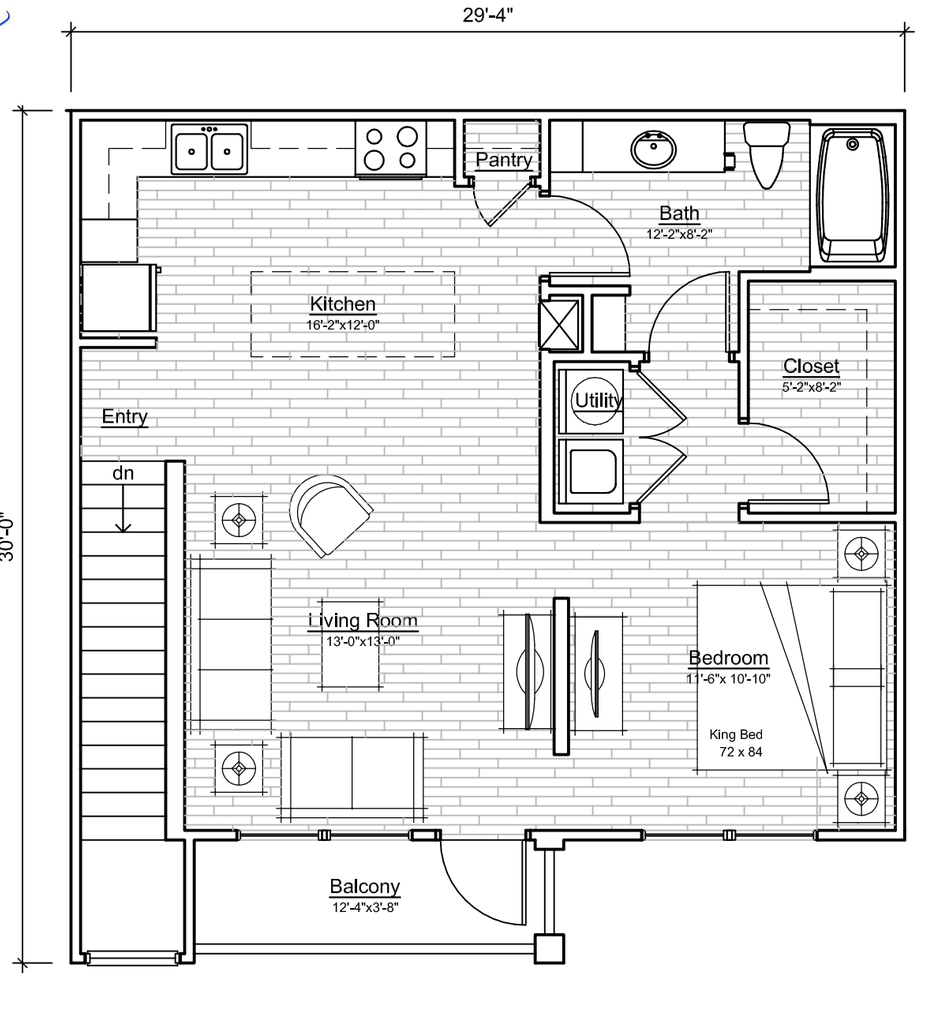


UNIT SA-1G - 1 BED / 1 BATH W/ PORCH

SCALE: 3/16" = 1'-0"

LIVING	=	702 S.F.
PORCH	=	56 S.F.
TOTAL	=	758 S.F.



UNIT SA-1 - 1 BED / 1 BATH W/ BALCONY

SCALE: 3/16" = 1'-0"

LIVING	=	772 S.F.
BALCONY	=	88 S.F.
TOTAL	=	860 S.F.

KENNETH LINEHAN REGISTERED ARCHITECT DEPARTMENT OF AGRICULTURE AND COMMERCE NO. 105419 STATE OF TENNESSEE

2016.05.09

PROJECT #6068

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EPOCH RESIDENTIAL™ SOUTH PARCEL UNIT PLANS

2016-05-09

THE EPOCH DEVELOPMENT

FRANKLIN, TENNESSEE

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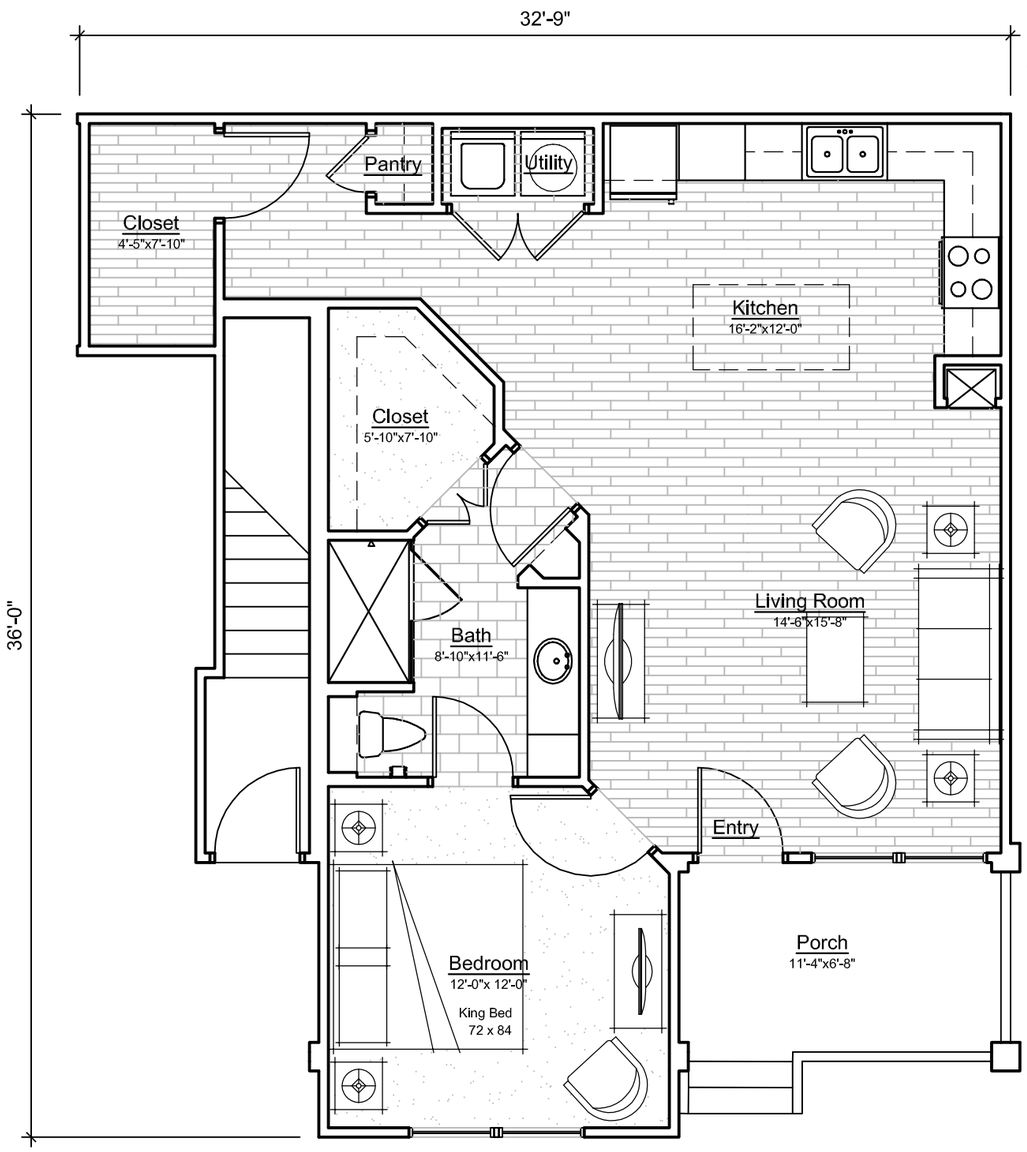

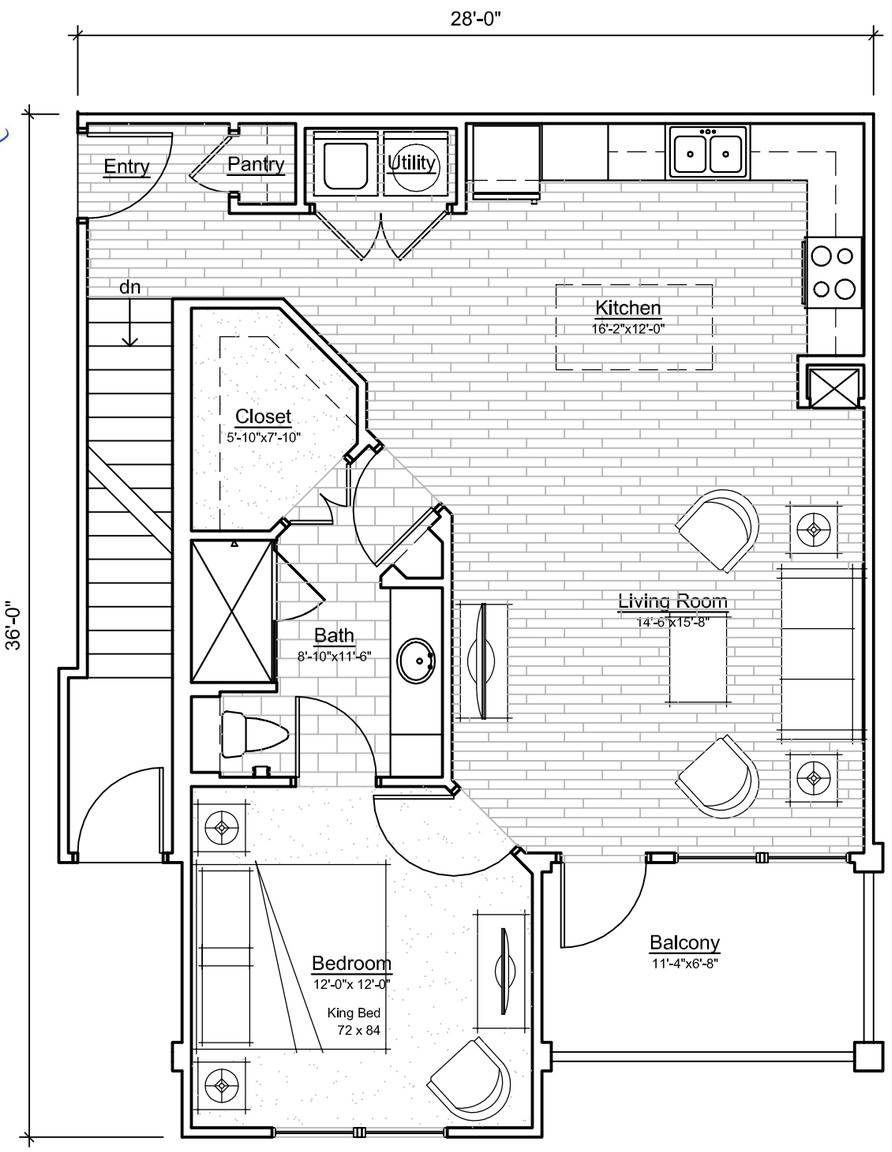

KENNETH LINEHAN REGISTERED ARCHITECT STATE OF TENNESSEE DEPARTMENT OF AGRICULTURE AND COMMERCE NO. 105419

2016.05.09

UNIT SA-2G - 1 BED / 1 BATH W/ PORCH

SCALE: 3/16" = 1'-0"

LIVING	=	829 S.F.
PORCH	=	88 S.F.
TOTAL	=	917 S.F.

UNIT SA-2 - 1 BED / 1 BATH W/ BALCONY

LIVING	=	866 S.F.
BALCONY	=	88 S.F.
TOTAL	=	954 S.F.

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2016-05-09

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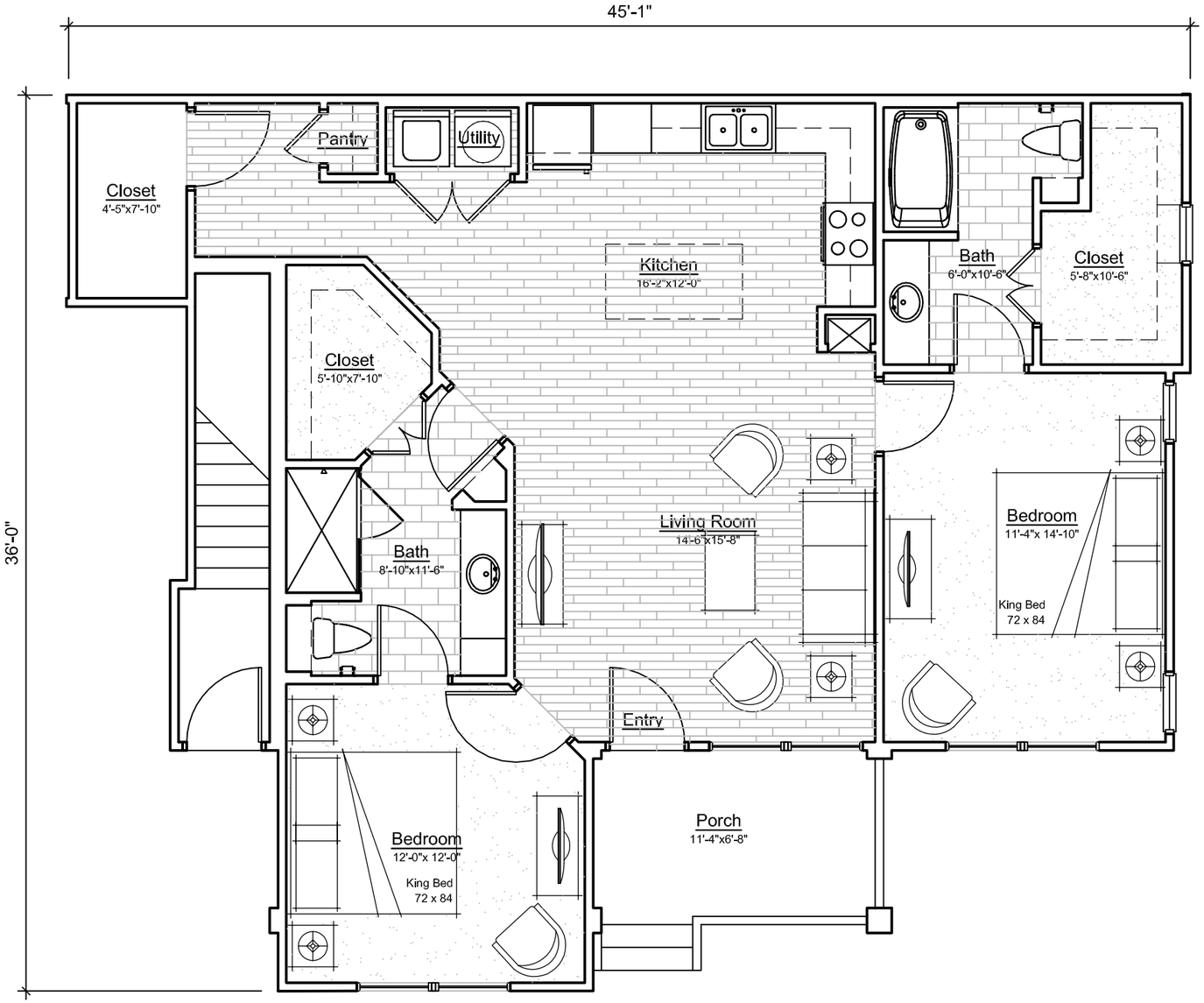

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF AGRICULTURE
COMMERCE
No. 10541
STATE OF TENNESSEE
2016.05.09

UNIT SB-1G - 2 BED / 2 BATH W/ PORCH

SCALE: 3/16" = 1'-0"

LIVING	=	1,144 S.F.
PORCH	=	88 S.F.
TOTAL	=	1,232 S.F.

PROJECT #6068

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2016-05-09 | FRANKLIN, TENNESSEE

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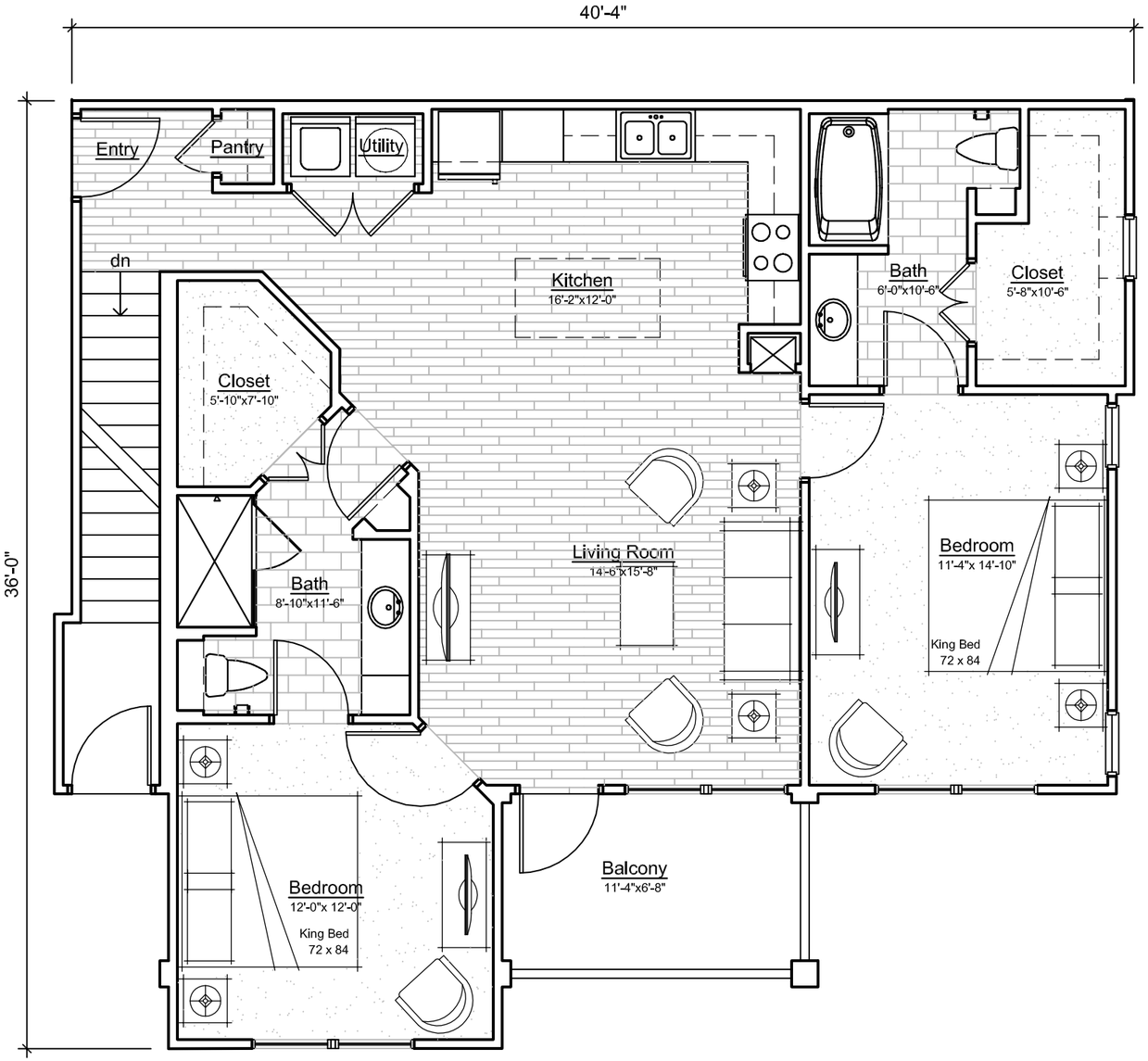

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF AGRICULTURE
No. 10541
STATE OF TENNESSEE
2016.05.09

UNIT SB-1 - 2 BED / 2 BATH W/ BALCONY

SCALE: 3/16" = 1'-0"

LIVING	=	1,181 S.F.
BALCONY	=	88 S.F.
TOTAL	=	1,269 S.F.

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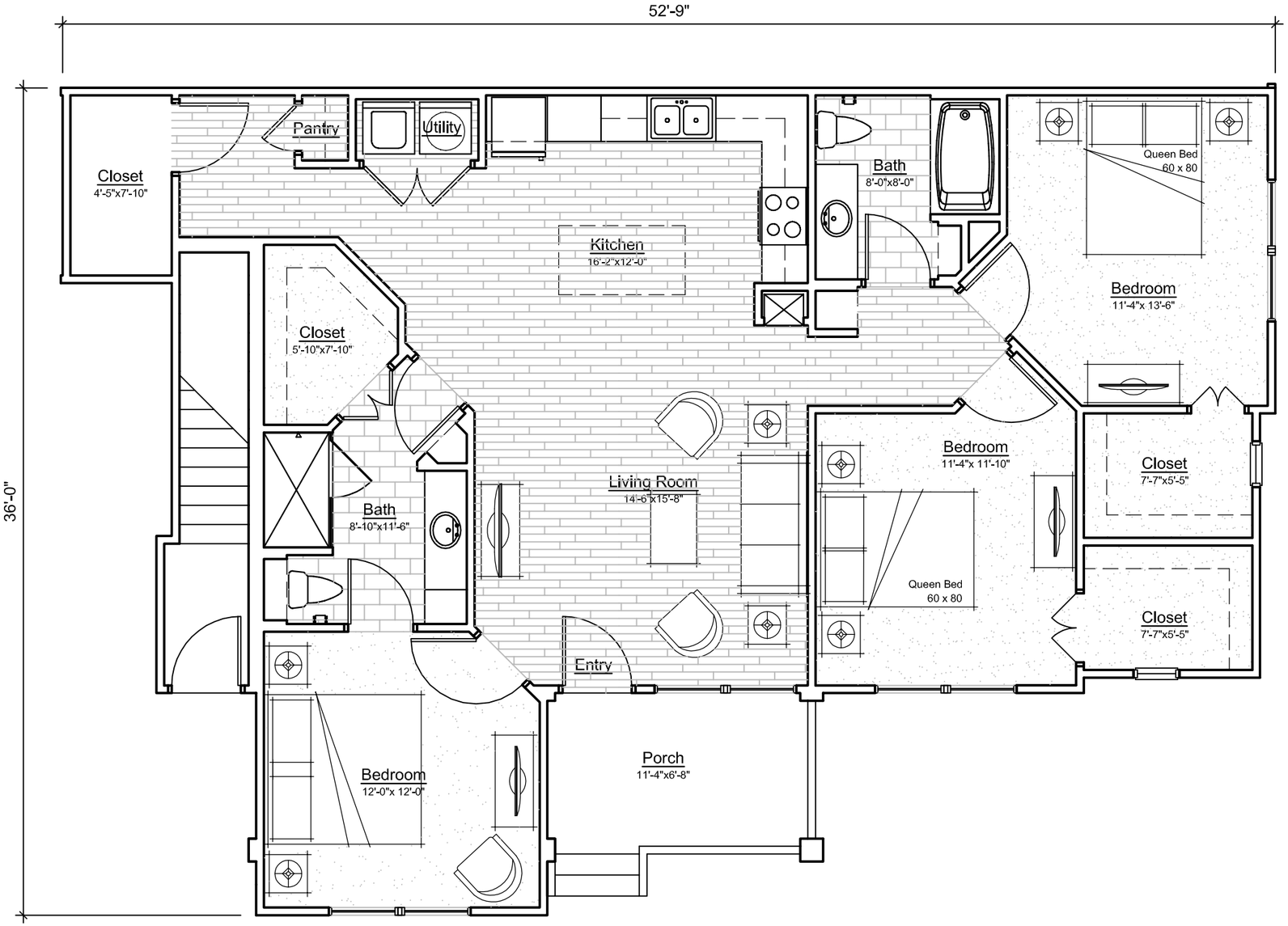

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AGRICULTURE
COMMERCE
No. 105419
STATE OF TENNESSEE
2016.05.09

UNIT SC-1G - 3 BED / 2 BATH W/ PORCH

SCALE: 3/16" = 1'-0"

LIVING	=	1,343 S.F.
PORCH	=	88 S.F.
TOTAL	=	1,431 S.F.

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AGRICULTURE
COMMERCE
No. 105419
STATE OF TENNESSEE
2016.05.09

UNIT SC-1 - 3 BED / 2 BATH W/ BALCONY

SCALE: 3/16" = 1'-0"

LIVING	=	1,380 S.F.
BALCONY	=	88 S.F.
TOTAL	=	1,468 S.F.

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AGRICULTURE
COMMERCE
No. 105419
STATE OF TENNESSEE
2016.05.09

NORTH ELEVATION
(OAK MEADOW DRIVE)

SOUTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

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BUILDING ELEVATIONS

2016-05-09

THE EPOCH DEVELOPMENT

FRANKLIN, TENNESSEE

PROJECT #6068

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AGRICULTURE
COMMERCE
No. 105419
STATE OF TENNESSEE
2016.05.09

SOUTH ELEVATION

GRAPHIC SCALE
16 0 4 8 16
(IN INCHES)
1/16" = 1'-0"

SOUTH PARCEL

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PROJECT #6068

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BUILDING ELEVATIONS
2016-05-09

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FRANKLIN, TENNESSEE

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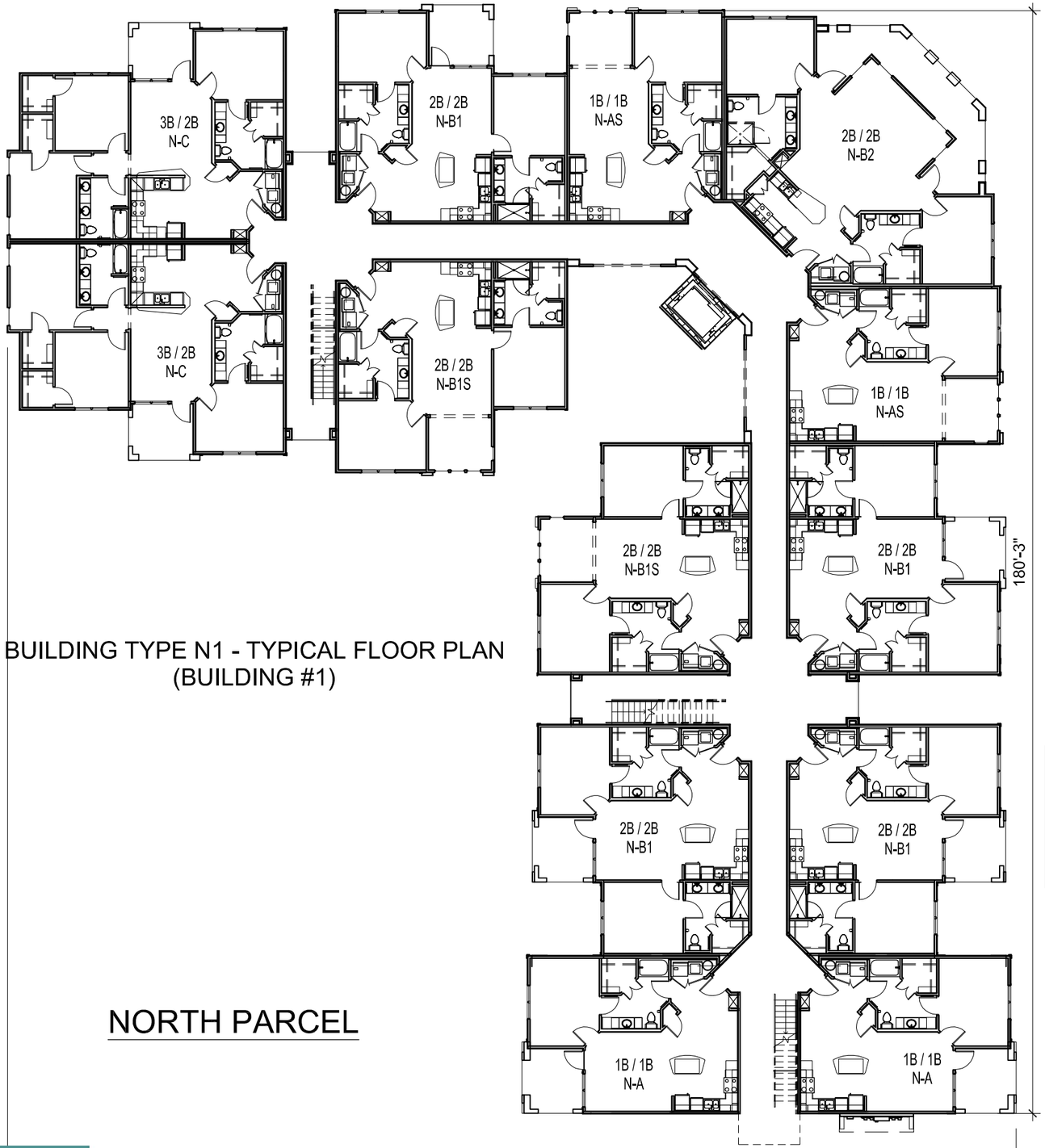
AREA

1ST FLOOR:	17,471 SF
2ND FLOOR:	17,471 SF
3RD FLOOR:	17,471 SF
4TH FLOOR:	17,471 SF
TOTAL:	69,884 SF



BUILDING TYPE N1 - TYPICAL FLOOR PLAN
(BUILDING #1)

NORTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1'-0"=20'-0"

BUILDING TYPES		Type	N1	N2	N3	N4		
No. of Bldgs		#	1	2	1	2	No. Units	Site Mix %
UNITS	1b/1b	N-A	16	32	24	0	72	35.3%
	2b/2b	N-B1	24	32	24	0	80	39.2%
	2b/2b	N-B2	4	8	4	0	16	7.8%
	2b/2b Carriage	N-B3	0	0	0	4	4	2.0%
	3b/2b	N-C	8	16	8	0	32	15.7%
TOTAL			52	88	60	4	204	100%
GARAGES			0	0	0	12	12	

KENNETH LINEHAN
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AGRICULTURE
COMMERCE
No. 10541
STATE OF TENNESSEE
2016.05.09

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2016-05-09

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AREA

1ST FLOOR:	14,661 SF
2ND FLOOR:	14,661 SF
3RD FLOOR:	14,661 SF
4TH FLOOR:	14,661 SF
TOTAL:	58,644 SF

BUILDING TYPE N2 - TYPICAL FLOOR PLAN
(BUILDINGS #2 & #3)

BUILDING TYPES		Type	N1	N2	N3	N4	No. Units	Site Mix %
No. of Bldgs		#	1	2	1	2		
UNITS	1b/1b	N-A	16	32	24	0	72	35.3%
	2b/2b	N-B1	24	32	24	0	80	39.2%
	2b/2b	N-B2	4	8	4	0	16	7.8%
	2b2b Carriage	N-B3	0	0	0	4	4	2.0%
	3b/2b	N-C	8	16	8	0	32	15.7%
TOTAL			52	88	60	4	204	100%
GARAGES			0	0	0	12	12	

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1'-0"=20'-0"

NORTH PARCEL

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BUILDING PLANS
2016-05-09

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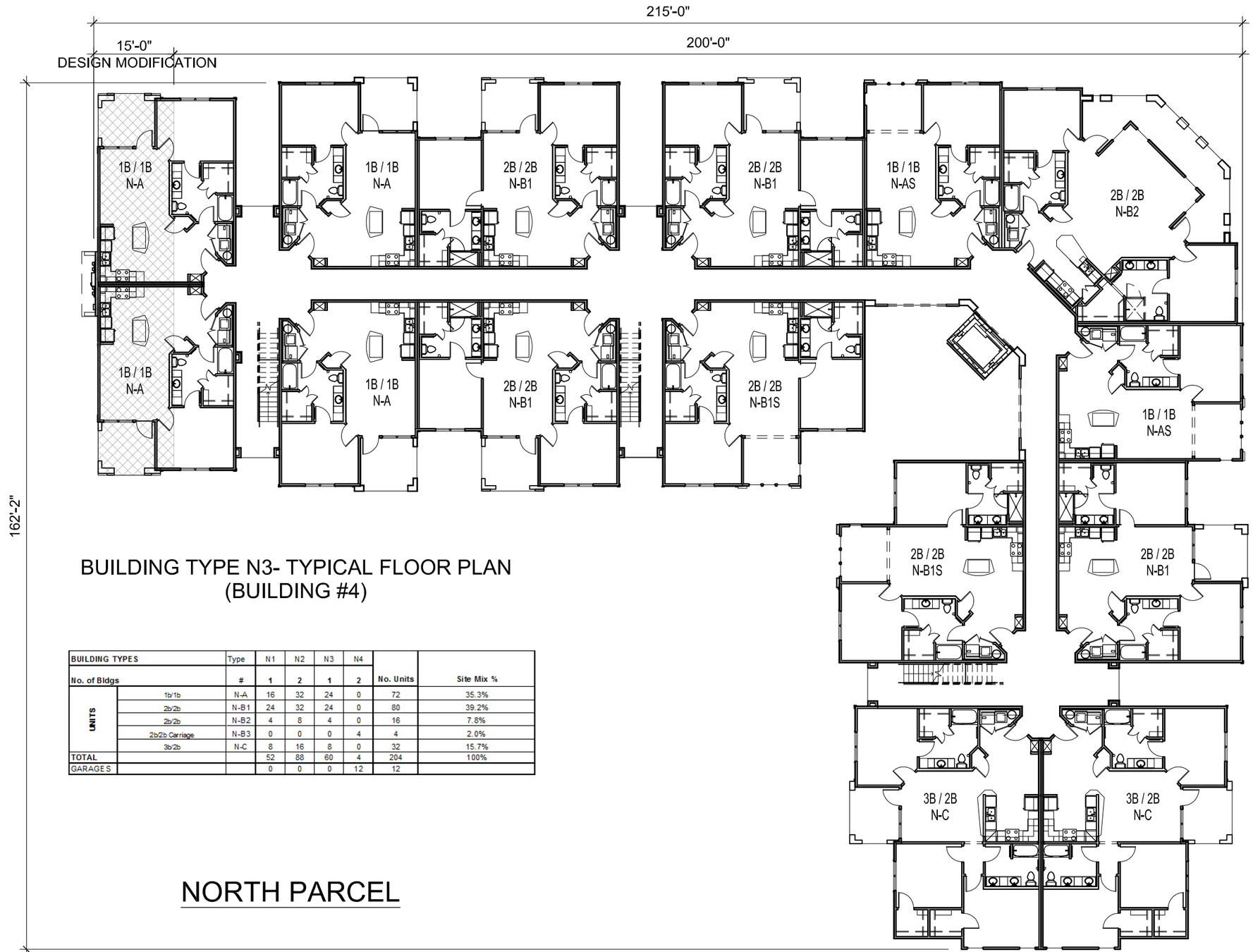
AREA

1ST FLOOR:	19,637 SF
2ND FLOOR:	19,637 SF
3RD FLOOR:	19,637 SF
4TH FLOOR:	19,637 SF
TOTAL:	78,548 SF



BUILDING TYPE N3- TYPICAL FLOOR PLAN (BUILDING #4)

BUILDING TYPES		Type	N1	N2	N3	N4	No. Units	Site Mix %
No. of Bldgs		#	1	2	1	2		
UNITS	1b/1b	N-A	16	32	24	0	72	35.3%
	2b/2b	N-B1	24	32	24	0	80	39.2%
	2b/2b	N-B2	4	8	4	0	16	7.8%
	2b/2b Carriage	N-B3	0	0	0	4	4	2.0%
	3b/2b	N-C	8	16	8	0	32	15.7%
TOTAL			52	88	60	4	204	100%
GARAGES			0	0	0	12	12	

KENNETH LINEHAN
REGISTERED ARCHITECT
NO. 105419
STATE OF TENNESSEE
COMMERCE
AGRICULTURE
2016.05.09

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1'-0"=20'-0"

NORTH PARCEL

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PROJECT #6068

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BUILDING PLANS

2016-05-09

THE EPOCH DEVELOPMENT

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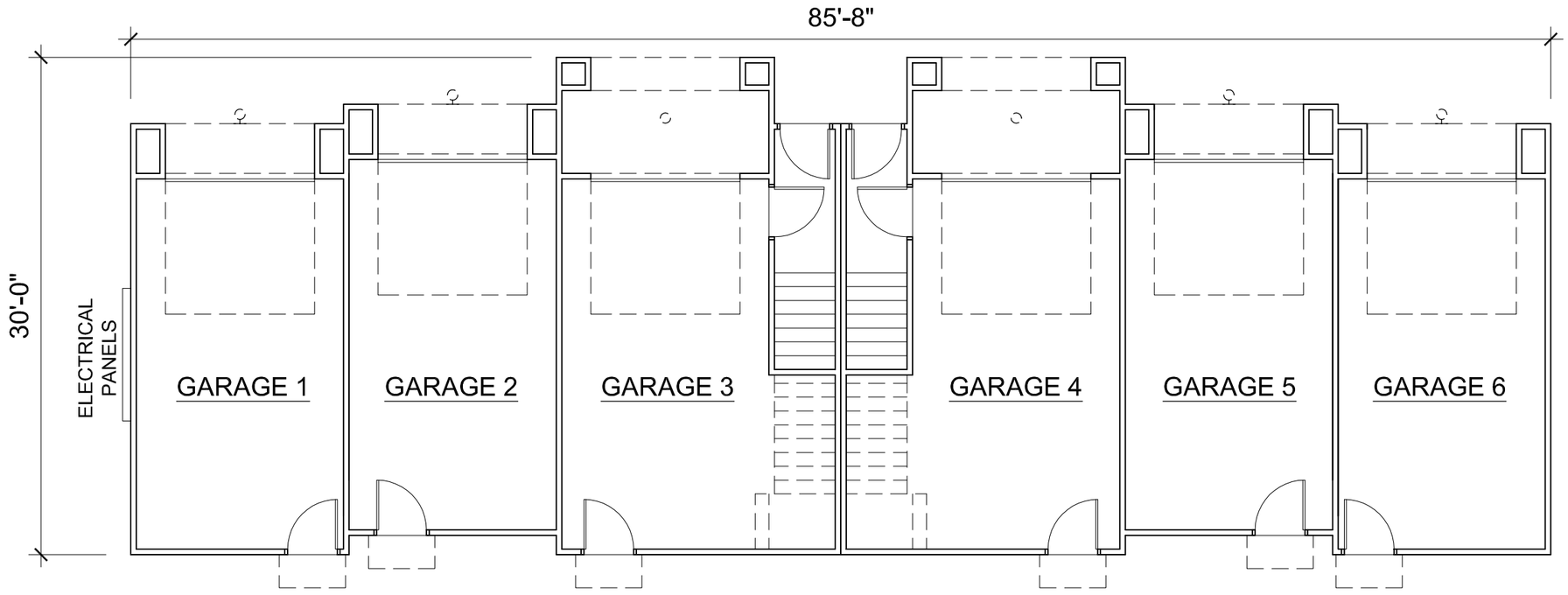
AREA

1ST FLOOR:	1,998 SF
2ND FLOOR:	2,233 SF
TOTAL:	4,231 SF

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF AGRICULTURE AND COMMERCE
No. 10541
STATE OF TENNESSEE
2016.05.09



BUILDING TYPE N4- GROUND FLOOR PLAN
(BUILDINGS #5 & #6)

BUILDING TYPES		Type	N1	N2	N3	N4		
No. of Bldgs		#	1	2	1	2	No. Units	Site Mix %
UNITS	1b/1b	N-A	16	32	24	0	72	35.3%
	2b/2b	N-B1	24	32	24	0	80	39.2%
	2b/2b	N-B2	4	8	4	0	16	7.8%
	2b/2b Carriage	N-B3	0	0	0	4	4	2.0%
	3b/2b	N-C	8	16	8	0	32	15.7%
TOTAL			52	88	60	4	204	100%
GARAGES			0	0	0	12	12	

NORTH PARCEL

GRAPHIC SCALE

4 0 1 2 4

(IN INCHES)
3/16" = 1'-0"

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2016-05-09

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AREA

1ST FLOOR:	1,998 SF
2ND FLOOR:	2,233 SF
TOTAL:	4,231 SF

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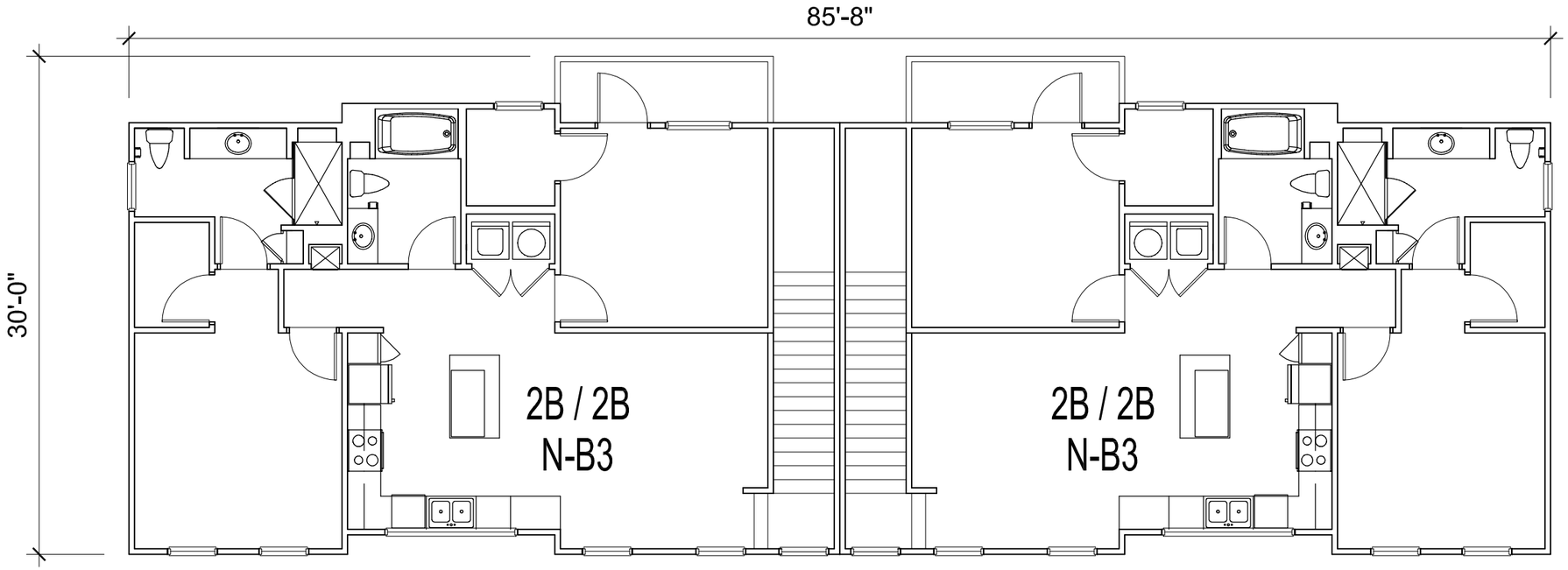

BUILDING TYPE N4- SECOND FLOOR PLAN
(BUILDINGS #5 & #6)

BUILDING TYPES		Type	N1	N2	N3	N4		
No. of Bldgs		#	1	2	1	2	No. Units	Site Mix %
UNITS	1b/1b	N-A	16	32	24	0	72	35.3%
	2b/2b	N-B1	24	32	24	0	80	39.2%
	2b/2b	N-B2	4	8	4	0	16	7.8%
	2b/2b Carriage	N-B3	0	0	0	4	4	2.0%
	3b/2b	N-C	8	16	8	0	32	15.7%
TOTAL			52	88	60	4	204	100%
GARAGES			0	0	0	12	12	

NORTH PARCEL

GRAPHIC SCALE

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(IN INCHES)
3/16" = 1'-0"

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GRAPHIC SCALE

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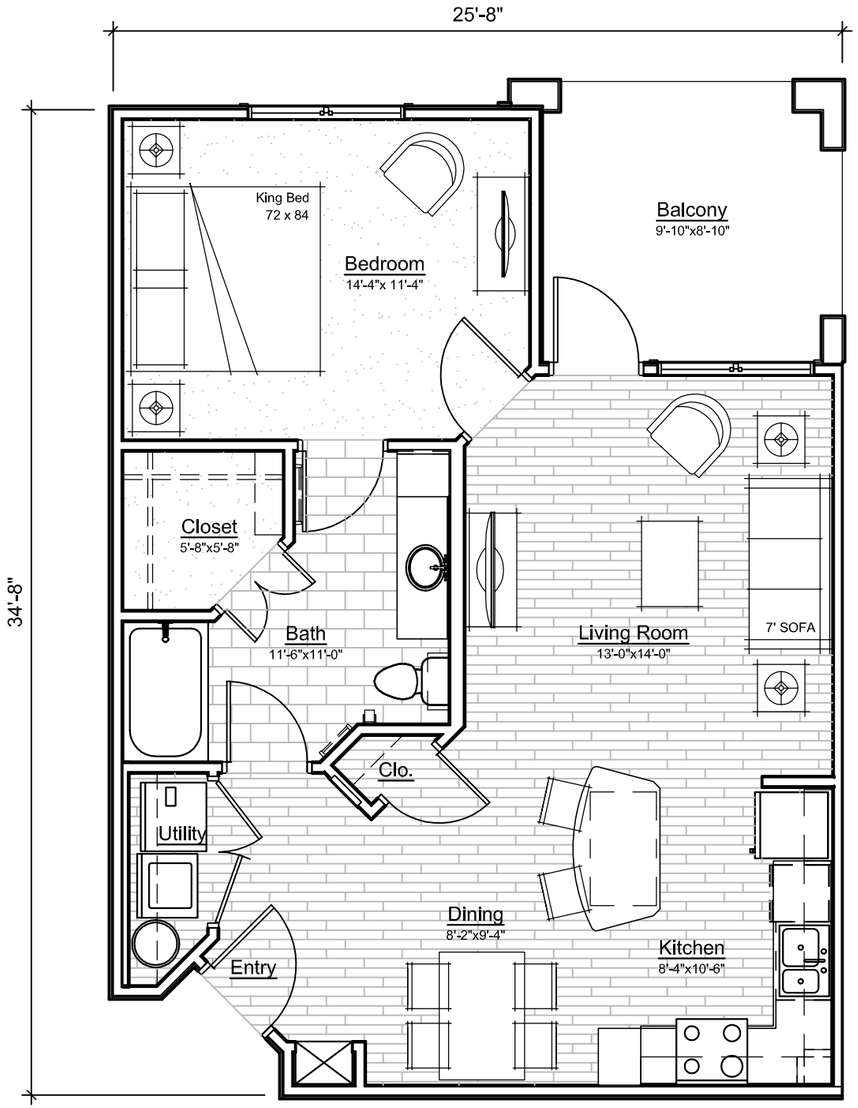
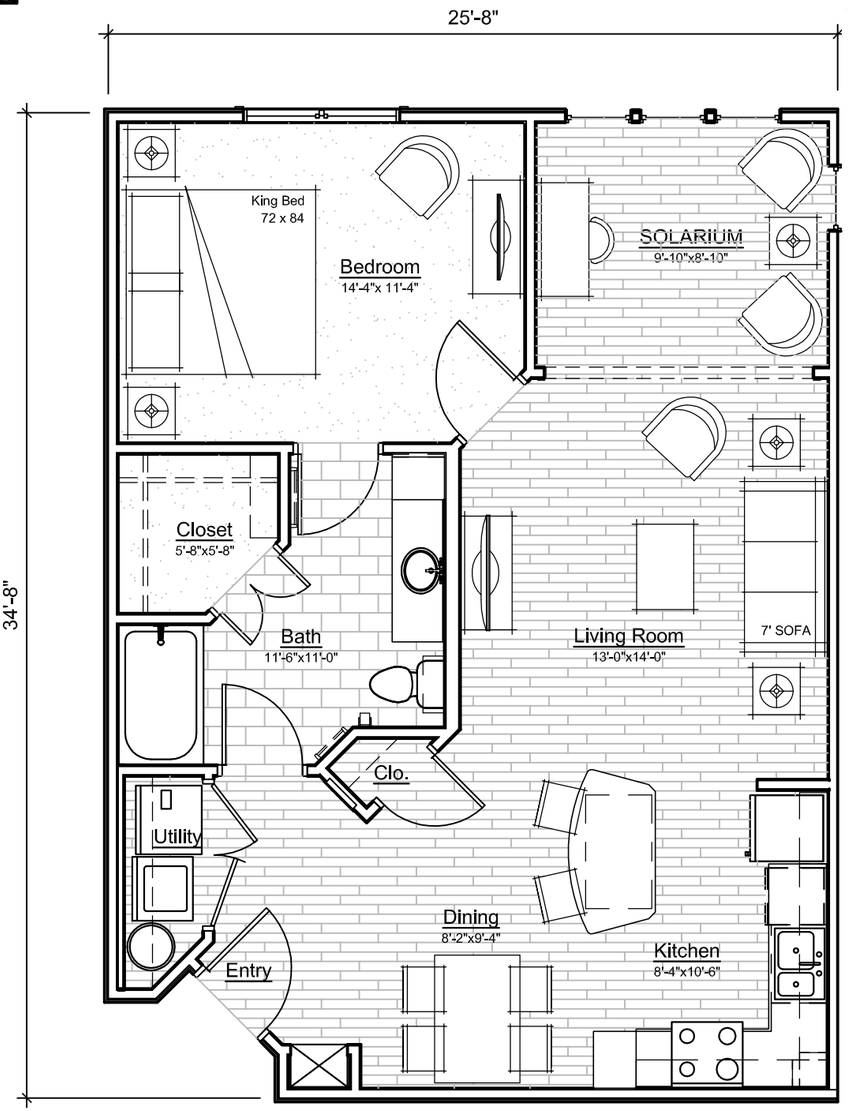
(IN INCHES)
3/16" = 1'-0"



UNIT N-A - 1 BED / 1 BATH W/ BALCONY

SCALE: 3/16" = 1'-0"

LIVING	=	789 S.F.
BALCONY	=	102 S.F.
TOTAL	=	891 S.F.



UNIT N-AS - 1 BED / 1 BATH W/ SOLARIUM LIVING = 891 S.F.

SCALE: 3/16" = 1'-0"

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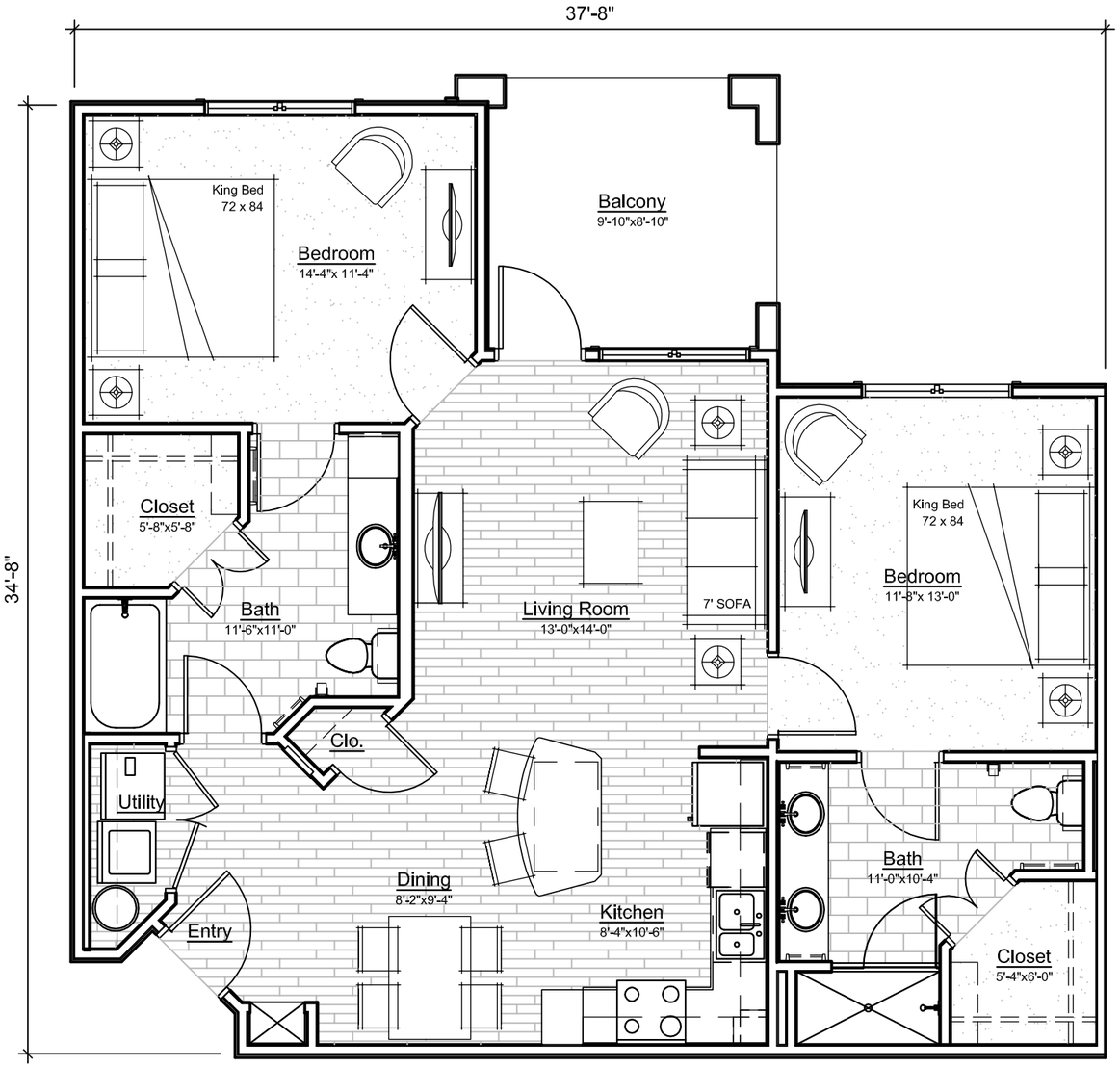
GRAPHIC SCALE

4 0 1 2 4

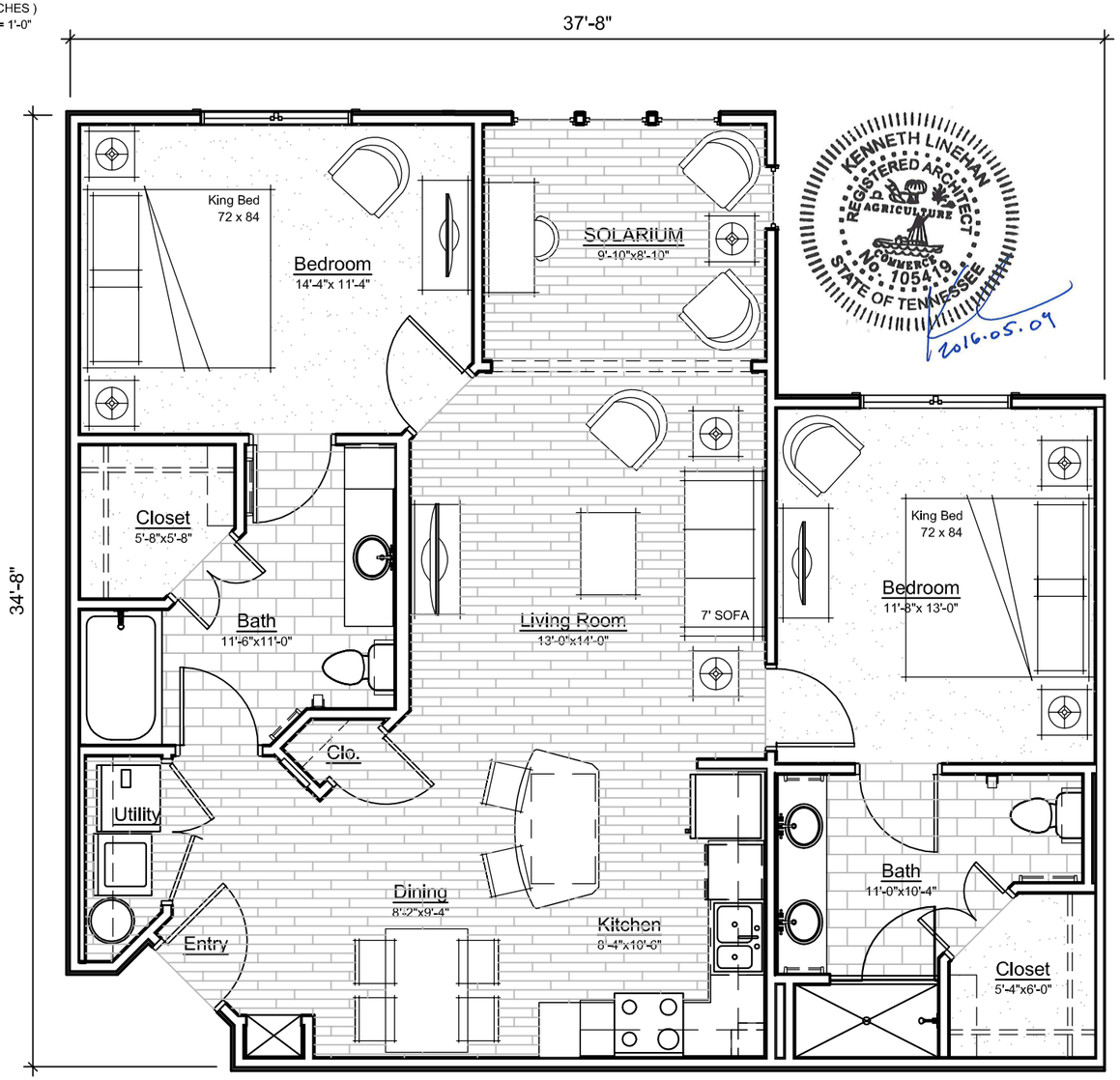
(IN INCHES)
3/16" = 1'-0"



UNIT N-B1 - 2 BED / 2 BATH W/ BALCONY

SCALE: 3/16" = 1'-0"

LIVING	=	1,072 S.F.
BALCONY	=	108 S.F.
TOTAL	=	1,180 S.F.



UNIT N-B1S - 2 BED / 2 BATH W/ SOLARIUM

SCALE: 3/16" = 1'-0"

LIVING = 1,180 S.F.

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GRAPHIC SCALE

4 0 1 2 4

(IN INCHES)
3/16" = 1'-0"

UNIT N-B2 - 2 BED / 2 BATH W/ BALCONY

SCALE: 3/16" = 1'-0"

LIVING	=	1,347 S.F.
BALCONY	=	309 S.F.
TOTAL	=	1,656 S.F.

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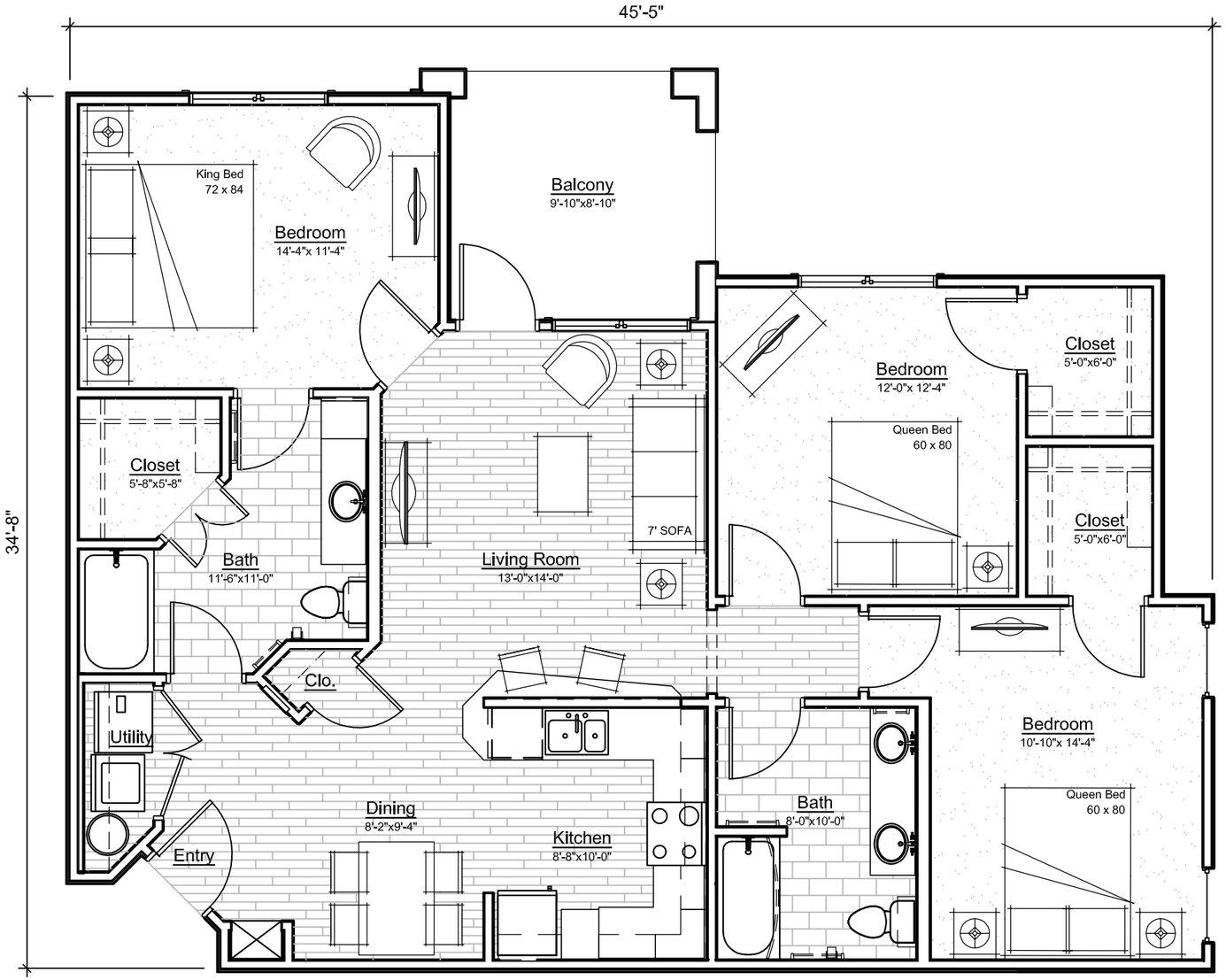

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GRAPHIC SCALE

4 0 1 2 4

(IN INCHES)
3/16" = 1'-0"

UNIT N-C - 3 BED / 2 BATH W/ BALCONY

SCALE: 3/16" = 1'-0"

LIVING	=	1,304 S.F.
BALCONY	=	108 S.F.
TOTAL	=	1,412 S.F.

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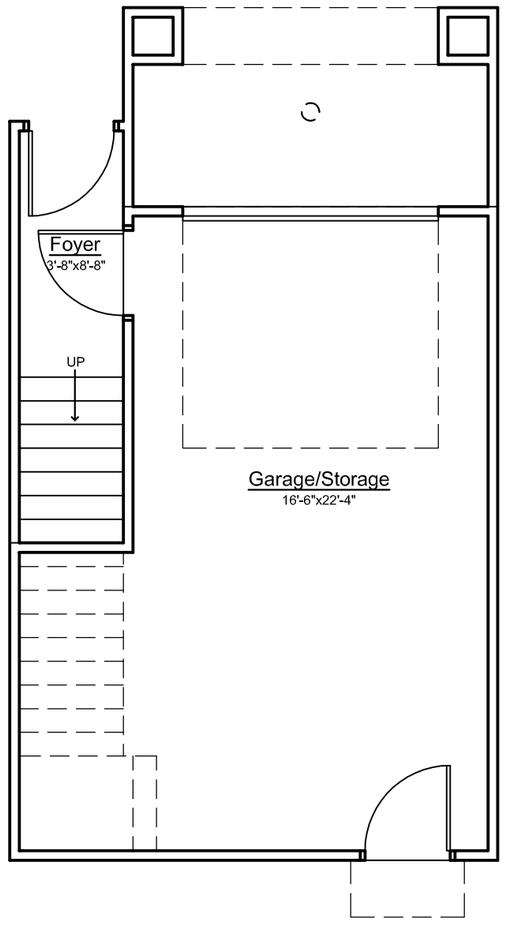

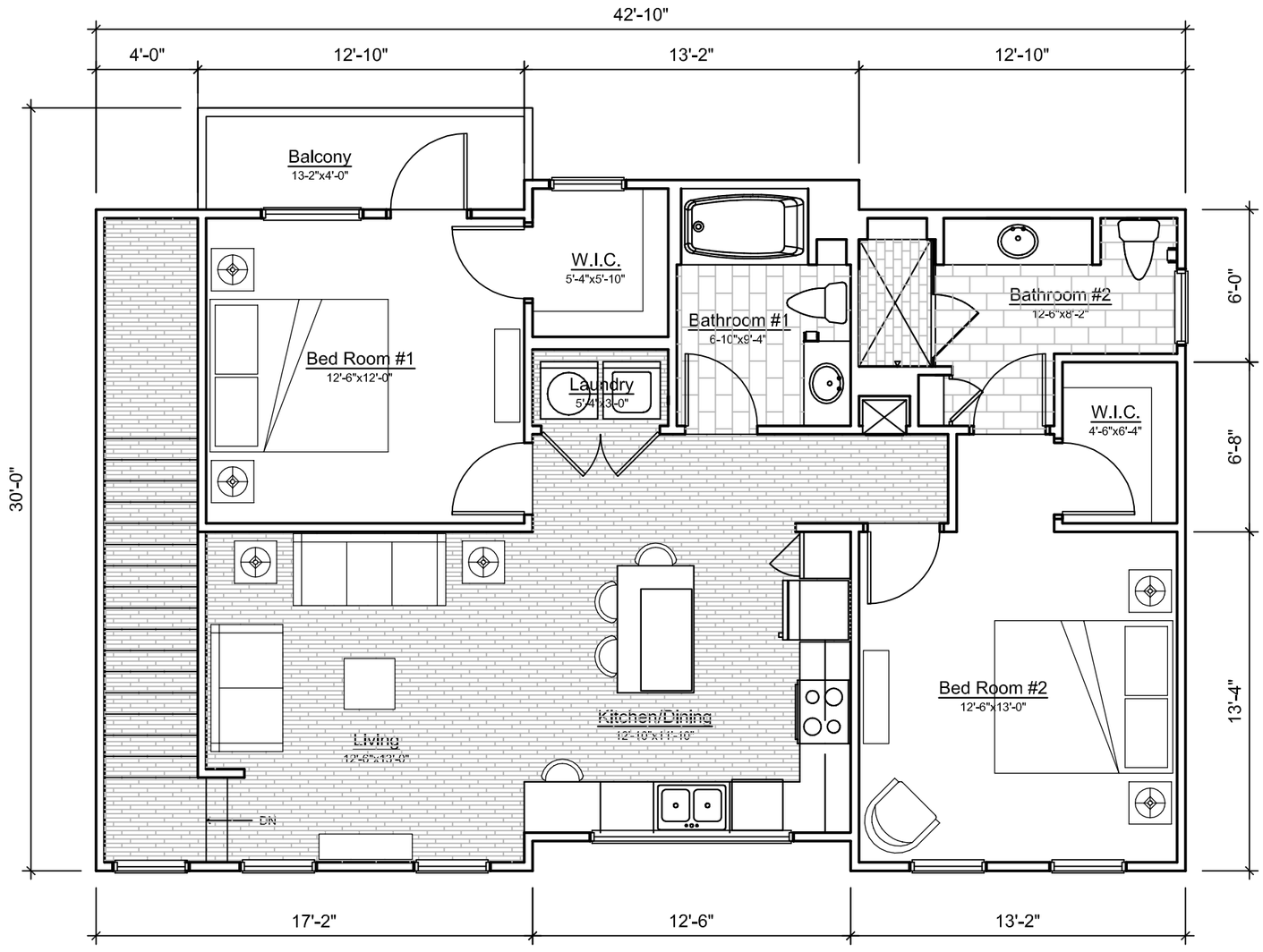

GRAPHIC SCALE

4 0 1 2 4

(IN INCHES)
3/16" = 1'-0"

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UNIT N-B3 - 2 BED / 2 BATH CARRIAGE HOME

SCALE: 3/16" = 1'-0"

LIVING	=	1,114 S.F.
BALCONY	=	52 S.F.
GARAGE	=	348 S.F.
TOTAL	=	1,514 S.F.

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GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

ELEVATION

NORTH PARCEL

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BUILDING ELEVATIONS

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SIDE ELEVATION

NORTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

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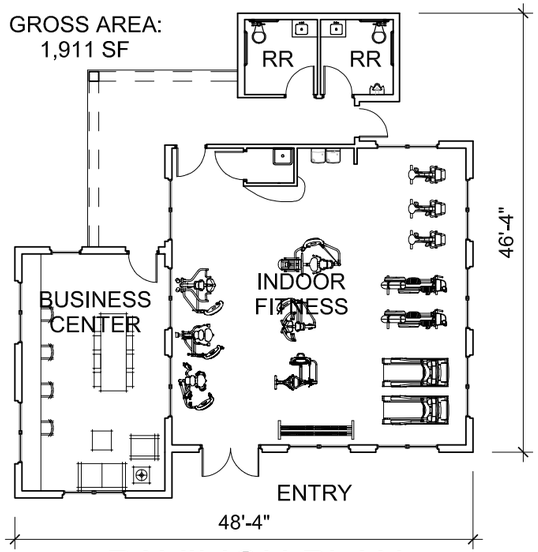
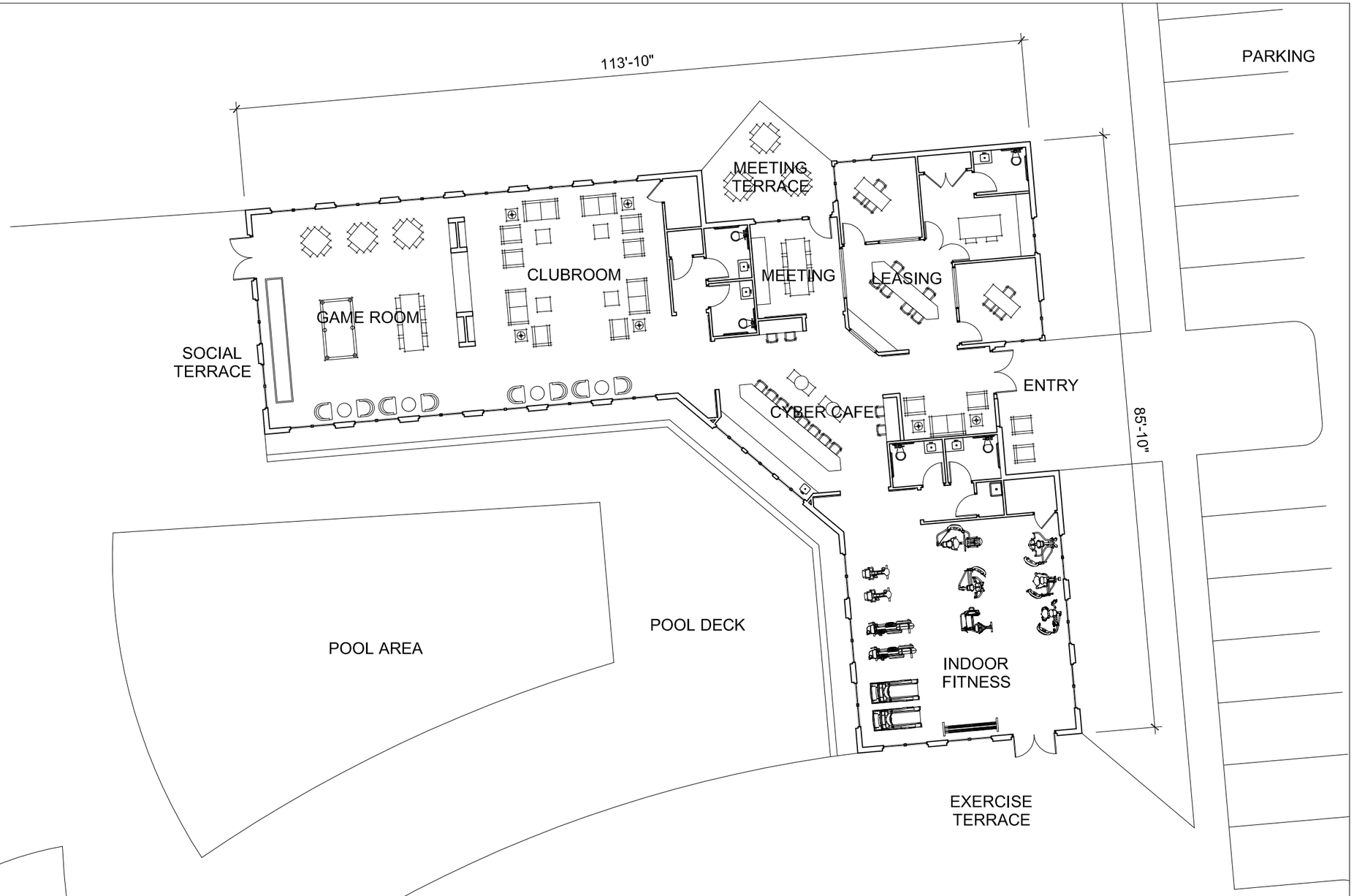


PAVILION PLAN
NORTH PARCEL



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GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

GROSS AREA - 5,370 SF

SOUTH PARCEL

PAGE 31

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CLUBHOUSE PLAN
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GRAPHIC SCALE

8 0 2 4 8

(IN INCHES)
1/8" = 1'-0"

AMENITY / CLUBHOUSE CENTER
ELEVATION

SOUTH PARCEL

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POOL PAVILION ELEVATION

NORTH PARCEL

GRAPHIC SCALE
8 0 2 4 8
(IN INCHES)
1/8" = 1'-0"

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F i s c h b a c h
Transportation Group, LLC
Traffic Engineering and Planning

Traffic Impact Study

Epoch Apartments
Oak Meadow Drive
Franklin, TN

Prepared May 2016
(Originally Prepared April 2016)
For Epoch Residential

FTG, LLC
P.O. Box 682736
Franklin, TN 37068
(615) 771-8022 phone
Gillian@FTGtraffic.com

Traffic Impact Study

Epoch Apartments
Oak Meadow Drive

Franklin, Tennessee

Prepared May 2016
(Originally Prepared April 2016)

PREPARED FOR:
Epoch Residential
359 Carolina Avenue
Winter Park, FL 32789

PREPARED BY:
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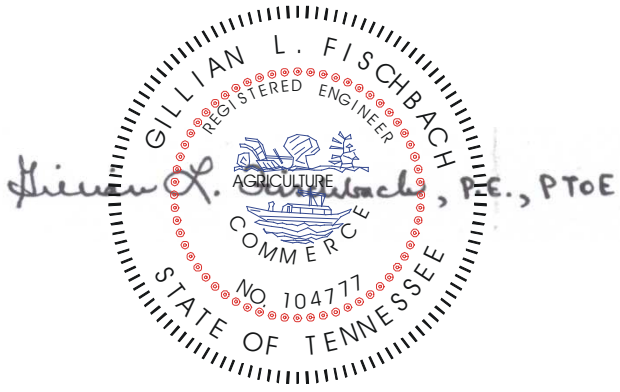

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1. INTRODUCTION

This traffic study has been prepared in order to identify the traffic impacts of a multi-family residential development that is proposed to be constructed on the north and south sides of Oak Meadow Drive, east of S. Royal Oaks Boulevard, in Franklin, Tennessee.

For the purposes of this study, existing and background traffic volumes were established, and capacity analyses were conducted for these conditions. Also, trip generation calculations were performed, and the trips which are expected to be generated by the proposed project were distributed to the roadway system and added to the background traffic volumes. The roadways and intersections which provide access to the site were then re-evaluated to determine the traffic impacts of the proposed project. Access needs for the project were evaluated, and the necessary roadway and/or traffic control improvements were identified. This report presents the results of these analyses and the subsequent recommendations.

It is important to note that the scope of this Traffic Impact Study was provided by the City of Franklin Engineering Department and their third-party private consultant, Neel-Schaffer, Inc. The approved scope is included in in Appendix A.

2. PROJECT DESCRIPTION

The location of the proposed project is shown in Figure 1. As shown, the project site is located on the north and south sides of Oak Meadow Drive, east of S. Royal Oaks Boulevard, in Franklin, Tennessee. The current project site plan is shown in Figures 2A and 2B. As shown, the proposed plan includes 98 apartments on the south side of Oak Meadow Drive and 204 apartments on the north side of Oak Meadow Drive.

Access for the southern portion of the site will be provided at two locations on Oak Meadow Drive, and access for the northern portion of the site will be provided at one location on the eastern access for the Home Depot shopping center on the north side of Oak Meadow Drive. Also, secondary access for the northern portion of the site will be provided at the existing terminus of Riverside Drive.

Also, it is possible that, in the future, a commercial site will be developed in the southeast quadrant of the intersection of S. Royal Oaks Boulevard and Oak Meadow Drive. For the purposes of this study, it was assumed that 15,000 sq.ft. of specialty retail space will be constructed on this site as shown in Figure 2C. Also, for the purposes of this study, it was assumed that sole access for the future commercial site will be provided on Oak Meadow Drive at the western access proposed for the apartments.

In large part, economic and market considerations will dictate the pace and timing with which the proposed project is actually completed. The analyses conducted within this study are based on the estimation that the entire project will be completed within two years.

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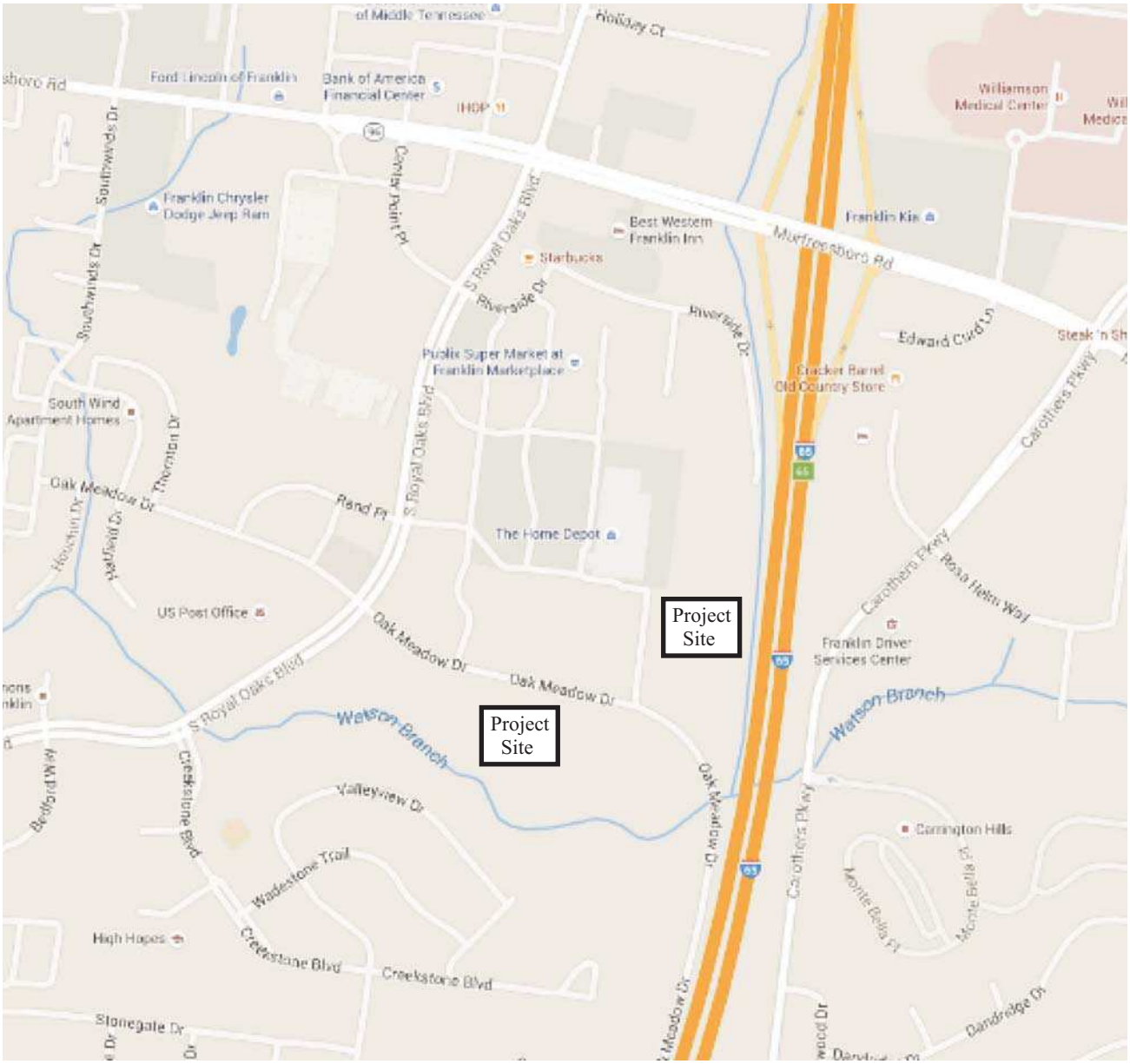

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No Scale

Figure 1.
Location of the Project Site

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N83°48'10"W	161.22'
L2	S61°46'08"W	106.65'
L3	S86°48'30"W	198.12'
L4	N65°28'52"W	120.02'
L5	N24°43'04"W	244.21'
L6	N84°36'00"W	115.35'
L7	N52°04'01"W	87.70'
L8	N57°18'12"W	163.19'
L9	N29°52'55"W	101.80'
L10	N74°02'09"W	41.15'
L11	N48°56'27"W	137.25'
L12	S88°57'25"W	67.60'
L13	S10°32'54"W	26.12'

LINE TABLE		
LINE	BEARING	DISTANCE
L14	S74°19'35"W	89.75'
L15	N75°22'06"W	55.08'
L16	N62°35'03"W	10.27'
L17	N39°40'55"E	27.30'
L18	S89°07'57"E	31.47'
L19	N25°32'12"E	70.78'
L20	N10°00'40"W	49.37'
L21	N54°59'41"E	103.02'
L22	N40°36'36"E	74.71'
L23	N53°28'05"E	164.68'

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C5	820.00'	330.94'	23°07'24"	167.75	328.69'	S65°21'21"E
C6	537.96'	464.57'	49°28'46"	247.89	450.27'	S52°10'40"E

TOTAL OF 98 UNITS ON SOUTH PARCEL

0 40 80 160
GRAPHIC SCALE

N

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1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
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WWW.CRUNKENG.COM

ENGINEERING CRUNK

WILSON COUNTY TENNESSEE AGRICULTURE
JAMES C. No. 114180 STATE OF TENNESSEE
5/9/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C2.2

SOUTH SITE DEVELOPMENT PLAN

SOUTH PROPERTY
17.33 ACRES AFTER
SUBDIVISION
98 UNITS

ASSISTED LIVING CENTER
(UNDER CONSTRUCTION)
ZONE GC

HOME
DEPOT
ZONE GC

ELK LODGE
ZONE GO

40 FT FRONT SETBACK

EXISTING 20' PUDE

52 UNITS
4 STORY

44 UNITS
4 STORY

44 UNITS
4 STORY

60 UNITS
4 STORY

2 UNITS
2 STORY

2 UNITS
2 STORY

TRASH
COMPACTOR AND
ENCLOSURE

MAINTENANCE
BUILDING

OFFICE
BUILDINGS
ZONE GC

EXISTING 20' PUDE

40 FT FRONT SETBACK

STORMWATER
DETENTION/TREATMENT
AREA

40 FT INTERSTATE
BUFFER

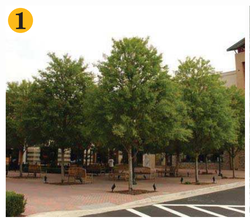
EXISTING TVA
EASEMENT

NORTH PROPERTY
13.06 ACRES
204 UNITS

EXISTING 20' PUDE

RIVERSIDE DR.

INTERSTATE-65



TOTAL OF 204 UNITS ON NORTH PARCEL

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	50.00'	123.89'	141°58'19"	145.10	94.54'	S77°58'06"W
C2	607.96'	443.66'	41°48'42"	232.23	433.88'	N51°57'06"W
C3	11300.00'	470.04'	2°23'00"	235.06	470.01'	S05°13'09"W
C4	11300.00'	112.73'	0°34'18"	56.37	112.73'	S06°41'48"W

0 30 60 120
GRAPHIC SCALE

N

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LANDSCAPE
ARCHITECT
AGRICULTURE
COMMERCE
No. 114180
STATE OF TENNESSEE
5/9/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C2.1

NORTH SITE
DEVELOPMENT
PLAN

SITE DATA TABLE

15,000 SQ-FT RETAIL SPACE
REQUIRED PARKING (3 SPACES PER 1,000 SQ-FT) = 45
PROVIDED PARKING = 55 SPACES
PROPOSED PROPERTY AREA = 3.5± ACRES

S. ROYAL OAKS BLVD

OAK MEADOWS DR.

BUILDING SETBACK

434.01

98.80

220.09

We understand this connection may not be possible, which is why we are proposing access into the Epoch Development site.

New Left Turn Lane

Existing driveway serving Post Office

Full access intersection proposed

60.0 FT

15,000 SQ-FT
RETAIL BUILDING

DETENTION
AREA

DUMPSTER

RETAINING WALL

60-FT STREAM BUFFER

EXISTING STREAM

PROPOSED
PROPERTY LINE

Epoch Development Site

100-YR FLOOD PLAIN

WATSON BRANCH

0 10 20 30 60
GRAPHIC SCALE

N

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PROPOSED RETAIL SITE
AT
ROYAL OAKS & OAK MEADOWS DRIVE
FRANKLIN, TN

REVISIONS

No.	DATE

04/27/15 15001

C1.0
SCHEMATIC
SITE PLAN
OVERALL

3. EXISTING TRAFFIC VOLUMES

In order to quantify the impact of the traffic that will be generated by the proposed project, peak hour traffic volumes were counted at the following locations:

1. Oak Meadow Drive and the project accesses
2. S. Royal Oaks Boulevard and Oak Meadow Drive
3. S. Royal Oaks Boulevard and Rand Place / Access for Home Depot
4. S. Royal Oaks Boulevard and Riverside Drive / Center Point Place

Also, the City of Franklin requested that peak hour traffic counts be collected for signal timing purposes at the following intersections:

5. Murfreesboro Road and Royal Oaks Boulevard
6. Murfreesboro Road and the Ramps for Southbound I-65
7. Murfreesboro Road and the Ramps for Northbound I-65

This data was collected during the morning and afternoon peak hours on typical weekdays in February 2016 when schools were in session. The raw traffic volumes are included in Appendix B. The existing laneage at the intersections within the study area is shown in Figure 3, and the existing peak hour traffic volumes are shown in Figure 4.

Using the existing peak hour traffic volumes shown in Figure 4, capacity analyses were conducted for the intersections counted. Specifically, in order to identify current peak hour levels of operation within the study area, the capacity calculations were performed according to the methods outlined in the Highway Capacity Manual 2010 (HCM2010). These analyses result in the determination of a Level of Service (LOS), which is a measure of evaluation is used to describe how well an intersection or roadway operates. LOS A represents free flow traffic operations, and LOS F suggests that the traffic demand exceeds the available capacity. In an urbanized area, LOS D is typically considered to be the minimum acceptable LOS. Table 1 presents the descriptions of LOS for signalized intersections, and Table 2 presents the descriptions of LOS for unsignalized intersections.

It is important to note that the City of Franklin Engineering Department provided the Synchro software files that were used to identify existing operations at the signalized intersections within the study area. Specifically, the files were updated to include the February 2016 traffic volumes. Also, the files were updated to reflect the recently-approved City ordinance that prohibits right-turns-on-red for the northbound right turns on S. Royal Oaks Boulevard at Murfreesboro Road.

The results of the capacity analyses for the existing peak hour traffic volumes are shown in Table 3, and Appendix C includes the capacity analyses worksheets.

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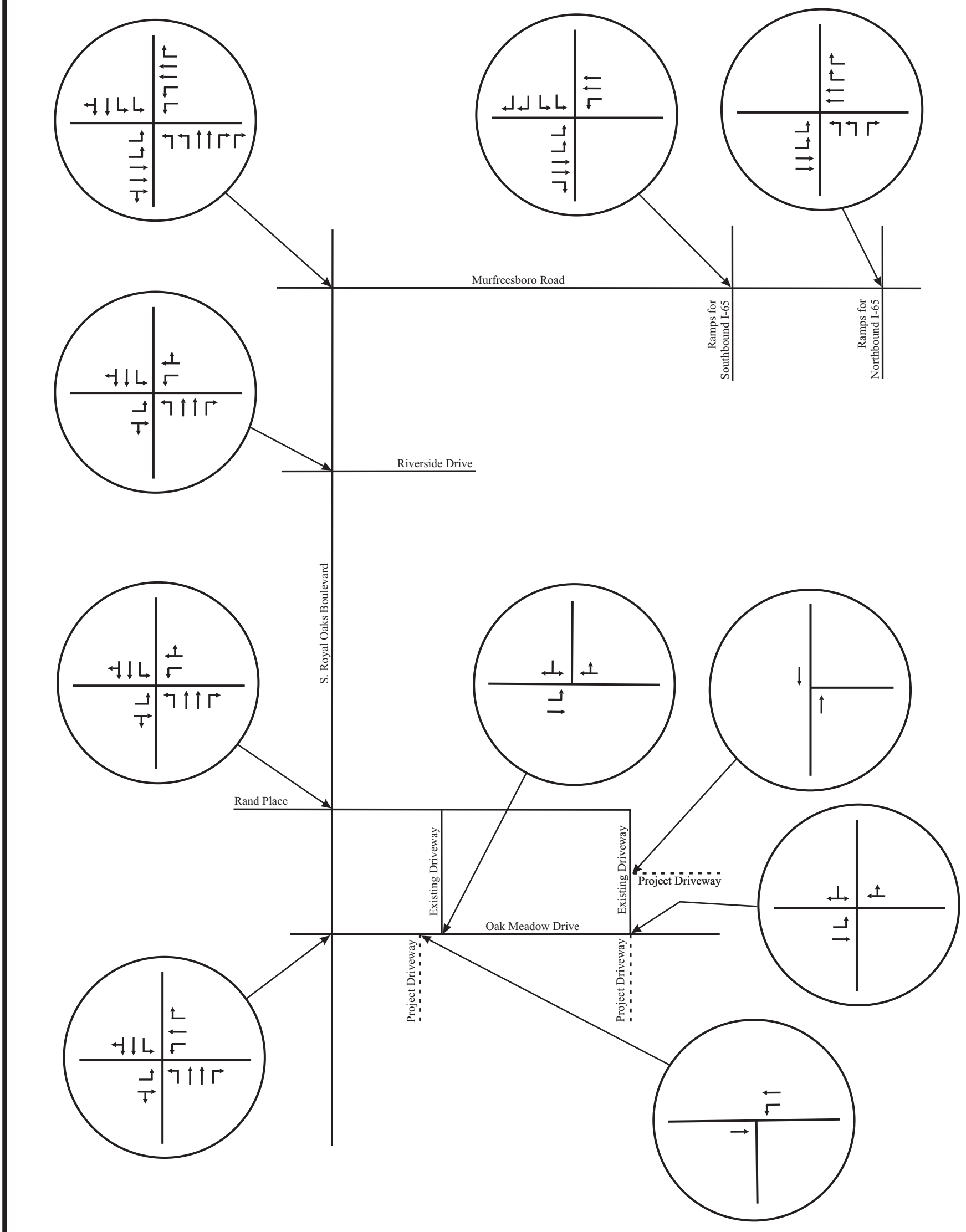

Figure 3.
Existing Laneage at the Intersections within the Study Area

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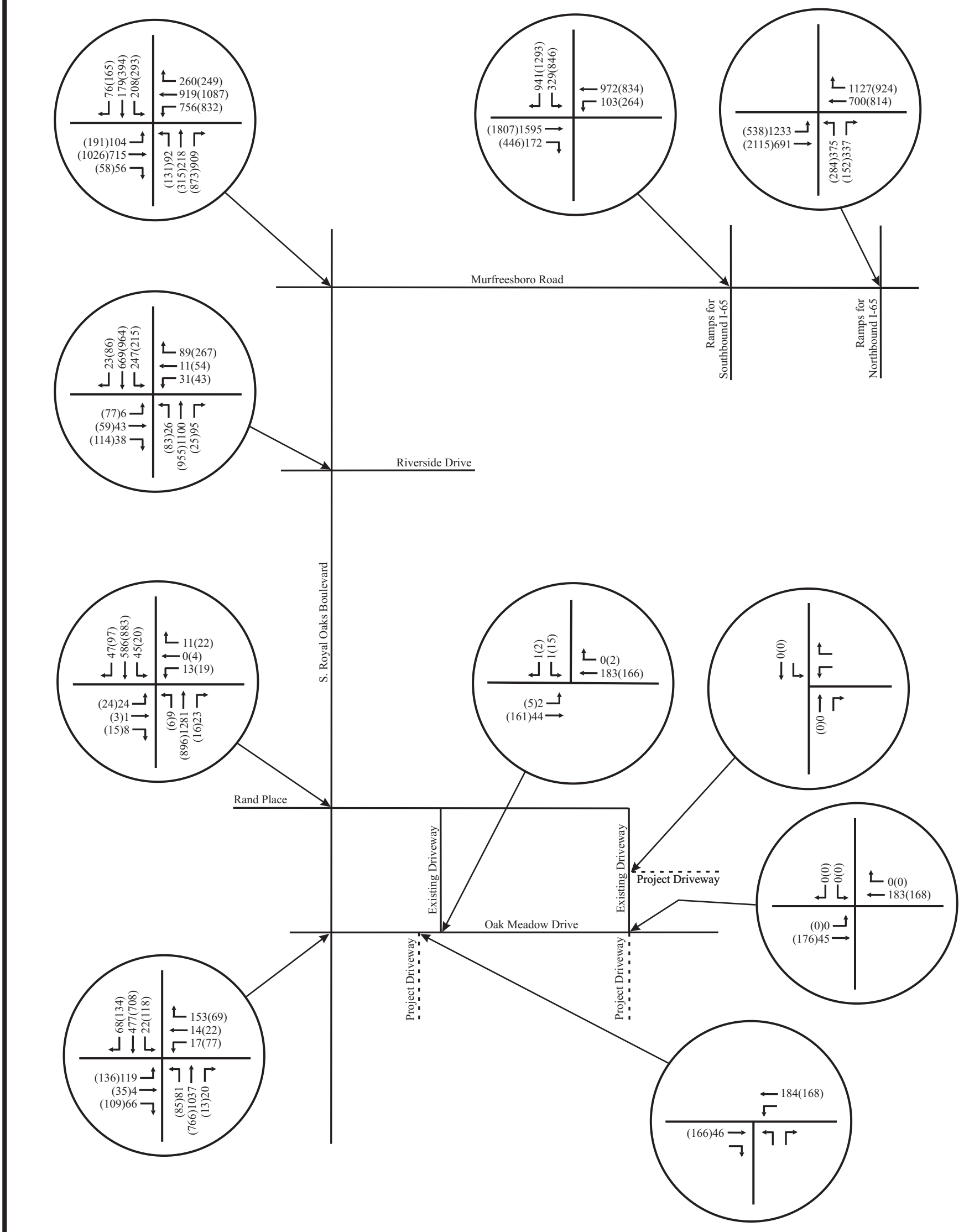

Figure 4.
Existing Peak Hour Traffic Volumes within the Study Area

TABLE 1. DESCRIPTIONS OF LOS FOR SIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay per Vehicle (sec)
A	Operations with very low control delay. Progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	Operations with stable flows. This generally occurs with good progression, short cycle lengths, or both. More vehicles stop than for LOS A, causing higher levels of average delay.	> 10 and ≤ 20
C	Operations with stable flow. Occurs with fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	> 20 and ≤ 35
D	Approaching unstable flow. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop.	> 35 and ≤ 55
E	Unstable flow. In many cases, this is considered to be the limit for acceptable delay. These high delays generally indicate poor progression, long cycle lengths, and high v/c ratios.	> 55 and ≤ 80
F	Unacceptable delay. This condition often occurs with oversaturation or with high v/c ratios. Poor progression and long cycle lengths may also cause such delay levels.	> 80

Source: Highway Capacity Manual 2010 (HCM2010)

TABLE 2. DESCRIPTIONS OF LOS FOR UNSIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay (sec/veh)
A	Minimal delay	≤ 10
B	Brief delay	> 10 and ≤ 15
C	Average delay	> 15 and ≤ 25
D	Significant delay	> 25 and ≤ 35
E	Long delay	> 35 and ≤ 50
F	Extreme delay	> 50

Source: Highway Capacity Manual 2010 (HCM 2010)

TABLE 3. EXISTING PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
Oak Meadow Drive and the Eastern Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
Oak Meadow Drive and the Western Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	32 feet	LOS B	47 feet
	Northbound Thrus	LOS B	308 feet	LOS B	268 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	12 feet	LOS A	64 feet
	Southbound Thrus/Right Turns	LOS A	130 feet	LOS C	356 feet
	Eastbound Left Turns	LOS D	120 feet	LOS D	137 feet
	Eastbound Thrus/Right Turns	LOS B	13 feet	LOS C	63 feet
	Westbound Left Turns	LOS C	27 feet	LOS D	82 feet
	Westbound Thrus	LOS D	25 feet	LOS D	35 feet
	Westbound Right Turns	LOS B	88 feet	LOS A	33 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS D	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS B	1 veh

	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS B	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	11 feet	LOS B	55 feet
	Northbound Thrus	LOS B	320 feet	LOS C	464 feet
	Northbound Right Turns	LOS A	26 feet	LOS A	0 feet
	Southbound Left Turns	LOS D	161 feet	LOS C	91 feet
	Southbound Thrus/Right Turns	LOS A	85 feet	LOS A	161 feet
	Eastbound Left Turns	LOS D	18 feet	LOS F	214 feet
	Eastbound Thrus/Right Turns	LOS D	99 feet	LOS C	141 feet
	Westbound Left Turns	LOS E	58 feet	LOS D	70 veh
	Westbound Thrus/Right Turns	LOS B	24 feet	LOS D	255 veh
	Overall Intersection	**LOS B**		**LOS C**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	88 feet	LOS E	144 feet
	Eastbound Thrus / Right Turns	LOS D	310 feet	LOS D	336 feet
	Westbound Left Turns	LOS D	412 feet	LOS F	499 feet
	Westbound Thrus	LOS D	539 feet	LOS D	492 feet
	Westbound Right Turns	LOS A	80 feet	LOS B	120 feet
	Northbound Left Turns	LOS E	73 feet	LOS E	103 feet
	Northbound Thrus	LOS D	146 feet	LOS E	218 feet
	Northbound Right Turns	LOS C	567 feet	LOS D	617 feet
	Southbound Left Turns	LOS E	148 feet	LOS F	242 feet

	Southbound Thrus / Right Turns	LOS D	141 feet	LOS E	398 feet
	Overall Intersection	**LOS D**		**LOS E**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	330 feet	LOS E	609 feet
	Eastbound Right Turns	LOS A	51 feet	LOS C	265 feet
	Westbound Left Turns	LOS E	156 feet	LOS F	465 feet
	Westbound Thrus	LOS B	273 feet	LOS C	337 feet
	Southbound Left Turns	LOS D	164 feet	LOS D	465 feet
	Southbound Right Turns	LOS E	617 feet	LOS F	1065 feet
	Overall Intersection	**LOS C**		**LOS E**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	913 feet	LOS E	341 feet
	Eastbound Thrus	LOS A	71 feet	LOS C	370 feet
	Westbound Thrus	LOS D	337 feet	LOS C	406 feet
	Westbound Right Turns	LOS C	502 feet	LOS A	234 feet
	Northbound Left Turns	LOS F	302 feet	LOS E	201 feet
	Northbound Right Turns	LOS C	225 feet	LOS D	172 feet
	Overall Intersection	**LOS E**		**LOS C**	

4. PROJECTION OF BACKGROUND TRAFFIC VOLUMES

In order to account for the traffic growth which will occur within the study area because of typical growth, background traffic volumes were established for the intersections within the study area. Specifically, in order to account for typical growth within the study area, consideration was given to the historical traffic volumes near the project site. The Tennessee Department of Transportation (TDOT) conducts an annual count program throughout the state. This count program includes the annual collection of average daily traffic (ADT) counts at numerous fixed locations. As shown in Table 4, the daily traffic volumes within the study area have increased 2.65% per year since 2006. Based on this information, for the purposes of this study, the existing traffic volumes at the intersections within the study area were increased by 8% to represent initial background traffic volumes in the Year 2018, as shown in Figure 5A.

TABLE 4. HISTORICAL TRAFFIC VOLUMES IN THE STUDY AREA

Year	Station 164 S. Royal Oaks Blvd ADT	Annual Growth	
2006	18,274		
2007	17,787	-2.66%	
2008	20,374	14.54%	
2009	19,666	-3.48%	
2010	19,324	-1.74%	
2011	19,090	-1.21%	
2012	19,435	1.81%	
2013	20,343	4.67%	
2014	22,118	8.73%	**Overall Growth**
2015	22,638	2.35%	**2.65%**

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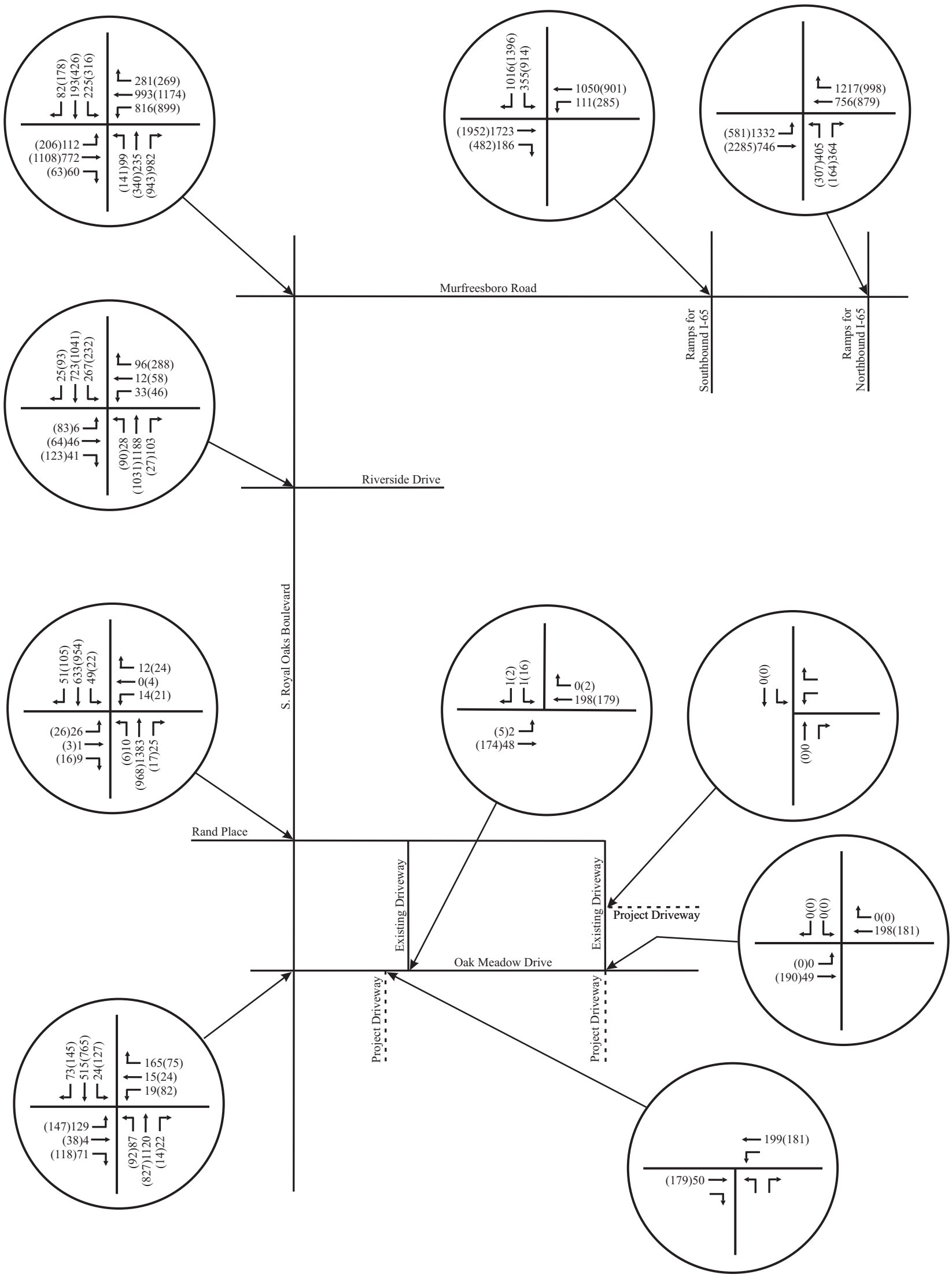

Figure 5A.
Initial Background Peak Hour Traffic Volumes within the Study Area

It is important to note that a day care center is under construction on the north side of S. Royal Oaks Boulevard at Mack Hatcher Parkway, southwest of the proposed project. It is likely that a significant portion of the traffic that will be generated by the day care center will be pass-by traffic that is already traveling on the S. Royal Oaks Boulevard corridor. The 8% growth rate applied to the existing traffic volumes will account for the additional traffic that will be generated by the day care center.

Also, it is important to note that an assisted living facility with 208 beds is under construction on the north side of Oak Meadow Drive, opposite the southern project site for the proposed project. For the purposes of this study, trip generation calculations were conducted in order to identify how much traffic is expected to be generated by the assisted living facility. Trip generation data for daily and peak hour trips were identified from Trip Generation, Ninth Edition, which was published by the Institute of Transportation Engineers (ITE) in 2012. Table 5 presents the daily and peak hour trip generations, and these calculations are included in Appendix D.

TABLE 5. TRIP GENERATION (SOMERBY ASSISTED LIVING FACILITY)

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Assisted Living Facility (LUC 254)	208 beds	570	34	13	30	47

Figures 5B and 5C include the directional distribution and assignment of peak hour traffic volumes that are expected to be generated by the assisted living facility.

The peak hour traffic volumes shown in Figures 5B and 5C were added to the traffic volumes shown in Figure 5A in order to establish the final background traffic volumes shown in Figure 5D. Using the background peak hour traffic volumes, capacity analyses were conducted for the intersections within the study area. For these analyses, it was assumed that all existing laneage and traffic control will be maintained and no improvements will be provided. The results of the capacity analyses for the background peak hour traffic volumes are shown in Table 5, and Appendix C includes the capacity analyses worksheets. These analyses indicate that the background conditions are consistent with the existing conditions within the study area.

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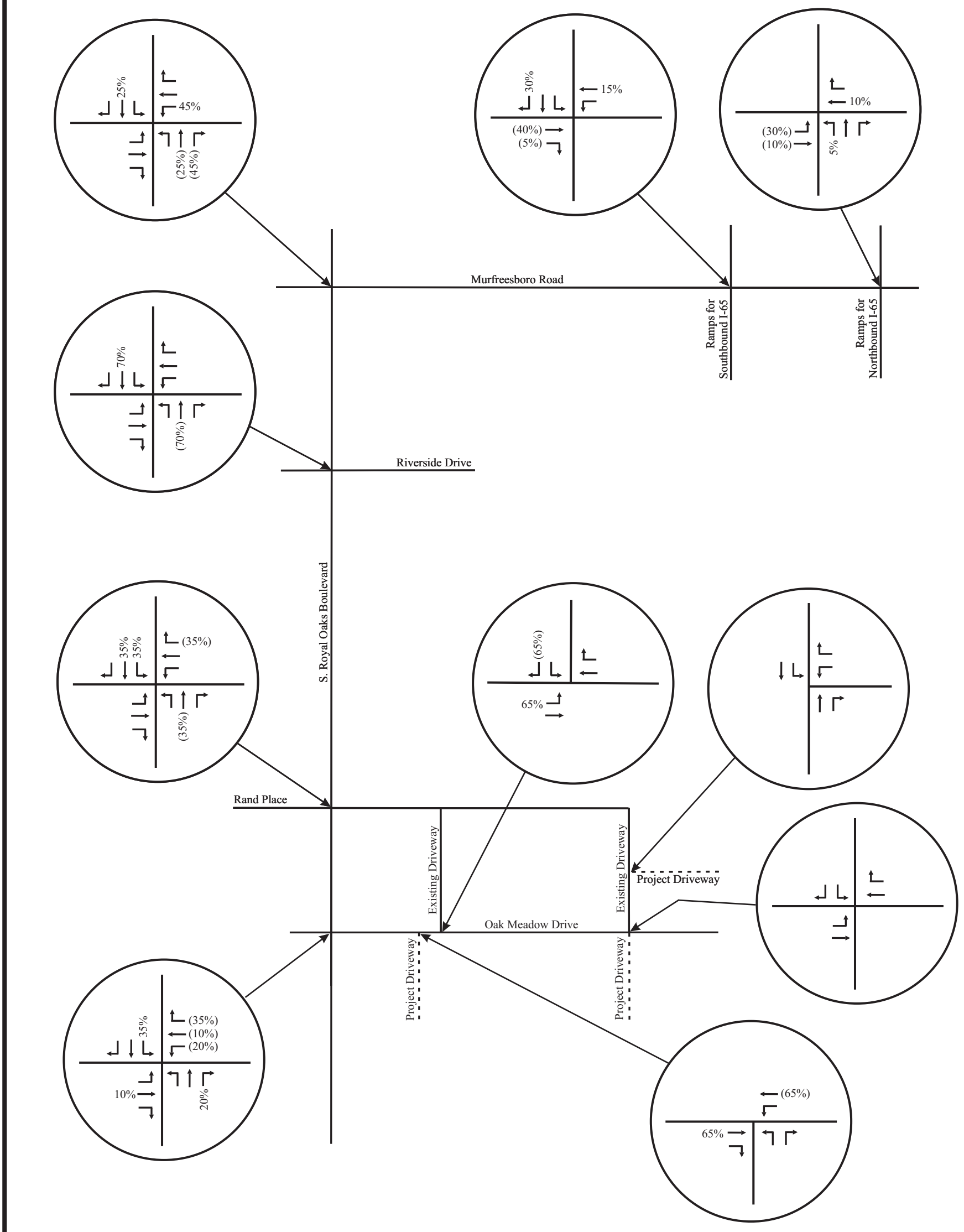

No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 5B.
Directional Distribution of Peak Hour Traffic Generated by the Somerby Assisted Living Facility

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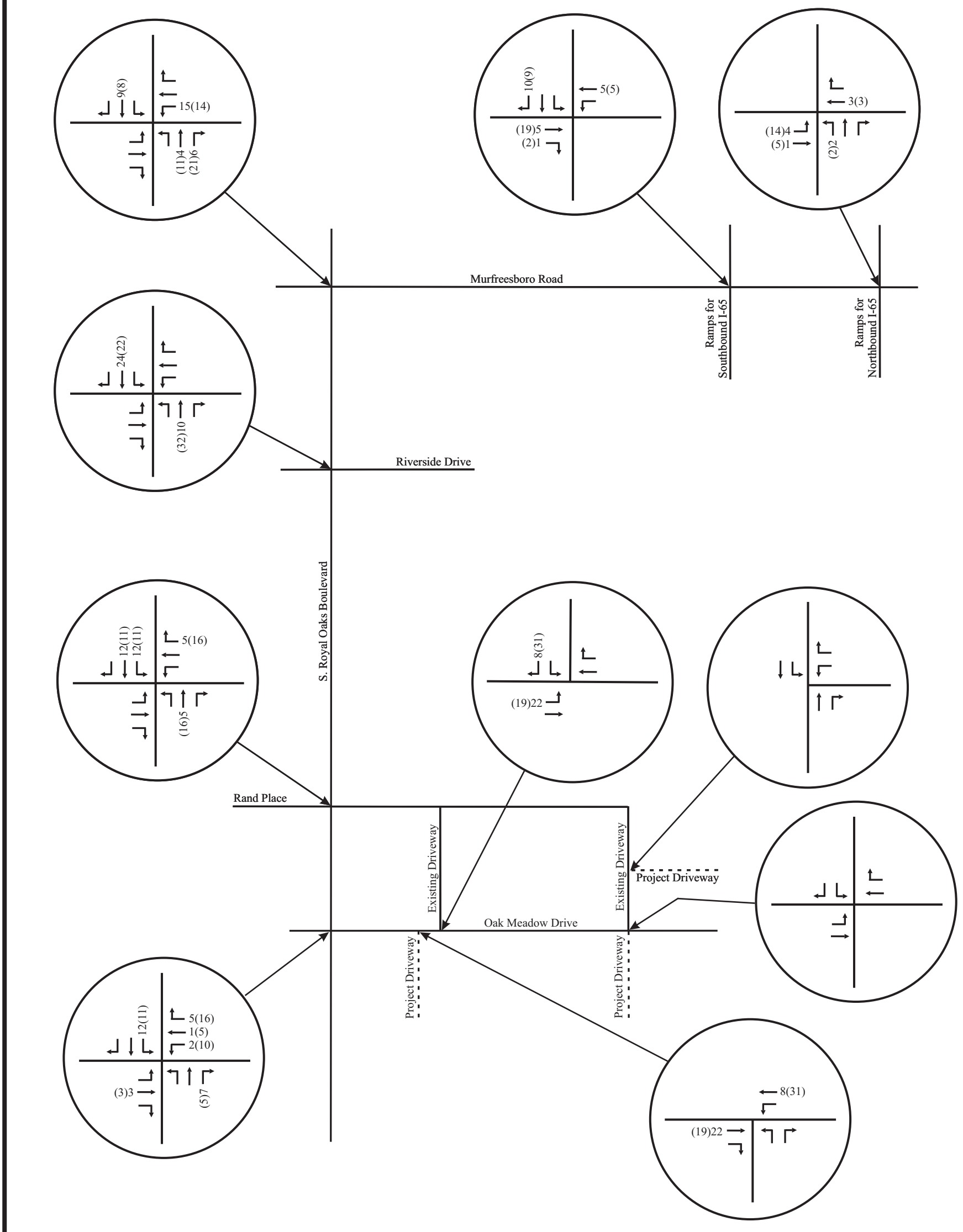

No Scale

N

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 5C.
Peak Hour Traffic Generated by the Somerby Assisted Living Facility

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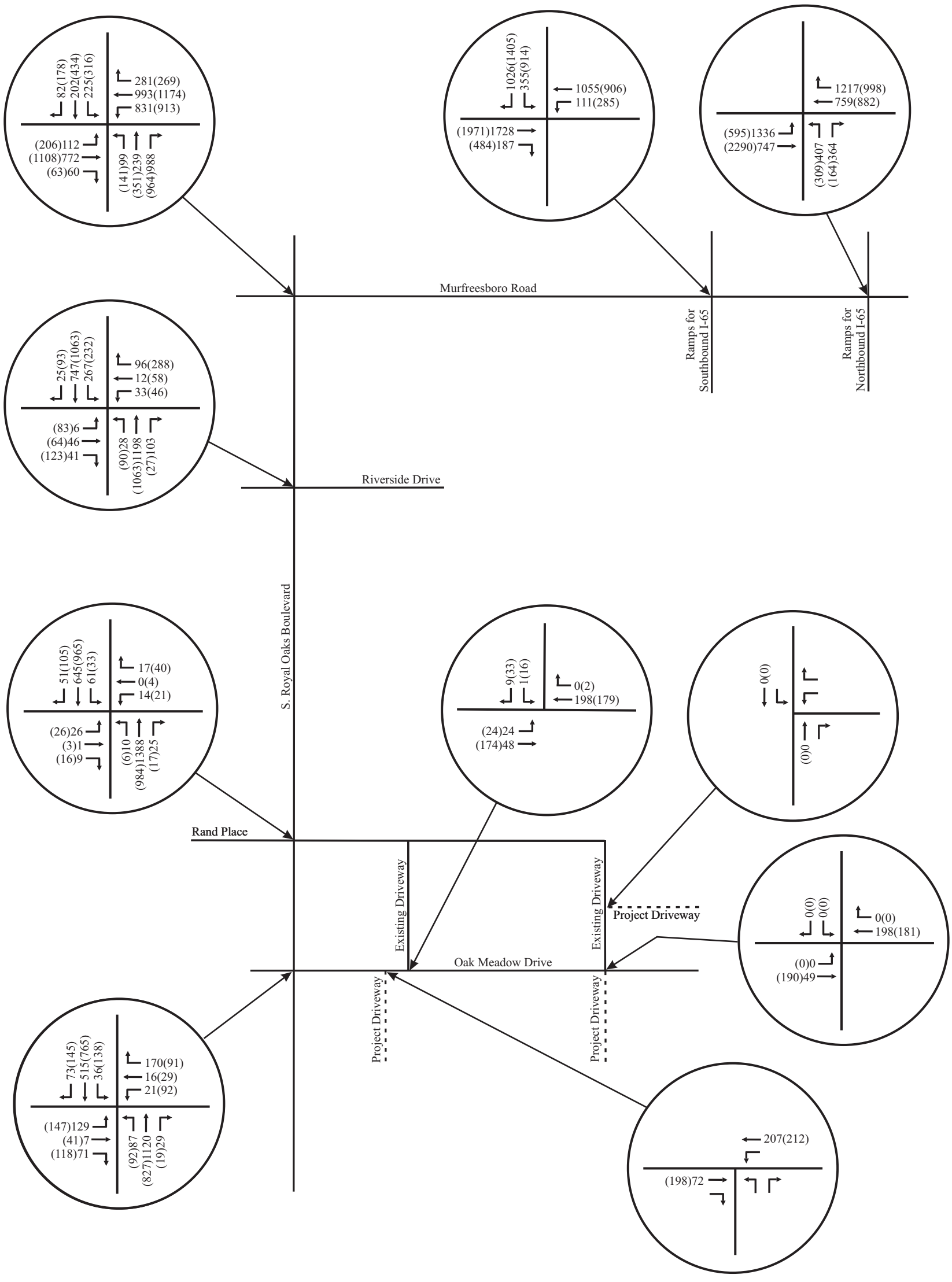
Traffic Engineering and Planning



No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 5D.
Final Background Peak Hour Traffic Volumes within the Study Area

TABLE 5. BACKGROUND PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
Oak Meadow Drive and the Eastern Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
Oak Meadow Drive and the Western Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	35 feet	LOS C	56 feet
	Northbound Thrus	LOS B	351 feet	LOS B	308 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	18 feet	LOS B	78 feet
	Southbound Thrus/Right Turns	LOS B	147 feet	LOS C	423 feet
	Eastbound Left Turns	LOS D	127 feet	LOS D	142 feet
	Eastbound Thrus/Right Turns	LOS B	15 feet	LOS D	80 feet
	Westbound Left Turns	LOS C	30 feet	LOS D	92 feet
	Westbound Thrus	LOS D	27 feet	LOS D	41 feet
	Westbound Right Turns	LOS B	110 feet	LOS A	37 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS D	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS C	1 veh

	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS C	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	12 feet	LOS B	59 feet
	Northbound Thrus	LOS B	374 feet	LOS C	538 feet
	Northbound Right Turns	LOS A	31 feet	LOS A	0 feet
	Southbound Left Turns	LOS E	192 feet	LOS D	112 feet
	Southbound Thrus/Right Turns	LOS A	228 feet	LOS A	351 feet
	Eastbound Left Turns	LOS D	18 feet	LOS F	217 feet
	Eastbound Thrus/Right Turns	LOS D	114 feet	LOS C	170 feet
	Westbound Left Turns	LOS E	60 feet	LOS D	74 veh
	Westbound Thrus/Right Turns	LOS B	24 feet	LOS D	289 veh
	Overall Intersection	**LOS B**		**LOS C**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	93 feet	LOS E	155 feet
	Eastbound Thrus / Right Turns	LOS D	338 feet	LOS D	369 feet
	Westbound Left Turns	LOS E	435 feet	LOS F	521 feet
	Westbound Thrus	LOS D	554 feet	LOS D	521 feet
	Westbound Right Turns	LOS A	109 feet	LOS B	130 feet
	Northbound Left Turns	LOS D	78 feet	LOS E	109 feet
	Northbound Thrus	LOS D	153 feet	LOS E	236 feet
	Northbound Right Turns	LOS D	655 feet	LOS D	692 feet
	Southbound Left Turns	LOS E	159 feet	LOS F	272 feet

	Southbound Thrus / Right Turns	LOS D	159 feet	LOS E	465 feet
	Overall Intersection	**LOS D**		**LOS E**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	388 feet	LOS E	672 feet
	Eastbound Right Turns	LOS A	50 feet	LOS C	295 feet
	Westbound Left Turns	LOS E	163 feet	LOS F	520 feet
	Westbound Thrus	LOS B	294 feet	LOS C	407 feet
	Southbound Left Turns	LOS D	178 feet	LOS D	515 feet
	Southbound Right Turns	LOS F	738 feet	LOS F	1235 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	1028 feet	LOS E	340 feet
	Eastbound Thrus	LOS A	76 feet	LOS C	518 feet
	Westbound Thrus	LOS D	372 feet	LOS C	467 feet
	Westbound Right Turns	LOS C	573 feet	LOS B	311 feet
	Northbound Left Turns	LOS F	337 feet	LOS E	218 feet
	Northbound Right Turns	LOS D	341 feet	LOS D	190 feet
	Overall Intersection	**LOS F**		**LOS C**	

5. IMPACTS OF PROPOSED DEVELOPMENT

5.1 TRIP GENERATION

Trip generation calculations were conducted in order to identify how much traffic will be generated by the proposed project. Trip generation data for daily and peak hour trips were identified from Trip Generation, Ninth Edition, which was published by the Institute of Transportation Engineers (ITE) in 2012. Table 6A presents the daily and peak hour trip generations for proposed townhomes, and these calculations are included in Appendix D.

TABLE 6A. TRIP GENERATION FOR THE PROPOSED PROJECT

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Multi-Family (LUC 220) **South Site**	98 units	652	10	40	39	21
Multi-Family (LUC 220) **North Site**	204 units	1,356	21	83	82	44
TOTAL	**302 units**	**2,008**	**31**	**123**	**121**	**65**
Future Commercial Development	15,000 sq.ft.	664	49	53	18	23

Also, trip generation calculations were conducted in order to identify how much traffic might be generated by office and retail land uses that could be developed on the project sites instead of multi-family residential. For purposes of these analyses, two land use scenarios were considered:

1. **40,000 sq.ft.** office space on the southern project site and **100,000 sq.ft** of office space on the northern project site

2. **30,000 sq.ft.** retail space on the southern project site and **60,000 sq.ft** of retail space on the northern project site

Table 6B presents the daily and peak hour trip generations for these alternative land uses.

TABLE 6B. TRIP GENERATION FOR ALTERNATIVE LAND USES

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Office (LUC 710)	140,000 sq.ft.	1,696	220	30	40	195
Retail (LUC 820)	90,000 sq.ft.	6,342	91	56	268	290

5.2 TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

For the purposes of this study, it was estimated that the trips generated by the proposed project and the future commercial development will access the project site according to the directional distribution shown in Figures 6A, 6B, and 6C. It is important to note that these directional distributions were prepared with input and approval from the City of Franklin Engineering Department and their third-party private consultant, Neel-Schaffer, Inc. The development of these distributions was based on the following factors:

- existing land use characteristics,
- the directions of approach of the existing traffic,
- the access proposed for the project, and
- the locations of population centers in the area.

The peak hour trip generations and directional distributions were used to add the site-generated trips to the roadway system. Figures 7A, 7B, 7C, and 7D include the peak hour traffic volumes that are expected to be generated by the proposed project and the future commercial development.

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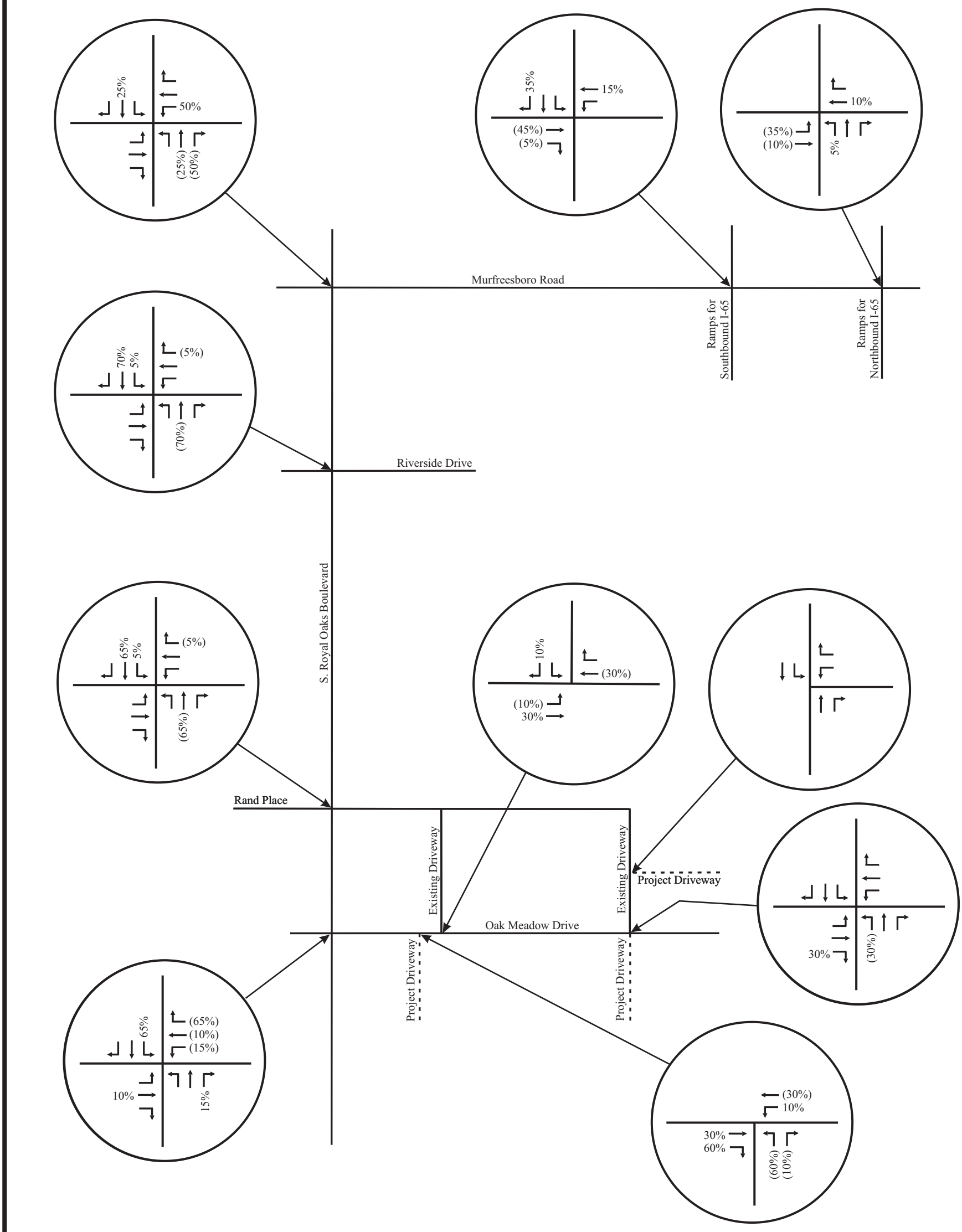

No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6A.
Directional Distribution of Peak Hour Traffic Volumes Generated by the Proposed Apartments (Southern Site)

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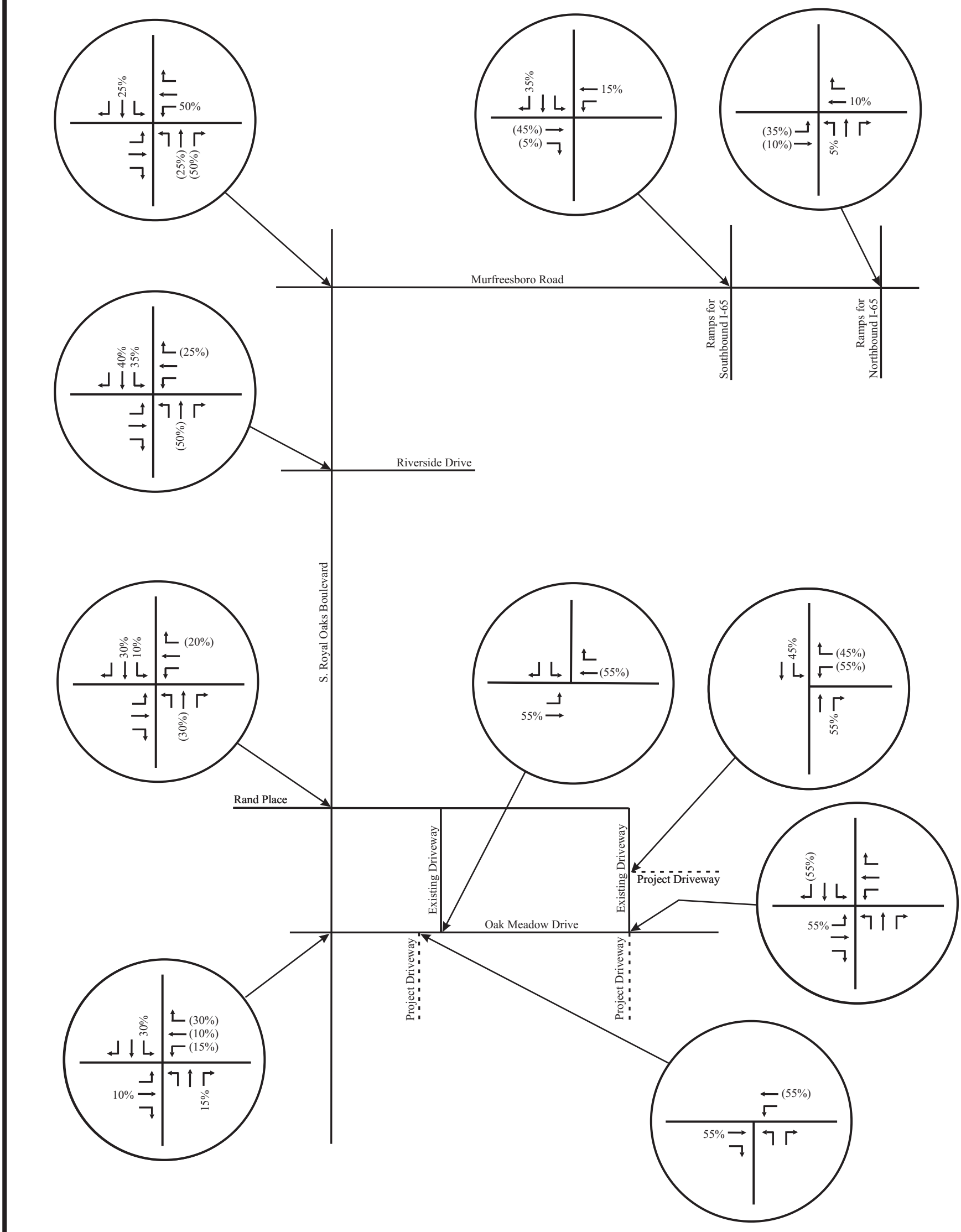
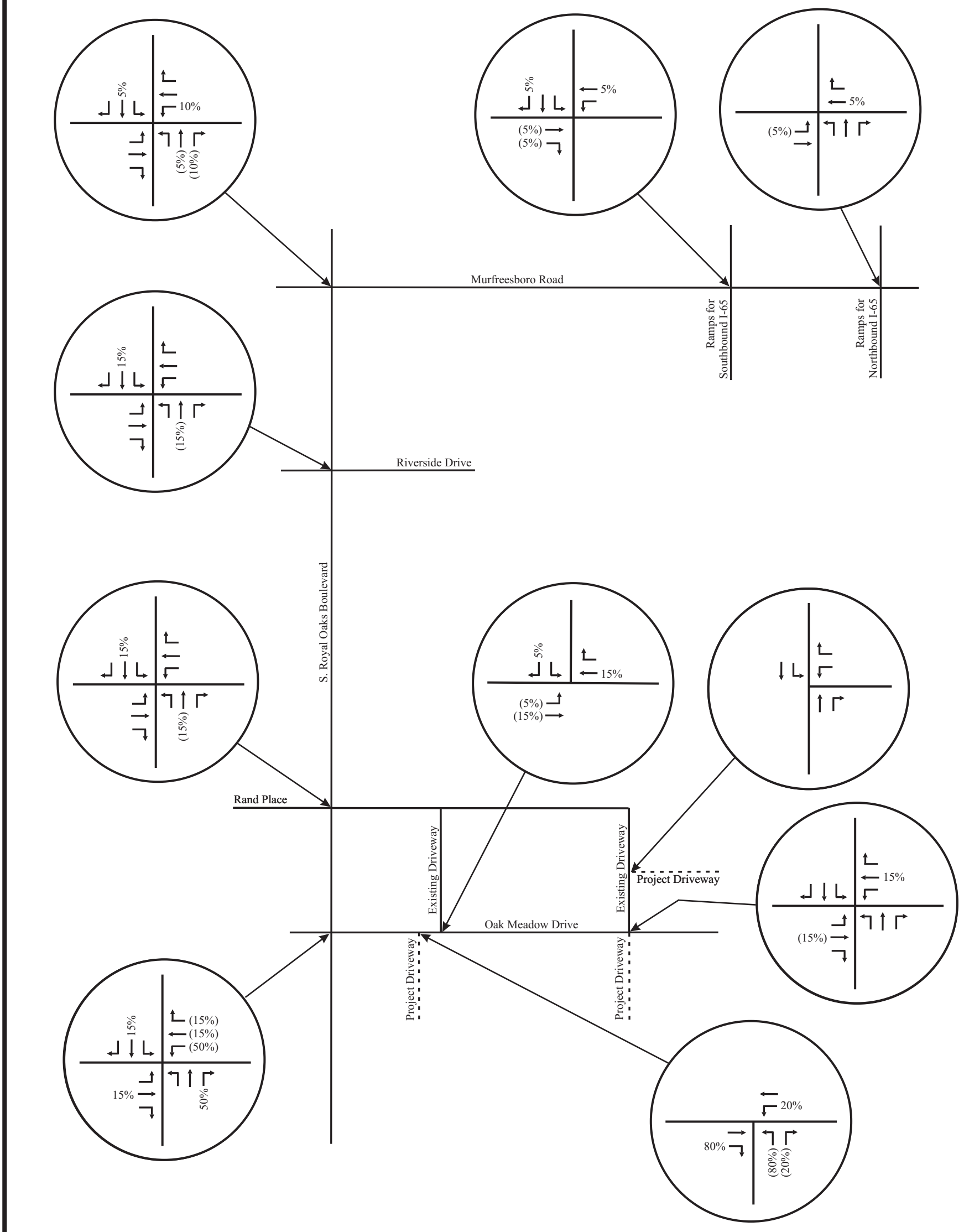


No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6B.
Directional Distribution of Peak Hour Traffic Volumes Generated by the Proposed Apartments (Northern Site)

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning



No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6C.
Directional Distribution of Peak Hour Traffic Volumes Generated by the Future Retail Center

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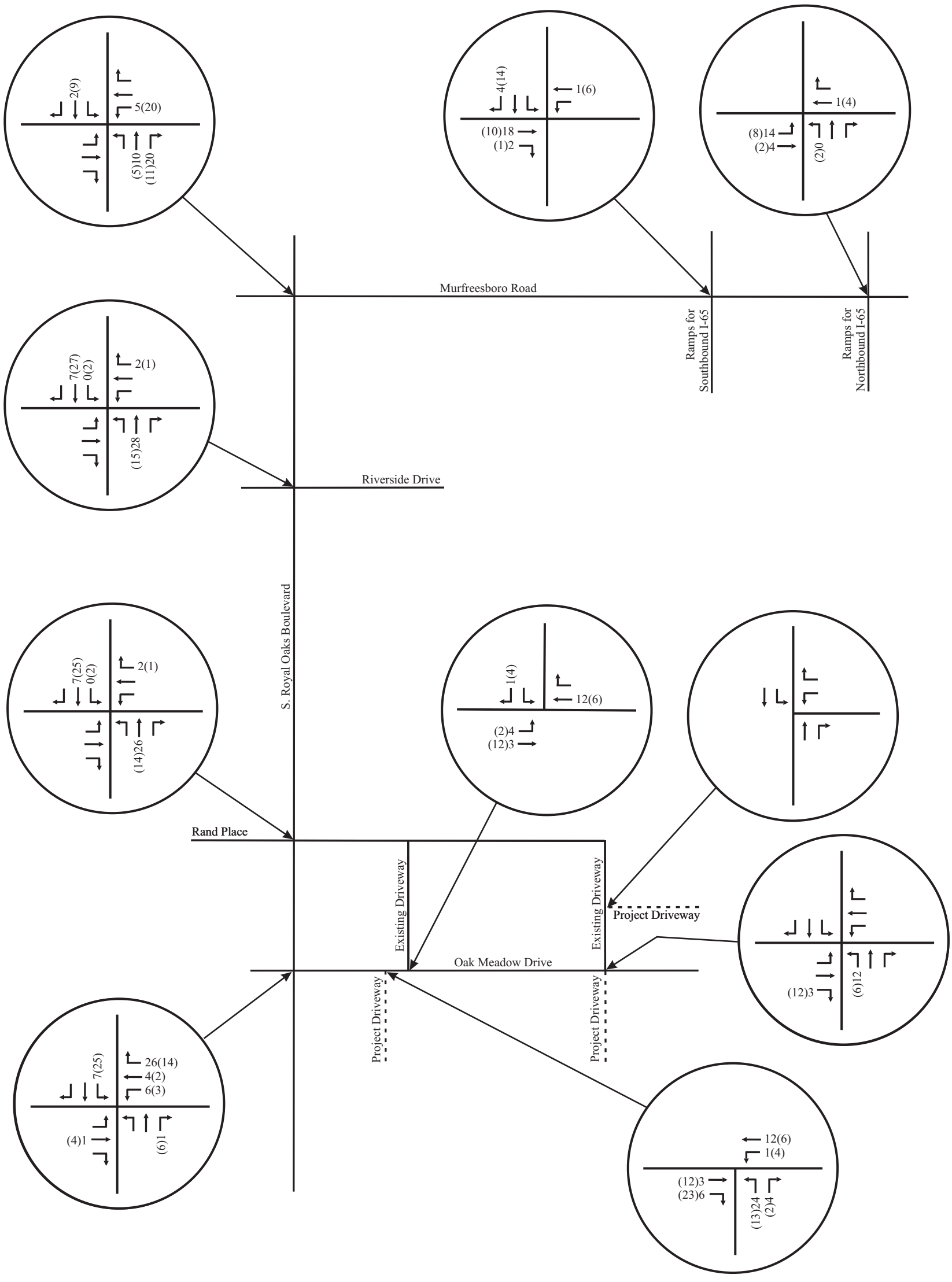


No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7A.
Peak Hour Traffic Volumes Generated by the Proposed Apartments (Southern Site)

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning

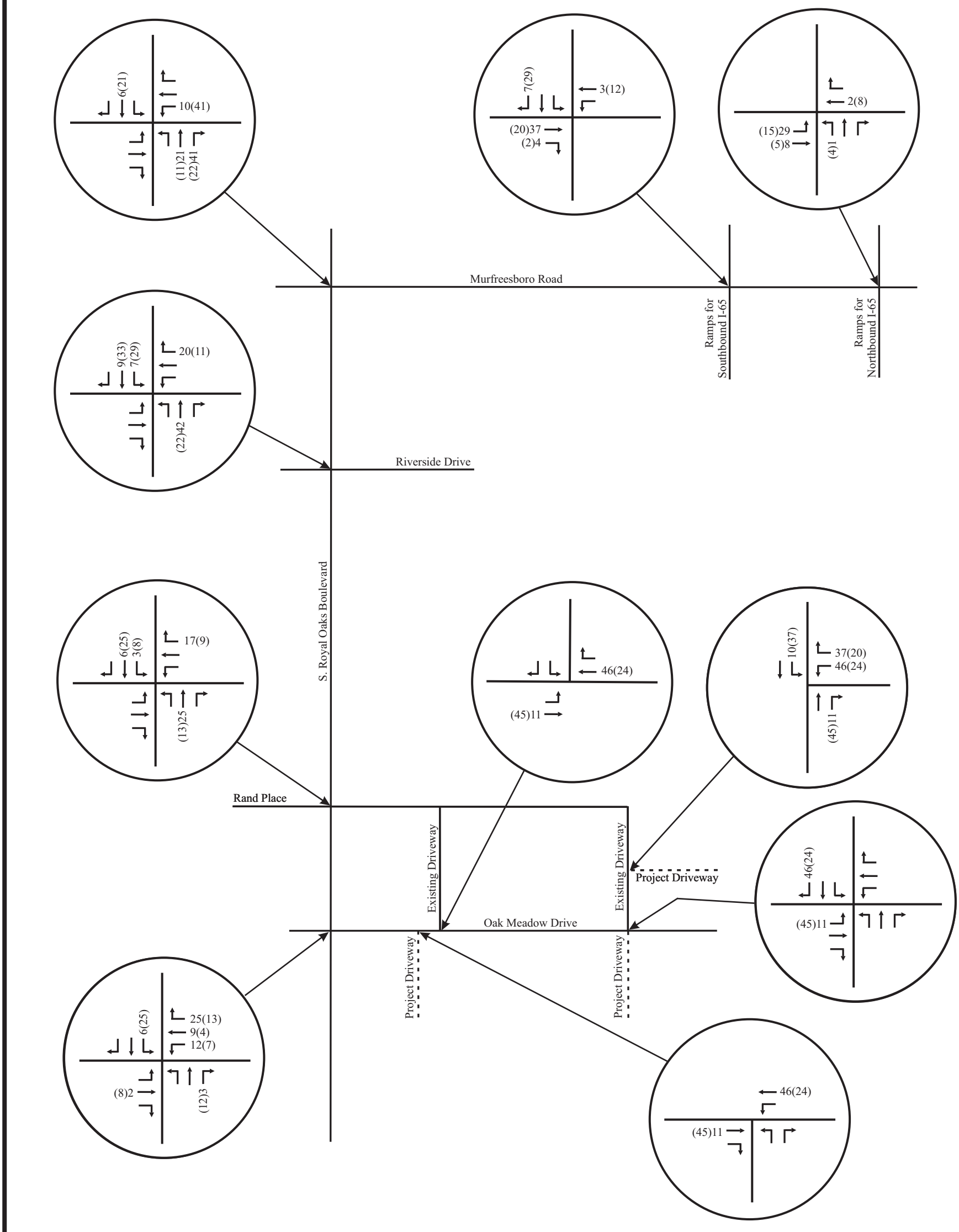
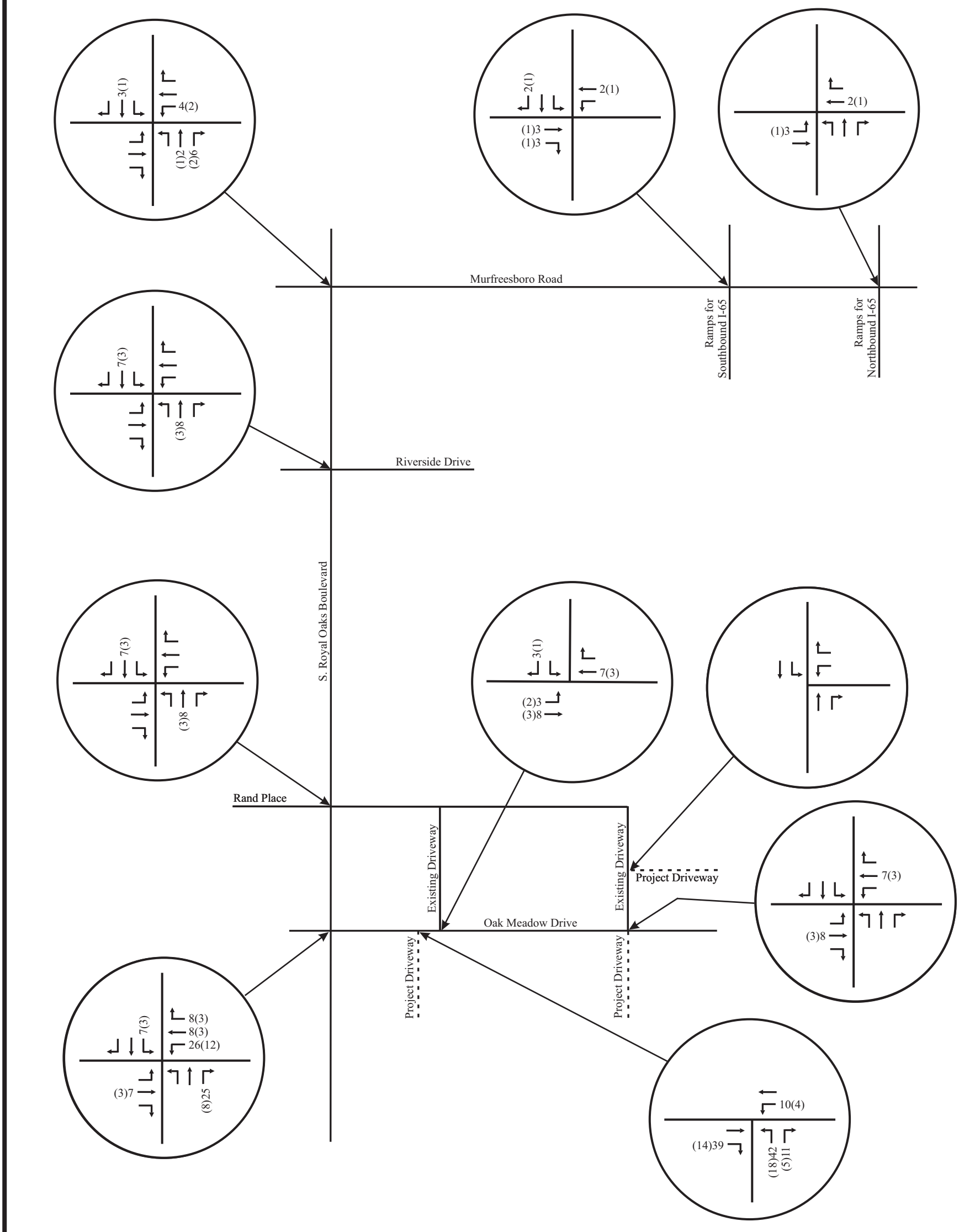


Figure 7B.
Peak Hour Traffic Volumes Generated by the Proposed Apartments (Northern Site)

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning



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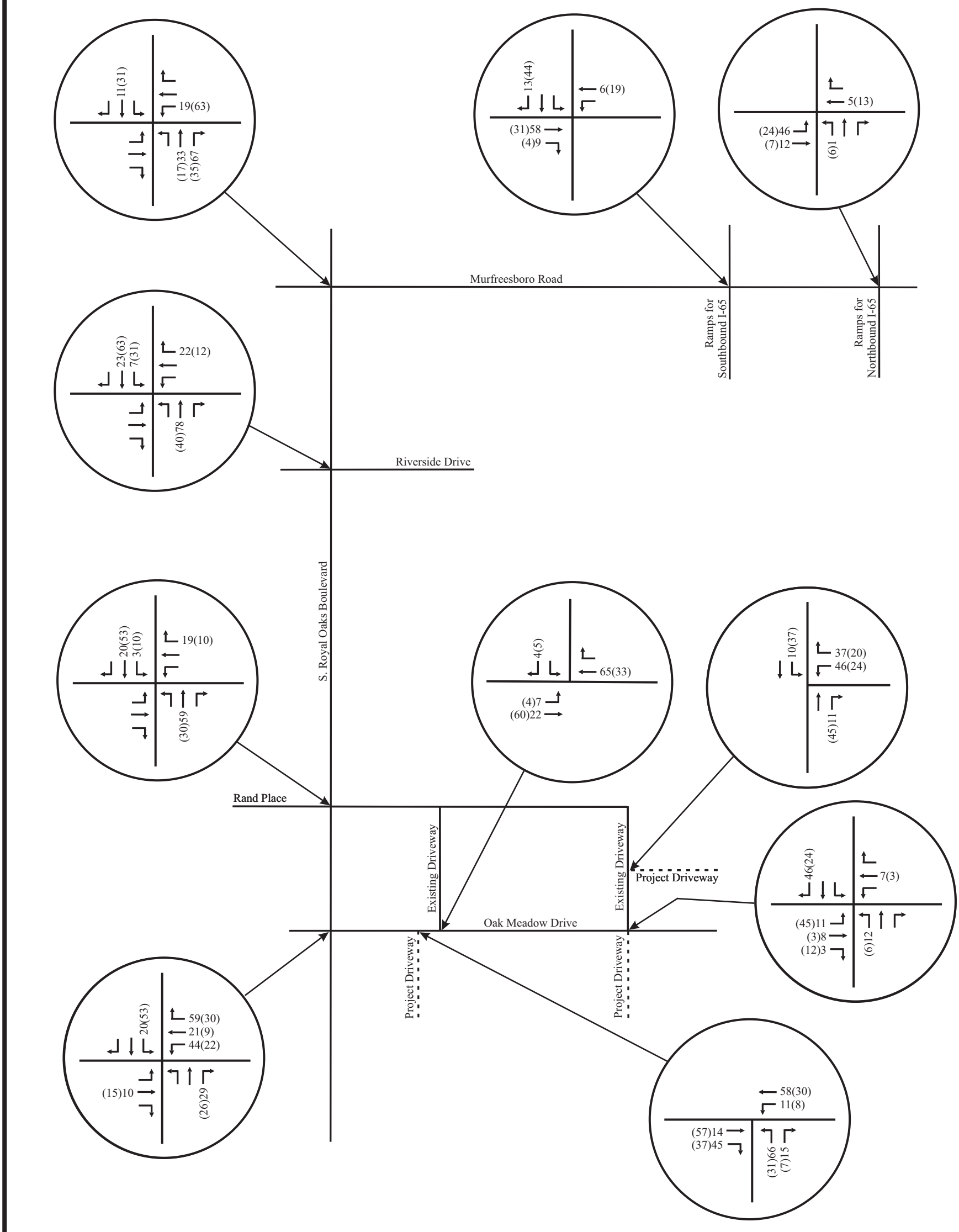
No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7C.
Peak Hour Traffic Volumes Generated by the Future Retail Center

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning



No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7D.
Total Peak Hour Traffic Volumes Generated by the Proposed Apartments (Total Both Sites) and Future Retail

5.3 CAPACITY ANALYSES

In order to identify the projected peak hour traffic volumes at the completion of the proposed project, the trips generated by the project were added to the background peak hour traffic volumes. The resulting peak hour volumes are shown in Figure 8.

Using the total projected peak hour traffic volumes, capacity analyses were conducted in order to determine the impact of the project on the roadway system. Specifically, these capacity analyses were used to evaluate the need for roadway and traffic control improvements within the study area. For these analyses, the following assumptions were made:

- All existing laneage and traffic control will be maintained and no improvements will be provided.

- Each of the project accesses on Oak Meadow Drive will be constructed to include one entering lane and one exiting lane.

- The access on S. Royal Oaks Boulevard for the future commercial project will be constructed to include one entering lane and two exiting lanes, striped as a separate left turn lane and a shared through/right turn lane.

The results of the capacity analyses for the total projected peak hour traffic volumes are shown in Table 7, and Appendix C includes the capacity analyses worksheets. These analyses indicate that the total projected conditions with full build-out of the project are consistent with the existing and background conditions within the study area.

Also, additional analyses were conducted in order to identify how well the intersection of S. Royal Oaks Boulevard and Riverside Drive / Center Point Place would operate if the traffic signal were modified to include protected signal phases for eastbound and westbound motorists. The results of these analyses are shown in Table 7, and Appendix C includes the capacity analyses worksheets. As shown, the additional signal phases would marginally reduce the level of service at this intersection during the PM peak hour.

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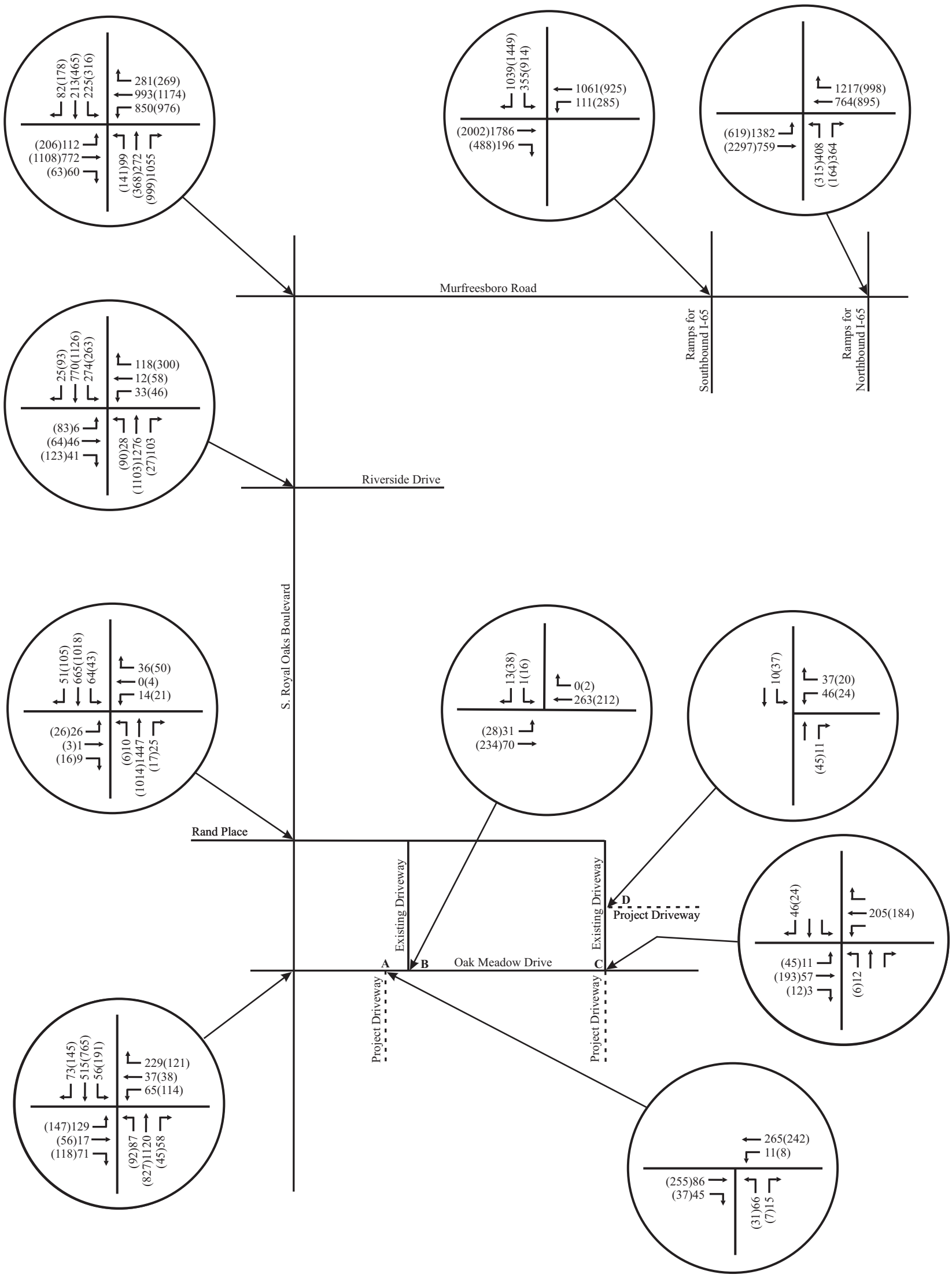


No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 8.
Total Projected Peak Hour Traffic Volumes at the Completion of the Proposed Apartments and Future Retail

TABLE 7. PROJECTED PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
A - Oak Meadow Drive and the Western Access for the Apartments / Retail	Westbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Northbound Left and Right Turns	LOS B	1 veh	LOS B	1 veh
B - Oak Meadow Drive and the Western Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS B	1 veh	LOS B	1 veh
C - Oak Meadow Drive and the Eastern Access for Home Depot / Apartments	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Westbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Northbound Left/Thru/Right Turns	LOS B	1 veh	LOS B	1 veh
	Southbound Left/Thru/Right Turns	LOS A	1 veh	LOS A	1 veh
D - Eastern Access for Home Depot / Access for Northern Apartments	Southbound Left Turns / Thrus	LOS A	1 veh	LOS A	1 veh
	Westbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	37 feet	LOS C	70 feet
	Northbound Thrus	LOS B	362 feet	LOS C	328 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	26 feet	LOS C	116 feet
	Southbound Thrus/Right Turns	LOS B	152 feet	LOS C	447 feet
	Eastbound Left Turns	LOS D	124 feet	LOS C	135 feet
	Eastbound Thrus/Right Turns	LOS B	22 feet	LOS D	108 feet
	Westbound Left Turns	LOS C	69 feet	LOS D	105 feet
	Westbound	LOS D	48 feet	LOS D	49 feet

	Thrus				
	Westbound Right Turns	LOS C	161 feet	LOS A	40 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS E	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS C	1 veh
	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS C	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	12 feet	LOS C	59 feet
	Northbound Thrus	LOS B	414 feet	LOS C	567 feet
	Northbound Right Turns	LOS A	31 feet	LOS A	0 feet
	Southbound Left Turns	LOS F	181 feet	LOS D	133 feet
	Southbound Thrus/Right Turns	LOS A	343 feet	LOS B	599 feet
	Eastbound Left Turns	LOS E	18 feet	LOS F	217 feet
	Eastbound Thrus/Right Turns	LOS D	114 feet	LOS C	176 feet
	Westbound Left Turns	LOS E	60 feet	LOS D	74 veh
	Westbound Thrus/Right Turns	LOS B	21 feet	LOS D	300 veh
	Overall Intersection	**LOS C**		**LOS C**	
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized and with protected left turn signal	Northbound Left Turns	LOS A	19 feet	LOS C	70 feet
	Northbound Thrus	LOS B	571 feet	LOS D	636 feet
	Northbound	LOS A	31 feet	LOS A	0 feet

phases for eastbound and westbound motorists)	Right Turns				
	Southbound Left Turns	LOS F	405 feet	LOS F	334 feet
	Southbound Thrus/Right Turns	LOS B	262 feet	LOS C	671 feet
	Eastbound Left Turns	LOS D	14 feet	LOS D	110 feet
	Eastbound Thrus/Right Turns	LOS E	105 feet	LOS D	181 feet
	Westbound Left Turns	LOS D	52 feet	LOS D	65 veh
	Westbound Thrus/Right Turns	LOS B	21 feet	LOS D	340 veh
	Overall Intersection	**LOS C**		**LOS D**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	93 feet	LOS E	155 feet
	Eastbound Thrus / Right Turns	LOS D	338 feet	LOS D	368 feet
	Westbound Left Turns	LOS E	446 feet	LOS F	567 feet
	Westbound Thrus	LOS D	544 feet	LOS D	517 feet
	Westbound Right Turns	LOS A	122 feet	LOS B	125 feet
	Northbound Left Turns	LOS D	76 feet	LOS E	105 feet
	Northbound Thrus	LOS D	174 feet	LOS E	249 feet
	Northbound Right Turns	LOS D	696 feet	LOS D	716 feet
	Southbound Left Turns	LOS E	159 feet	LOS F	272 feet
	Southbound Thrus / Right Turns	LOS D	167 feet	LOS F	505 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	406 feet	LOS E	692 feet
	Eastbound Right Turns	LOS A	47 feet	LOS C	295 feet
	Westbound	LOS E	164 feet	LOS F	521 feet

	Left Turns				
	Westbound Thrus	LOS B	297 feet	LOS C	430 feet
	Southbound Left Turns	LOS D	178 feet	LOS D	515 feet
	Southbound Right Turns	LOS F	754 feet	LOS F	1297 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	1078 feet	LOS E	344 feet
	Eastbound Thrus	LOS A	75 feet	LOS C	499 feet
	Westbound Thrus	LOS D	375 feet	LOS C	485 feet
	Westbound Right Turns	LOS C	573 feet	LOS B	327 feet
	Northbound Left Turns	LOS F	338 feet	LOS E	222 feet
	Northbound Right Turns	LOS E	351 feet	LOS D	190 feet
	Overall Intersection	**LOS F**		**LOS D**	

5.4 CAPACITY ANALYSIS COMPARISON

The results of the capacity analyses for the existing, background, and total projected peak hour traffic volumes are included in Tables 8 and 9 for comparison purposes. Also, the levels of service that worsen from background conditions to total projected conditions with the proposed project are highlighted in red. Finally, additional analyses were conducted in order to identify how well the intersections within the study area would operate if a third northbound through lane were provided on S. Royal Oaks between Oak Meadow Drive and Murfreesboro Road. Specifically, for these analyses, the northbound right turn lanes at Oak Meadow Drive, Rand Place, and Riverside Drive were converted to shared through/right turn lanes. Also, the analyses included the modification of the existing traffic signal at the intersection of S. Royal Oaks Boulevard and Riverside Drive / Center Point Place to include protected signal phases for eastbound and westbound motorists. The results of these additional analyses are shown in Tables 8 and 9. These comparisons and analyses that reveal poor levels of service are described below:

S. Royal Oaks Boulevard and Oak Meadow Drive
This intersection operates at LOS B during the AM peak hour and LOS C during the PM peak hour under existing, background, and total projected conditions.

S. Royal Oaks Boulevard and Riverside Drive / Center Point Place
This intersection operates at LOS B during the AM peak hour and LOS C during the PM peak hour under existing and background conditions. With the proposed project, this intersection will operate at LOS C during both peak hours. Also, if the existing traffic signal were modified to include protected signal phases for eastbound and westbound motorists, this intersection would operate at LOS C during the AM peak hour and LOS D during the PM peak hour.

Murfreesboro Road and Royal Oaks Boulevard
This intersection operates poorly during the PM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound throughs, westbound throughs, westbound left turns, and northbound right turns are all approximately equal during both peak hours. Although some of these turning movements can operate during the same signal phases, the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

Murfreesboro Road and the Ramps for Southbound I-65
This intersection operates poorly during the PM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound throughs, westbound throughs, and southbound right turns are all significantly high during both peak hours, and the traffic volume for the southbound left turns are significantly high during the PM peak hour. Although some of these turning movements can operate during the same signal phases, the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

Murfreesboro Road and the Ramps for Northbound I-65

This intersection operates poorly during the AM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound left turns and westbound right turns are significantly high during the AM peak hour, and the traffic volumes for the eastbound throughs and westbound right turns are significantly high during the PM peak hour. These turning movements cannot operate during the same signal phases, and the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

TABLE 8. COMPARISON OF AM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVELS OF SERVICE			
		EXISTING CONDITIONS	BACKGROUND CONDITIONS	TOTAL PROJECTED CONDITIONS	WITH THIRD NORTHBOUND TRAVEL LANE
S. Royal Oaks Boulevard and Oak Meadow Drive	Overall Intersection	LOS B (13.9 sec/veh)	LOS B (15.4 sec/veh)	LOS B (17.6 sec/veh)	LOS B (16.0 sec/veh)
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place	Overall Intersection	LOS B (14.0 sec/veh)	**LOS B** (17.3 sec/veh)	**LOS C** (20.5 sec/veh)	LOS C (30.8 sec/veh)
Murfreesboro Road and Royal Oaks Boulevard	Overall Intersection	LOS D (42.0 sec/veh)	LOS D (44.9 sec/veh)	LOS D (46.1 sec/veh)	LOS D (44.4 sec/veh)
Murfreesboro Road and Ramps for Southbound I-65	Overall Intersection	LOS C (31.7 sec/veh)	LOS D (39.6 sec/veh)	LOS D (41.2 sec/veh)	LOS D (41.6 sec/veh)
Murfreesboro Road and Ramps for Northbound I-65	Overall Intersection	LOS E (64.7 sec/veh)	LOS F (81.2 sec/veh)	LOS F (87.9 sec/veh)	LOS F (87.9 sec/veh)

TABLE 9. COMPARISON OF PM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVELS OF SERVICE			
		EXISTING CONDITIONS	BACKGROUND CONDITIONS	TOTAL PROJECTED CONDITIONS	WITH THIRD NORTHBOUND TRAVEL LANE
S. Royal Oaks Boulevard and Oak Meadow Drive	Overall Intersection	LOS C (21.9 sec/veh)	LOS C (25.3 sec/veh)	LOS C (28.1 sec/veh)	LOS C (26.9 sec/veh)
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place	Overall Intersection	LOS C (27.4 sec/veh)	LOS C (29.0 sec/veh)	**LOS C** (31.3 sec/veh)	**LOS D** (36.8 sec/veh)
Murfreesboro Road and Royal Oaks Boulevard	Overall Intersection	LOS E (61.2 sec/veh)	**LOS E** (72.3 sec/veh)	**LOS F** (80.6 sec/veh)	LOS E (78.8 sec/veh)
Murfreesboro Road and Ramps for Southbound I-65	Overall Intersection	LOS E (78.4 sec/veh)	LOS F (97.4 sec/veh)	LOS F (103.7 sec/veh)	LOS F (103.9 sec/veh)
Murfreesboro Road and Ramps for Northbound I-65	Overall Intersection	LOS C (29.5 sec/veh)	**LOS C** (34.2 sec/veh)	**LOS D** (35.1 sec/veh)	LOS D (35.1 sec/veh)

6. CONCLUSIONS AND RECOMMENDATIONS

The analyses presented in this study indicate the following information for the intersections that provide direct access to the project sites:

Oak Meadow Drive and the Western Project Access
At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the northbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low.

The existing center turn lane on Oak Meadow Drive should be restriped to provide a dedicated westbound left turn lane with 50 feet of storage for motorists turning onto the project access.

In order to identify the sight distances that will be available at the project access, sight triangles should be provided in conjunction with construction documents for the proposed project. These sight triangles should be developed based on guidelines that are included in A Policy on Geometric Design of Highways and Streets, which is published by the American Association of State Highway and Transportation Officials (AASHTO) and commonly known as The Green Book. Specifically, The Green Book indicates that for a speed of 40 mph, the minimum stopping sight distance is 305 feet. This is the distance that a motorist on Oak Meadow Drive needs to come to a stop if a vehicle turning from the project access creates a conflict. Also, based on The Green Book, the minimum intersection sight distance is 445 feet. This is the distance that a motorist exiting the project access needs to safely complete turns onto Oak Meadow Drive.

Oak Meadow Drive and the Western Home Depot Access
The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will remain very low. However, double yellow pavement markings should be provided on the Home Depot access in order to delineate travel lanes. Also, the existing center turn lane on Oak Meadow Drive should be restriped to provide a dedicated eastbound left turn lane with 50 feet of storage for motorists turning onto the Home Depot access.

Oak Meadow Drive and the Eastern Project Access / Home Depot Access
At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the northbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low.

At the completion of the proposed project, the existing double yellow pavement markings on the Home Depot access should be reapplied in order to delineate travel lanes. The existing center turn lane on Oak Meadow Drive should be restriped to provide a dedicated eastbound and westbound left turn lanes for motorists turning onto the Home Depot access and the project access. Each of these turn lanes should include at least 50 feet of storage.

In order to identify the sight distances that will be available at the project access, sight triangles should be provided in conjunction with construction documents for the proposed project. These sight triangles should be developed based on guidelines that are included in A Policy on Geometric Design of Highways and Streets, which is published by the American Association of State Highway and Transportation Officials (AASHTO) and commonly known as The Green Book. Specifically, The Green Book indicates that for a speed of 40 mph, the minimum stopping sight distance is 305 feet. This is the distance that a motorist on Oak Meadow Drive needs to come to a stop if a vehicle turning from the project access creates a conflict. Also, based on The Green Book, the minimum intersection sight distance is 445 feet. This is the distance that a motorist exiting the project access needs to safely complete turns onto Oak Meadow Drive.

Also, sight distance should be maximized for northbound/westbound motorists on Oak Meadow Drive by removing foliage and vegetation from the south side of Oak Meadow Drive.

Eastern Home Depot Access and the Project Access for the Northern Apartments

At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the westbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low. At the completion of the proposed project, the existing double yellow pavement markings on the Home Depot access should be reapplied in order to delineate travel lanes.

S. Royal Oaks Boulevard and Oak Meadow Drive

The capacity analyses indicate that all of the turning movements at this intersection will operate at acceptable levels of service. Also, the existing lengths of the turn lanes are adequate to accommodate the total projected traffic volumes with the completion of the proposed project. Finally, it is important to note that the westbound approach of Oak Meadow Drive already includes separate left, through, and right turn lanes at the intersection with S. Royal Oaks Boulevard, and the existing traffic signal already includes a right turn overlap signal phase for westbound motorists. Therefore, there are no additional dedicated turn lanes or traffic control modifications that can be provided at this location. Field observations and traffic counts confirm that the northbound and southbound through volumes are significant, particularly the northbound through movement during the AM peak hour. However, the proposed project will have a minimal impact on these conditions.

S. Royal Oaks Boulevard and Rand Place / Access for Home Depot

The capacity analyses indicate that all of the critical turning movements at this unsignalized intersection will operate at acceptable levels of service. Also, the existing lengths of the turn lanes are adequate to accommodate the total projected traffic volumes with the completion of the proposed project. Field observations and traffic counts confirm that the northbound and southbound through volumes are significant, particularly the northbound through movement during the AM peak hour. In addition, the field observations and traffic counts confirm that the eastbound and westbound left turn volumes are relatively low, presumably because left turns are challenging when the northbound and southbound through volumes are high. Finally, the

eastbound and westbound motorists have access to the existing traffic signal at Oak Meadow Drive. It is important to note that proposed project will have a minimal impact on these conditions. Also, it is important to note that this intersection is not an appropriate location for a traffic signal installation because of its proximity to the existing traffic signal at Oak Meadow Drive.

At the completion of the proposed project, the existing pavement markings on the Home Depot access should be reapplied in order to delineate travel lanes. At that time, consideration should be given to restriping the westbound travel lanes in order to provide a shared left turn / through lane and a separate right turn lane. This modification would reduce delays for the westbound right turns, which occur approximately twice as frequently as the westbound left turns.

S. Royal Oaks Boulevard and Riverside Drive / Center Point Place

The capacity analyses indicate that several turning movements at this intersection will operate at LOS C or better during both peak hours under existing, background, and total projected conditions. If the existing traffic signal were modified to include protected signal phases for eastbound and westbound motorists, this intersection would operate at LOS C during the AM peak hour and LOS D during the PM peak hour. However, this modification would reduce the potential for vehicle conflicts for eastbound and westbound motorists.

Also, it is important to note that the analyses indicate that providing a third northbound through lane on S. Royal Oaks Boulevard would not significantly reduce delays at this intersection.

Access for the Future Retail Site

Currently, the future retail parcel is not included in the site plan for the proposed apartments. Since building sizes, land uses, parking provisions, and driveways have not be established for this future development, no recommendations are made for the number and location of driveways or the laneage and traffic control that will be needed at the intersections that will provide access to the future retail development.

APPENDIX A
TRAFFIC IMPACT STUDY SCOPE PROVIDED BY
THE CITY OF FRANKLIN AND NEEL-SCHAFFER, INC.

Exhibit B

City of Franklin
Engineering Department

APPLICATION FORM
REQUEST FOR APPROVED TRANSPORTATION IMPACT ANALYSIS REPORT

APPROVED
By Carl Baughman at 4:26 pm, Jan 28, 2016

Applicant Name:	Crunk Engineering .	Applicant Name:	Epoch Residential .
Address:	1894 Gen. George Patton.	Address:	359 Carolina Avenue .
	Franklin, TN 37067 .		Winter Park, FL 32789 .
Phone #:	(615) 873-1795 .	Phone #:	(321) 316-6005 .
e-mail address:	adam@crunkeng.com .	e-mail address:	mccarley@epochresidential.com .

PROCESS OVERVIEW

A Transportation Impact Analysis shall be prepared by the Applicant's Consultant or the City's Traffic Consultant using the standard format specified by the Institute of Transportation Engineers in accordance with the following:

(i) The applicant shall submit a completed *Request for Transportation Impact Analysis Application Form* to the Engineering Department.

(ii) Scope of Services
   a. Following initial review of the application form, the Engineering Department shall prepare and submit a Scope of Services and schedule to the Applicant. If necessary a meeting will be scheduled to review and discuss the Scope of Services in detail.
   b. Following approval the applicant will pay the City 90% of the estimated cost of the traffic impact study. At the completion of the study the City shall reimburse the applicant all remaining fees.

(iii) Transportation impact analyses shall be prepared utilizing traffic data that are consistent with:
   a. The land use and density data as referenced in the most current edition of Trip Generation, published by the Institute of Transportation Engineers;
   b. Current city and state traffic counts for surrounding streets;
   c. Any additional traffic counts performed as a part of preparing the study.

Attachment A

City of Franklin Review Process for Transportation Impact Analysis

Step 1 – Preliminary discussion with Consultant/Developer on project description including site plan.
Step 2 – Scoping of Transportation Impact Analysis between the City of Franklin and Consultant/Developer.
Step 3 – Consultant, Traffic Engineer and Director of Engineering execute a MOU (Fees may apply per COF Ordinance 2015-64.
Step 4 – Consultant/Developer pays review fee and submits Transportation Impact Analysis.
Step 5 – City of Franklin prepares initial comments on the transportation impact analysis, if necessary.

Step 6 – Consultant submits corrections/revisions to the transportation impact analysis, if necessary.
Step 7 – City of Franklin prepares initial comments on proposed mitigation measures, if necessary
Step 8 – Consultant submits corrections/revisions on proposed mitigation measures, if necessary and electronic copy of the transportation impact analysis.
Step 9 – City of Franklin issues an assessment letter

Attachment B

Transportation Impact Analysis – Memorandum of Understanding (MOU)

This MOU acknowledges that the transportation impact analysis for the following project will be prepared in accordance with the latest version of City of Franklin Zoning Ordinance.

Project Name: Epoch Franklin .
Project Address: Oak Meadow Drive, east of S. Royal Oaks Boulevard .
Project Description: 352 apartments (240 units on north side, 112 apts on the south side) .

Attach a site map and a trip generation table with a description of the proposed land uses, ITE rates, estimated daily, morning, midday and afternoon peak hour volumes (ins/outs/totals), proposed trip credits, etc.

Project Buildout Year: 2018 Ambient or CMP Growth Rate: : 4 % Per Yr.

Study Intersections:

1. Oak Meadow Drive and Private Road for Home Depot / western project access	9. Oak Meadow Drive and the eastern project accesses
2. S. Royal Oaks Blvd and Oak Meadow Dr	10.
3. S. Royal Oaks Blvd and Center Point Pl / Riverside Dr	11.
4. Highway 96E and Royal Oaks Blvd (for data collection and signal timing purposes only)	12.
5. Highway 96E and Ramps for SB I-65(for data collection and signal timing purposes only)	13.
6. Highway 96E and Ramps for NB I-65(for data collection and signal timing purposes only)	14.

Trip Credits: (Exact amount of credit subject to approval by City of Franklin)

	Yes	No
Transit Usage		X
Existing Active Land Use		X
Previous Land Use		X
Internal Trip		X
Pass-By Trip		X

Exhibit B

Consultant:	FTG, LLC	Developer:	Epoch Residential
Address:	PO Box 682736	Address:	359 Carolina Avenue
	Franklin, TN 37068		Winter Park, FL 32789
Phone #:	(615) 771-8022	Phone #:	(321) 316-6005
e-mail address:	Gillian@FTGtraffic.com	e-mail address:	mccarley@epochresidential.com

Approved By: _____ _____

City of Franklin Traffic Engineer Director of Engineering

Reason for Request: (Planned Unit Development, Site Plan, Rezoning)

site plan

Description of Proposed Project (Address, Map/Parcel Number, etc.) (Attach a conceptual development plans showing all access points and adjacent streets.):

079 08800 00009079

079 10105 00109079

Existing Land Use (be specific):

undeveloped

Proposed Land Use (be specific):

240 apartments on 13.06 acres (north) and 112 apartments on 18.87 acres (south)

Potential Development Yield (number of residential units; building square footage, projected number of employees, hours of operations):

352 apartments

As applicant, I agree to pay to the City of Franklin 90% of the entire cost of the Transportation Impact Analysis.

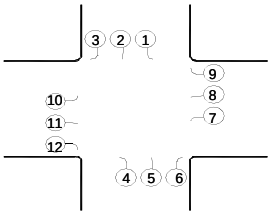
Property Owner Signature: _____

Property Owner Title: _____

Date: _____

The information above shall be submitted to the Engineering Department (109 3rd Ave South; Franklin, TN 37064) to review and provide estimated cost along with a proposed scope of services. All questions should be directed to Carl Baughman, Traffic Engineer III (615-791-3218).

APPENDIX B
EXISTING TRAFFIC COUNTS

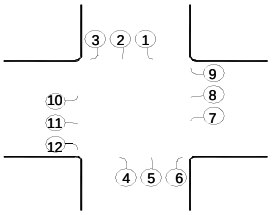


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Oak Meadow Dr and Eastern Home Depot Access
DATE: 23-Feb-16 Tue
RECORDER: FTG
NOTES: unsignalized

LOCATION	S/B Home Depot Access			N/B			W/B Oak Meadow Dr			E/B Oak Meadow Dr				
TIME	1	2	3	4	5	6	7	8	9	10	11	12		
6:30-6:45								24			7		209	31
6:45-7:00								**54**			**13**		**228**	**67**
7:00-7:15								**50**			**13**		209	63
7:15-7:30								**36**			**12**		189	48
7:30-7:45								**43**			**7**		179	50
7:45-8:00								41			7			48
8:00-8:15								33			10			43
8:15-8:30								29			9			38
4:30-4:45								**46**			**33**		**344**	79
4:45-5:00								**33**			**49**		336	82
5:00-5:15								**41**			**48**		346	89
5:15-5:30								**48**			**46**		329	**94**
5:30-5:45								33			38		309	71
5:45-6:00								34			58			92
6:00-6:15								25			47			72
6:15-6:30								32			42			74
TOTAL								**602**			**439**			
AM PK HR								183			45		**6:45-7:45**	
PM PK HR								168			176		**4:30-5:30**	

AM PK PHF								0.85			0.87		**0.85**
PM PK PHF								0.88			0.90		**0.91**

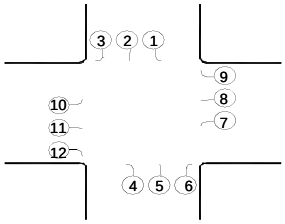


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Oak Meadow Dr and Western Home Depot Access
DATE: 23-Feb-16 Tue
RECORDER: FTG
NOTES: unsignalized

LOCATION	S/B Home Depot Access			N/B			W/B Oak Meadow Dr			E/B Oak Meadow Dr				
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**		
6:30-6:45			1					24			7		213	32
6:45-7:00								**54**			**13**		**231**	**67**
7:00-7:15								**50**		**1**	**13**		213	64
7:15-7:30			**1**					**36**		**1**	**12**		192	50
7:30-7:45	**1**							**43**			**6**		180	50
7:45-8:00								41		1	7			49
8:00-8:15	1							33			9			43
8:15-8:30								29			9			38
4:30-4:45	**3**							**46**		**1**	**30**		**351**	80
4:45-5:00	**4**							**33**		**1**	**45**		343	83
5:00-5:15	**3**		**1**					**40**	**1**	**2**	**45**		354	92
5:15-5:30	**5**		**1**					**47**	**1**	**1**	**41**		335	**96**
5:30-5:45	3							33		1	35		314	72
5:45-6:00	6							34		2	52			94
6:00-6:15	7							25		1	40			73
6:15-6:30	5							32		1	37			75
TOTAL	**38**		**4**					**600**	**2**	**13**	**401**			
AM PK HR	1		1					183		2	44		**6:45-7:45**	
PM PK HR	15		2					166	2	5	161		**4:30-5:30**	

AM PK PHF	0.25		0.25					0.85		0.50	0.85		**0.86**
PM PK PHF	0.75		0.50					0.88	0.50	0.63	0.89		**0.91**

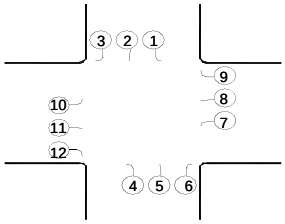


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Oak Meadow Dr
DATE: 4-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Oak Meadow Dr			E/B Oak Meadow Dr			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45	1	96	15	17	231	2	2	2	21	28	4	9	1,978
6:45-7:00	**4**	**88**	**17**	**17**	**270**	**7**	**1**	**4**	**49**	**31**	**2**	**12**	**2,078**
7:00-7:15	**6**	**115**	**15**	**14**	**300**	**6**	**5**	**2**	**43**	**26**	**2**	**16**	2,071
7:15-7:30	**9**	**117**	**15**	**23**	**242**	**4**	**4**		**33**	**34**		**17**	1,995
7:30-7:45	**3**	**157**	**21**	**27**	**225**	**3**	**7**	**8**	**28**	**28**		**21**	1,972
7:45-8:00	5	172	15	17	199	2	8	4	29	30	1	13	
8:00-8:15	3	123	22	22	214	4	8	8	17	29	2	22	
8:15-8:30	6	142	19	18	213	3	7	3	19	24		21	
4:30-4:45	**25**	**187**	**40**	**17**	**169**		**20**	**9**	**17**	**44**	**6**	**26**	**2,272**
4:45-5:00	**29**	**179**	**29**	**18**	**200**	**6**	**17**	**2**	**14**	**25**	**11**	**31**	2,225
5:00-5:15	**32**	**170**	**33**	**28**	**222**	**5**	**19**	**5**	**17**	**35**	**10**	**29**	2,170
5:15-5:30	**32**	**172**	**32**	**22**	**175**	**2**	**21**	**6**	**21**	**32**	**8**	**23**	2,016
5:30-5:45	27	150	29	16	188	4	14	3	16	33	5	28	1,932
5:45-6:00	33	158	33	8	162	11	12	7	15	35	10	22	
6:00-6:15	34	164	16	20	138	3	10	9	6	22	4	25	
6:15-6:30	33	175	18	9	148	1	17	6	9	23	4	19	
TOTAL	**282**	**2,365**	**369**	**293**	**3,296**	**63**	**172**	**78**	**354**	**479**	**69**	**334**	
AM PK HR	22	477	68	81	1,037	20	17	14	153	119	4	66	**6:45-7:45**
PM PK HR	118	708	134	85	766	13	77	22	69	136	35	109	**4:30-5:30**

AM PK PHF	0.61	0.76	0.81	0.75	0.86	0.71	0.61	0.44	0.78	0.88	0.50	0.79	**0.94**
PM PK PHF	0.92	0.95	0.84	0.76	0.86	0.54	0.92	0.61	0.82	0.77	0.80	0.88	**0.94**

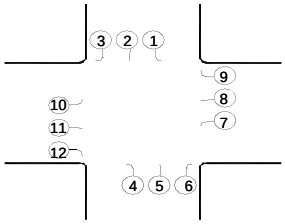


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Rand Place / Home Depot
DATE: 23-Feb-16 Tue
RECORDER: Burns
NOTES: unsignalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Home Depot Access			E/B Rand Place			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:30-6:45	13	93	10	3	279	11	2	1	2	6	1		1,934
6:45-7:00	**10**	**132**	**8**	**2**	**358**	**6**	**2**		**1**	**5**		**1**	**2,048**
7:00-7:15	**15**	**119**	**12**		**364**	**5**	**1**		**1**	**8**	**1**	**1**	2,029
7:15-7:30	**9**	**153**	**9**	**4**	**264**	**5**	**2**		**7**	**4**		**4**	1,968
7:30-7:45	**11**	**182**	**18**	**3**	**295**	**7**	**8**		**2**	**7**		**2**	1,986
7:45-8:00	6	188	6	4	279	9	3		5	2		4	
8:00-8:15	13	172	14	4	240	6	2	1	3	5		6	
8:15-8:30	11	123	11	7	307	7	2		4	7			
4:30-4:45	**5**	**207**	**19**	**1**	**218**	**5**	**11**		**6**	**8**	**1**	**4**	**2,005**
4:45-5:00	**5**	**211**	**27**	**1**	**209**	**3**	**3**		**8**	**6**	**1**	**6**	1,987
5:00-5:15	**5**	**228**	**26**	**2**	**235**	**4**	**4**	**3**	**3**	**5**		**2**	1,967
5:15-5:30	**5**	**237**	**25**	**2**	**234**	**4**	**1**	**1**	**5**	**5**	**1**	**3**	1,888
5:30-5:45	2	262	17	4	156	1	5	1	3	12		4	1,720
5:45-6:00	3	211	23	4	196	2	3	1	4	7		6	
6:00-6:15	3	213	18	2	168	3	5	1	4	12	2	7	
6:15-6:30	1	204	17	2	115	3	2			8		3	
TOTAL	**117**	**2,935**	**260**	**45**	**3,917**	**81**	**56**	**9**	**58**	**107**	**7**	**53**	
AM PK HR	45	586	47	9	1,281	23	13		11	24	1	8	**6:45-7:45**
PM PK HR	20	883	97	6	896	16	19	4	22	24	3	15	**4:30-5:30**

AM PK PHF	0.75	0.80	0.65	0.56	0.88	0.82	0.41		0.39	0.75	0.25	0.50	**0.97**
PM PK PHF	1.00	0.93	0.90	0.75	0.95	0.80	0.43	0.33	0.69	0.75	0.75	0.63	**0.96**

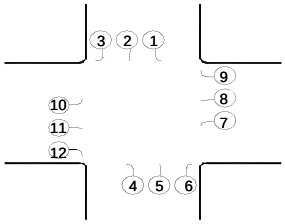


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Center Point Pl and Riverside Dr
DATE: 4-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Riverside Dr			E/B Cener Point Pl			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:30-6:45	50	105	4	3	226	24	6	2	13	0	3	6	2,202
6:45-7:00	45	113	5	2	335	22	5	0	23	2	9	3	2,321
7:00-7:15	**63**	**130**	**4**	**3**	**306**	**22**	**4**	**4**	**26**	**0**	**7**	**10**	**2,378**
7:15-7:30	**59**	**161**	**8**	**7**	**297**	**30**	**10**	**4**	**20**	**0**	**14**	**7**	2,372
7:30-7:45	**63**	**158**	**4**	**8**	**253**	**16**	**12**	**2**	**21**	**3**	**12**	**9**	2,375
7:45-8:00	**62**	**220**	**7**	**8**	**244**	**27**	**5**	**1**	**22**	**3**	**10**	**12**	
8:00-8:15	74	161	8	7	232	19	11	3	33	4	14	7	
8:15-8:30	70	194	6	7	231	25	13	5	31	10	10	18	
4:30-4:45	**56**	**255**	**24**	**19**	**240**	**6**	**11**	**15**	**59**	**21**	**14**	**38**	**2,942**
4:45-5:00	**48**	**243**	**16**	**30**	**228**	**4**	**13**	**14**	**67**	**15**	**15**	**29**	2,865
5:00-5:15	**47**	**233**	**28**	**12**	**247**	**7**	**11**	**20**	**71**	**28**	**13**	**30**	2,829
5:15-5:30	**64**	**233**	**18**	**22**	**240**	**8**	**8**	**5**	**70**	**13**	**17**	**17**	2,730
5:30-5:45	60	223	25	14	221	9	8	8	47	15	29	22	2,571
5:45-6:00	55	206	23	20	228	13	6	7	52	25	22	29	
6:00-6:15	61	200	19	19	199	6	7	10	63	25	14	25	
6:15-6:30	37	184	21	17	166	6	11	10	33	25	17	29	
TOTAL	**914**	**3,019**	**220**	**198**	**3,893**	**244**	**141**	**110**	**651**	**189**	**220**	**291**	
AM PK HR	247	669	23	26	1,100	95	31	11	89	6	43	38	**7:00-8:00**
PM PK HR	215	964	86	83	955	25	43	54	267	77	59	114	**4:30-5:30**

AM PK PHF	0.98	0.76	0.72	0.81	0.90	0.79	0.65	0.69	0.86	0.50	0.77	0.79	**0.96**
PM PK PHF	0.84	0.95	0.77	0.69	0.97	0.78	0.83	0.68	0.94	0.69	0.87	0.75	**0.97**

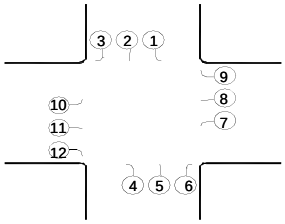


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Murfreesboro Road and Royal Oaks Blvd
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B N. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:30-6:45	21	26	8	14	38	211	99	137	37	4	118	7	3,669
6:45-7:00	29	17	4	24	80	244	123	193	43	15	168	8	4,005
7:00-7:15	48	27	5	28	119	253	107	159	37	20	166	13	4,252
7:15-7:30	51	25	14	22	53	236	160	204	57	21	163	13	4,384
7:30-7:45	**53**	**39**	**18**	**25**	**70**	**213**	**162**	**210**	**58**	**29**	**165**	**14**	**4,492**
7:45-8:00	**50**	**43**	**20**	**26**	**56**	**267**	**210**	**234**	**72**	**25**	**181**	**11**	
8:00-8:15	**53**	**36**	**19**	**14**	**48**	**205**	**193**	**249**	**61**	**23**	**202**	**11**	
8:15-8:30	**52**	**61**	**19**	**27**	**44**	**224**	**191**	**226**	**69**	**27**	**167**	**20**	
4:30-4:45	**71**	**94**	**37**	**28**	**90**	**220**	**195**	**284**	**54**	**45**	**238**	**15**	**5,614**
4:45-5:00	**67**	**103**	**47**	**32**	**78**	**213**	**198**	**252**	**61**	**50**	**275**	**17**	5,552
5:00-5:15	**78**	**90**	**39**	**38**	**74**	**235**	**222**	**272**	**60**	**41**	**267**	**12**	5,358
5:15-5:30	**77**	**107**	**42**	**33**	**73**	**205**	**217**	**279**	**74**	**55**	**246**	**14**	5,160
5:30-5:45	81	101	41	22	74	187	199	271	60	42	211	20	4,965
5:45-6:00	68	78	47	25	72	157	175	208	119	33	197	20	
6:00-6:15	80	89	44	32	65	169	169	234	60	42	229	17	
6:15-6:30	72	87	38	19	54	175	183	260	58	49	219	13	
TOTAL	**951**	**1,023**	**442**	**409**	**1,088**	**3,414**	**2,803**	**3,672**	**980**	**521**	**3,212**	**225**	
AM PK HR	208	179	76	92	218	909	756	919	260	104	715	56	**7:30-8:30**
PM PK HR	293	394	165	131	315	873	832	1,087	249	191	1,026	58	**4:30-5:30**

AM PK PHF	0.98	0.73	0.95	0.85	0.78	0.85	0.90	0.92	0.90	0.90	0.88	0.70	**0.94**
PM PK PHF	0.94	0.92	0.88	0.86	0.88	0.93	0.94	0.96	0.84	0.87	0.93	0.85	**0.98**

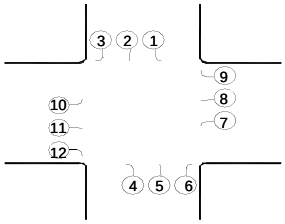


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Murfreesboro Road and the Ramps for Southbound I-65
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B Ramps			N/B			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45	63		148				11				369	34	2,929
6:45-7:00	69		181				31				406	47	3,112
7:00-7:15	66		139				30				471	49	3,159
7:15-7:30	**73**		**196**				**37**				**452**	**57**	**3,168**
7:30-7:45	**61**		**237**				**32**				**432**	**46**	3,140
7:45-8:00	**91**		**245**				**18**				**385**	**42**	
8:00-8:15	**86**		**219**				**29**				**385**	**45**	
8:15-8:30	91		240				24				393	39	
4:30-4:45	**205**		**299**				**71**				**480**	**114**	**4,656**
4:45-5:00	**222**		**322**				**48**				**388**	**95**	4,524
5:00-5:15	**197**		**298**				**76**				**470**	**119**	4,499
5:15-5:30	**222**		**374**				**69**				**469**	**118**	4,376
5:30-5:45	175		319				56				385	102	4,089
5:45-6:00	181		349				44				383	93	
6:00-6:15	196		290				43				408	100	
6:15-6:30	178		256				40				414	77	
TOTAL	**2,176**		**4,112**				**659**				**6,690**	**1,177**	
AM PK HR	311		897				116				1,654	190	**7:15-8:15**
PM PK HR	846		1,293				264				1,807	446	**4:30-5:30**

AM PK PHF	0.85		0.92				0.91				0.96	1.03	**0.97**
PM PK PHF	0.95		0.86				0.87				0.94	0.94	**0.93**



INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Murfreesboro Road and the Ramps for Northbound I-65
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B Ramps			N/B			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45				74		78		144	286	278			3,695
6:45-7:00				**109**		**94**		**150**	**306**	**319**			**3,772**
7:00-7:15				**65**		**66**		**183**	**306**	**331**			3,689
7:15-7:30				**94**		**92**		**154**	**267**	**299**			3,592
7:30-7:45				**107**		**85**		**213**	**248**	**284**			3,508
7:45-8:00				72		101		243	236	243			
8:00-8:15				108		82		182	223	259			
8:15-8:30				91		67		234	223	207			
4:30-4:45				**80**		**40**		**229**	**138**	**215**			**2,712**
4:45-5:00				**75**		**39**		**231**	**134**	**187**			2,597
5:00-5:15				**63**		**39**		**251**	**123**	**208**			2,490
5:15-5:30				**66**		**34**		**213**	**143**	**204**			2,376
5:30-5:45				49		40		200	105	193			2,230
5:45-6:00				79		46		161	101	172			
6:00-6:15				71		44		183	106	166			
6:15-6:30				52		44		176	89	153			
TOTAL				**1,255**		**991**		**1,503**	**3,034**	**3,718**			
AM PK HR				375		337		700	1,127	1,233			**6:45-7:45**
PM PK HR				284		152		814	924	538			**4:30-5:30**

AM PK PHF				0.86		0.90		0.82	0.92	0.93	#DIV/0!		**0.96**
PM PK PHF				0.89		0.95		0.95	0.92	0.94	#DIV/0!		**0.97**

APPENDIX C
CAPACITY ANALYSES

EXISTING CONDITIONS

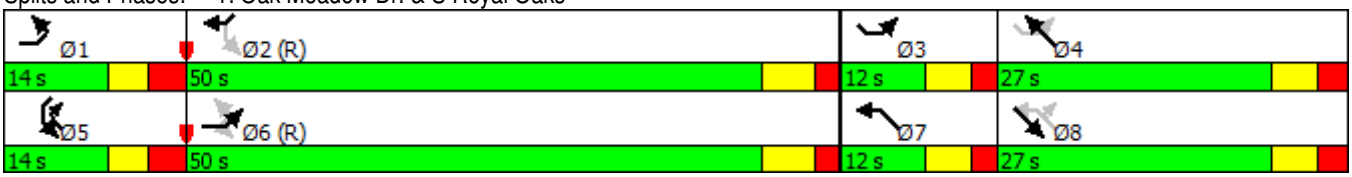
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	81	1037	20	119	4	66	17	14	153	22	477	68
Future Volume (vph)	81	1037	20	119	4	66	17	14	153	22	477	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.861				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1550	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.308	0.950		0.742			0.583			0.208		
Satd. Flow (perm)	497	3319	1531	1336	1550	0	1086	1925	1583	387	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		90				101		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	121	1103	32	151	7	90	23	24	166	29	636	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	1103	32	151	97	0	23	24	166	29	735	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	77.4	66.6	66.6	14.7	10.8		14.7	10.8	21.2	76.9	66.4	
Actuated g/C Ratio	0.75	0.65	0.65	0.14	0.10		0.14	0.10	0.21	0.75	0.64	
v/c Ratio	0.26	0.51	0.03	0.67	0.40		0.11	0.12	0.41	0.07	0.40	
Control Delay	5.3	12.0	0.1	54.1	15.7		34.1	42.2	16.9	4.5	8.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	5.3	12.0	0.1	54.1	15.7		34.1	42.2	16.9	4.5	8.6	
LOS	A	B	A	D	B		C	D	B	A	A	
Approach Delay		11.1			39.0			21.6		8.4		
Approach LOS		B			D			C		A		
90th %ile Green (s)	8.0	54.3	54.3	6.5	11.7		6.5	11.7	7.0	7.0	53.3	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.3	57.4	57.4	6.5	8.6		6.5	8.6	7.0	7.0	57.1	
70th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
50th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
50th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
30th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
30th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	72.0	72.0	6.5	0.0		0.0	0.0	7.0	7.0	72.0	
10th %ile Term Code	Min	Coord	Coord	Max	Skip		Skip	Skip	Min	Min	Coord	
Stops (vph)	21	538	0	110	17		15	14	53	7	205	
Fuel Used(gal)	1	10	0	2	1		0	0	2	0	9	
CO Emissions (g/hr)	39	697	6	172	50		26	24	140	24	628	
NOx Emissions (g/hr)	8	136	1	33	10		5	5	27	5	122	
VOC Emissions (g/hr)	9	162	1	40	12		6	6	32	5	146	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	10	145	0	100	4		14	15	35	2	71	
Queue Length 95th (ft)	32	308	0	120	13		27	25	88	12	130	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	482	2147	1044	224	423		214	439	420	433	1850	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.25	0.51	0.03	0.67	0.23		0.11	0.05	0.40	0.07	0.40	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 59.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	26	1100	95	247	669	23	6	43	38	31	11	89
Future Volume (vph)	26	1100	95	247	669	23	6	43	38	31	11	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.934			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1607	1787	3428	0	1754	1624	0	1787	1523	0
Flt Permitted	0.377			0.182			0.489			0.520		
Satd. Flow (perm)	665	3438	1607	342	3428	0	903	1624	0	978	1523	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82		5			30			103	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	41	1196	109	309	676	34	10	63	49	46	17	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	1196	109	309	710	0	10	112	0	46	120	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

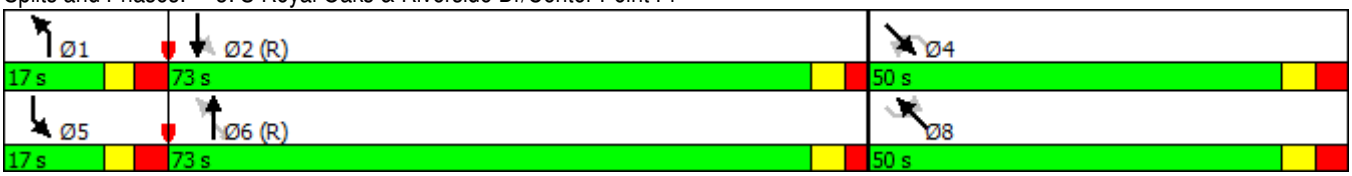
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (%)	12.1%	52.1%	52.1%	12.1%	52.1%		35.7%	35.7%		35.7%	35.7%	
Maximum Green (s)	10.5	67.0	67.0	10.5	67.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	105.1	99.9	99.9	112.9	106.2		15.6	15.6		15.6	15.6	
Actuated g/C Ratio	0.75	0.71	0.71	0.81	0.76		0.11	0.11		0.11	0.11	
v/c Ratio	0.07	0.49	0.09	0.78	0.27		0.10	0.54		0.43	0.46	
Control Delay	3.6	10.1	2.5	37.9	2.9		49.5	43.9		68.5	19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.6	10.1	2.5	37.9	2.9		49.5	43.9		68.5	19.4	
LOS	A	B	A	D	A		D	D		E	B	
Approach Delay		9.2			13.5			44.3			33.0	
Approach LOS		A			B			D			C	
90th %ile Green (s)	7.6	90.9	90.9	10.5	93.8		19.1	19.1		19.1	19.1	
90th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
70th %ile Green (s)	7.0	94.5	94.5	10.5	98.0		15.5	15.5		15.5	15.5	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
50th %ile Green (s)	6.6	96.9	96.9	10.5	100.8		13.1	13.1		13.1	13.1	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
30th %ile Green (s)	6.3	99.4	99.4	10.5	103.6		10.6	10.6		10.6	10.6	
30th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
10th %ile Green (s)	0.0	102.9	102.9	10.5	119.9		7.1	7.1		7.1	7.1	
10th %ile Term Code	Skip	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
Stops (vph)	6	463	9	181	127		7	63		28	22	
Fuel Used(gal)	0	19	1	4	5		0	2		1	1	
CO Emissions (g/hr)	27	1310	91	310	376		10	117		50	64	
NOx Emissions (g/hr)	5	255	18	60	73		2	23		10	12	
VOC Emissions (g/hr)	6	304	21	72	87		2	27		12	15	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	6	228	7	124	63		9	77		40	14	
Queue Length 95th (ft)	11	320	26	m161	m85		18	99		58	24	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	600	2453	1170	394	2601		293	548		317	564	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

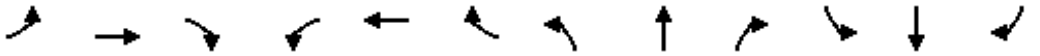
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.07	0.49	0.09	0.78	0.27		0.03	0.20		0.15	0.21	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 64.1%		ICU Level of Service C	
Analysis Period (min) 15			

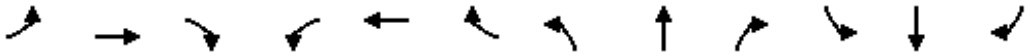
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	715	56	756	919	260	92	218	909	208	179	76
Future Volume (vph)	104	715	56	756	919	260	92	218	909	208	179	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3232	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3232	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				201					36	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	130	794	70	813	1010	295	112	273	977	226	242	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	864	0	813	1010	295	112	273	977	226	336	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

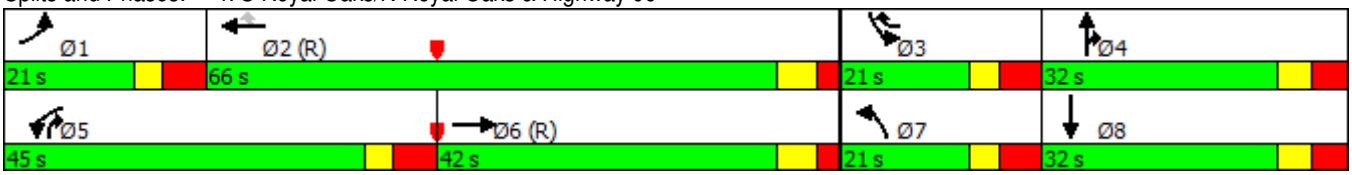


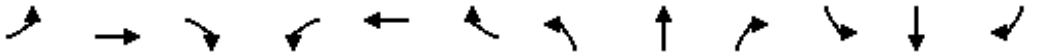
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.2	38.9		39.8	65.4	84.3	12.0	27.5	71.8	14.9	30.3	
Actuated g/C Ratio	0.09	0.28		0.28	0.47	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.40	0.66		0.87	0.63	0.28	0.39	0.38	0.67	0.64	0.46	
Control Delay	77.5	38.6		49.2	40.8	6.0	55.8	51.9	34.8	68.9	45.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	77.5	38.6		49.2	40.8	6.0	55.8	51.9	34.8	68.9	45.0	
LOS	E	D		D	D	A	E	D	C	E	D	
Approach Delay		43.7			39.2			40.0			54.6	
Approach LOS		D			D			D			D	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	12.9	24.5		13.5	25.1	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.0	35.5		37.5	61.0	13.5	11.2	24.5		13.5	26.8	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	10.8	35.5		37.5	62.2	13.5	10.0	24.5		13.5	28.0	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.6	35.9		37.5	63.8	13.1	8.9	24.5		13.1	28.7	
30th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
10th %ile Green (s)	7.8	39.4		36.4	68.0	10.7	7.2	24.5		10.7	28.0	
10th %ile Term Code	Gap	Coord		Gap	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	104	667		657	884	60	85	201	635	196	196	
Fuel Used(gal)	3	16		20	24	3	2	5	16	6	5	
CO Emissions (g/hr)	221	1137		1407	1661	210	146	333	1088	389	373	
NOx Emissions (g/hr)	43	221		274	323	41	28	65	212	76	73	
VOC Emissions (g/hr)	51	264		326	385	49	34	77	252	90	86	
Dilemma Vehicles (#)	0	26		0	34	0	0	0	0	0	0	
Queue Length 50th (ft)	63	260		352	503	50	50	128	322	103	125	
Queue Length 95th (ft)	88	310		m412	m539	m80	73	146	567	148	141	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1308		938	1591	1061	370	714	1473	367	728	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.34	0.66		0.87	0.63	0.28	0.30	0.38	0.66	0.62	0.46	

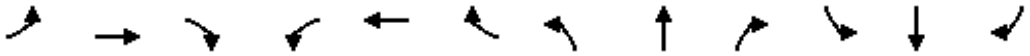
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 42.0		Intersection LOS: D	
Intersection Capacity Utilization 66.7%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1595	172	103	972	0	0	0	0	329	0	941
Future Volume (vph)	0	1595	172	103	972	0	0	0	0	329	0	941
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181									147
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1753	191	120	1117	0	0	0	0	387	0	1001
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1753	191	120	1117	0	0	0	0	387	0	1001
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



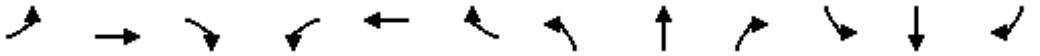
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.9	60.9	15.1	81.0					49.5		49.5
Actuated g/C Ratio		0.44	0.44	0.11	0.58					0.35		0.35
v/c Ratio		0.64	0.25	0.62	0.57					0.33		0.97
Control Delay		23.9	4.3	69.3	18.2					34.2		59.3
Queue Delay		0.1	0.0	0.0	0.3					1.2		0.0
Total Delay		24.0	4.3	69.3	18.5					35.3		59.3
LOS		C	A	E	B					D		E
Approach Delay		22.0			23.5							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		58.2	58.2	14.8	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		60.5	60.5	12.5	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.7	63.7	9.3	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		879	29	103	466					235		753
Fuel Used(gal)		29	2	3	12					6		21
CO Emissions (g/hr)		2048	128	199	828					397		1494
NOx Emissions (g/hr)		398	25	39	161					77		291
VOC Emissions (g/hr)		475	30	46	192					92		346
Dilemma Vehicles (#)		41	0	0	24					0		0
Queue Length 50th (ft)		231	16	116	273					132		451
Queue Length 95th (ft)		330	51	m156	m273					164		#617
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2759	758	229	1960					1162		1033
Starvation Cap Reductn		0	0	0	305					0		0
Spillback Cap Reductn		150	0	0	0					537		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.67	0.25	0.52	0.67					0.62		0.97

Intersection Summary

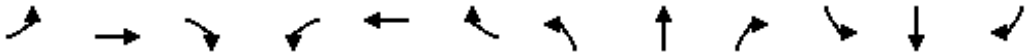
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 31.7		Intersection LOS: C	
Intersection Capacity Utilization 100.3%		ICU Level of Service G	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1233	691	0	0	700	1127	375	0	337	0	0	0
Future Volume (vph)	1233	691	0	0	700	1127	375	0	337	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			289			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1401	803	0	0	737	1150	395	0	366	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1401	803	0	0	737	1150	395	0	366	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.19	0.31			0.55	0.72	1.02		0.82			
Control Delay	144.4	2.7			35.6	24.7	109.7		29.7			
Queue Delay	0.3	0.1			0.0	0.0	0.0		0.0			
Total Delay	144.7	2.8			35.6	24.7	109.7		29.7			
LOS	F	A			D	C	F		C			
Approach Delay		93.0			28.9							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	894	79			533	785	332		80			
Fuel Used(gal)	50	4			12	16	12		4			
CO Emissions (g/hr)	3473	263			824	1101	827		301			
NOx Emissions (g/hr)	676	51			160	214	161		59			
VOC Emissions (g/hr)	805	61			191	255	192		70			
Dilemma Vehicles (#)	0	18			25	0	0		0			
Queue Length 50th (ft)	~756	47			273	409	~195		66			
Queue Length 95th (ft)	#913	71			337	502	#302		#225			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		446			
Starvation Cap Reductn	67	590			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.26	0.40			0.55	0.72	1.02		0.82			

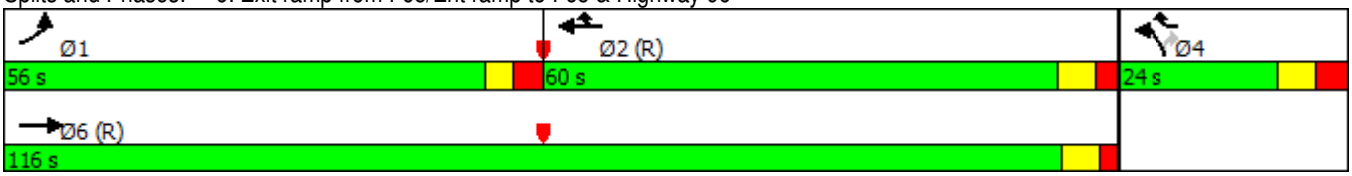
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.19			
Intersection Signal Delay: 64.7		Intersection LOS: E	
Intersection Capacity Utilization 100.3%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	85	766	13	136	35	109	77	22	69	118	708	134
Future Volume (vph)	85	766	13	136	35	109	77	22	69	118	708	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.893				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1608	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.128	0.950		0.732			0.317			0.294		
Satd. Flow (perm)	207	3319	1531	1318	1608	0	590	1925	1583	548	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		101				77		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	127	815	21	172	60	149	103	38	75	157	944	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	815	21	172	209	0	103	38	75	157	1138	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	80.5	67.8	67.8	29.4	17.1		28.2	16.3	30.6	76.9	65.9	
Actuated g/C Ratio	0.67	0.56	0.56	0.24	0.14		0.24	0.14	0.26	0.64	0.55	
v/c Ratio	0.47	0.43	0.02	0.46	0.66		0.42	0.15	0.16	0.35	0.72	
Control Delay	13.5	17.0	0.1	39.6	34.2		38.6	43.7	7.1	9.9	22.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	13.5	17.0	0.1	39.6	34.2		38.6	43.7	7.1	9.9	22.3	
LOS	B	B	A	D	C		D	D	A	A	C	
Approach Delay		16.2			36.6			28.6		20.8		
Approach LOS		B			D			C		C		
90th %ile Green (s)	12.0	57.5	57.5	8.5	22.5		8.5	22.5	8.0	8.0	53.5	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	11.6	62.2	62.2	8.5	17.8		8.5	17.8	8.0	8.0	58.6	
70th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	9.2	65.9	65.9	8.5	14.5		8.5	14.5	7.6	7.6	64.3	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Gap	Gap	Coord	
30th %ile Green (s)	7.0	70.2	70.2	25.3	11.2		8.1	0.0	7.0	7.0	70.2	
30th %ile Term Code	Min	Coord	Coord	Hold	Gap		Gap	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	75.5	75.5	20.0	7.0		7.0	0.0	7.0	7.0	75.5	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Min	Skip	Min	Min	Coord	
Stops (vph)	29	432	0	111	70		58	19	10	44	562	
Fuel Used(gal)	1	8	0	2	2		2	1	1	2	18	
CO Emissions (g/hr)	53	583	4	165	151		116	36	44	138	1229	
NOx Emissions (g/hr)	10	113	1	32	29		23	7	9	27	239	
VOC Emissions (g/hr)	12	135	1	38	35		27	8	10	32	285	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	31	180	0	109	79		63	26	0	38	318	
Queue Length 95th (ft)	47	268	0	137	63		82	35	33	64	356	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	302	1874	921	377	496		248	505	467	460	1590	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.42	0.43	0.02	0.46	0.42		0.42	0.08	0.16	0.34	0.72	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 21.9	Intersection LOS: C
Intersection Capacity Utilization 56.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	83	955	25	215	964	86	77	59	114	43	54	267
Future Volume (vph)	83	955	25	215	964	86	77	59	114	43	54	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.986			0.906			0.877	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1575	1805	3444	0	1736	1672	0	1752	1595	0
Flt Permitted	0.192			0.198			0.147			0.385		
Satd. Flow (perm)	339	3438	1575	376	3444	0	269	1672	0	710	1595	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		12			57			159	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	105	1005	39	287	1071	113	90	83	139	57	61	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	1005	39	287	1184	0	90	222	0	57	345	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	70.0	70.0	30.0	85.0		50.0	50.0		50.0	50.0	
Total Split (s)	14.0	72.0	72.0	29.0	87.0		49.0	49.0		49.0	49.0	
Total Split (%)	9.3%	48.0%	48.0%	19.3%	58.0%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	94.1	88.3	88.3	107.0	96.6		32.0	32.0		32.0	32.0	
Actuated g/C Ratio	0.63	0.59	0.59	0.71	0.64		0.21	0.21		0.21	0.21	
v/c Ratio	0.37	0.50	0.04	0.67	0.53		1.58	0.55		0.38	0.74	
Control Delay	13.2	21.7	0.1	26.3	3.4		363.3	32.8		54.2	37.7	
Queue Delay	0.0	0.0	0.0	0.0	0.3		0.0	0.0		0.0	0.0	
Total Delay	13.2	21.7	0.1	26.3	3.7		363.3	32.8		54.2	37.7	
LOS	B	C	A	C	A		F	C		D	D	
Approach Delay		20.2			8.1			128.1			40.0	
Approach LOS		C			A			F			D	
90th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
70th %ile Green (s)	7.5	73.1	73.1	20.4	86.0		37.0	37.0		37.0	37.0	
70th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
50th %ile Green (s)	7.5	84.8	84.8	15.1	92.4		30.6	30.6		30.6	30.6	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
30th %ile Green (s)	7.5	94.9	94.9	11.6	99.0		24.0	24.0		24.0	24.0	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
10th %ile Green (s)	6.6	107.5	107.5	8.9	109.8		14.1	14.1		14.1	14.1	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
Stops (vph)	34	560	0	149	255		56	115		35	165	
Fuel Used(gal)	1	19	0	3	9		7	3		1	5	
CO Emissions (g/hr)	102	1356	22	231	603		460	215		59	326	
NOx Emissions (g/hr)	20	264	4	45	117		89	42		11	63	
VOC Emissions (g/hr)	24	314	5	54	140		107	50		14	76	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	29	292	0	101	33		~122	118		48	174	
Queue Length 95th (ft)	55	464	0	m91	m161		#214	141		70	255	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	288	2022	977	494	2222		79	536		210	585	
Starvation Cap Reductn	0	0	0	0	423		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.36	0.50	0.04	0.58	0.66		1.14	0.41		0.27	0.59	

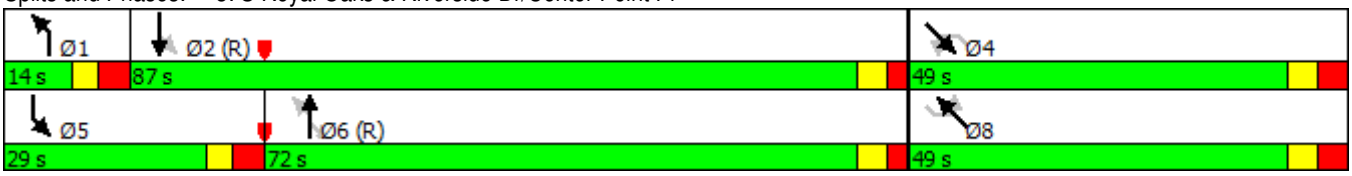
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 123 (82%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.58			
Intersection Signal Delay: 27.4		Intersection LOS: C	
Intersection Capacity Utilization 78.9%		ICU Level of Service D	
Analysis Period (min) 15			

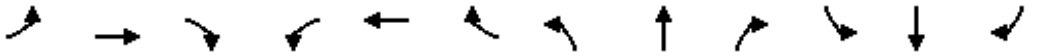
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

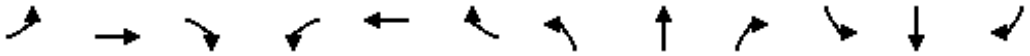
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	1026	58	832	1087	249	131	315	873	293	394	165
Future Volume (vph)	191	1026	58	832	1087	249	131	315	873	293	394	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.950	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3315	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3315	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				106					51	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	208	1103	72	956	1195	280	177	380	981	353	415	206
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	1175	0	956	1195	280	177	380	981	353	621	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

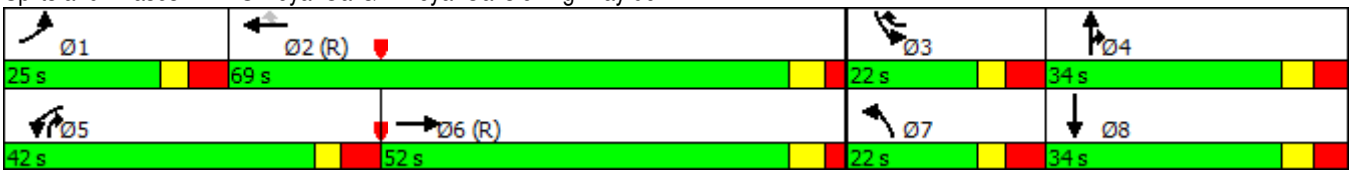


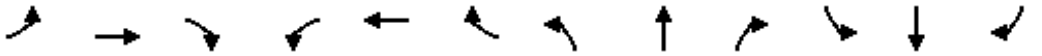
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	16.7	48.0		37.0	68.3	88.8	14.5	29.5	71.0	16.5	31.5	
Actuated g/C Ratio	0.11	0.32		0.25	0.46	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.54	0.74		1.16	0.74	0.27	0.53	0.52	0.72	0.95	0.84	
Control Delay	68.8	41.9		119.7	46.5	14.5	65.6	61.5	39.5	100.9	63.9	
Queue Delay	0.0	0.0		0.0	0.5	0.0	0.1	0.0	0.0	0.0	0.0	
Total Delay	68.8	41.9		119.7	46.9	14.5	65.7	61.5	39.5	100.9	63.9	
LOS	E	D		F	D	B	E	E	D	F	E	
Approach Delay		45.9			71.8			47.9			77.3	
Approach LOS		D			E			D			E	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	15.9	45.5		34.5	64.1	14.5	14.4	26.5		14.5	26.6	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	14.4	45.5		34.5	65.6	14.5	12.9	26.5		14.5	28.1	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	12.8	45.5		34.5	67.2	14.5	11.5	26.5		14.5	29.5	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	10.5	45.5		34.5	69.5	14.5	9.4	26.5		14.5	31.6	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	177	770		714	982	166	124	280	638	266	474	
Fuel Used(gal)	5	22		34	29	4	3	7	16	10	14	
CO Emissions (g/hr)	372	1535		2378	2008	306	227	520	1114	677	985	
NOx Emissions (g/hr)	72	299		463	391	60	44	101	217	132	192	
VOC Emissions (g/hr)	86	356		551	465	71	53	120	258	157	228	
Dilemma Vehicles (#)	0	41		0	37	0	0	0	0	0	0	
Queue Length 50th (ft)	100	266		~580	551	113	85	202	283	179	287	
Queue Length 95th (ft)	m144	336		m#499	m492	m120	m103	m218	m617	#242	#398	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1610	1021	383	730	1369	372	735	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	1		0	114	0	9	0	0	0	1	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.45	0.74		1.16	0.80	0.27	0.47	0.52	0.72	0.95	0.85	

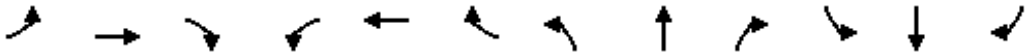
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 61.2		Intersection LOS: E	
Intersection Capacity Utilization 81.9%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1807	446	264	834	0	0	0	0	846	0	1293
Future Volume (vph)	0	1807	446	264	834	0	0	0	0	846	0	1293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			405									177
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	1943	572	372	970	0	0	0	0	972	0	1469
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1943	572	372	970	0	0	0	0	972	0	1469
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.89	0.71	1.25	0.52					0.71		1.24
Control Delay		63.2	26.8	190.8	21.8					41.5		151.8
Queue Delay		0.0	0.0	0.0	0.3					0.2		0.0
Total Delay		63.2	26.8	190.8	22.1					41.8		151.8
LOS		E	C	F	C					D		F
Approach Delay		54.9			68.9							
Approach LOS		D			E							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1693	363	205	393					695		956
Fuel Used(gal)		54	10	13	11					16		53
CO Emissions (g/hr)		3809	671	927	748					1134		3733
NOx Emissions (g/hr)		741	131	180	146					221		726
VOC Emissions (g/hr)		883	156	215	173					263		865
Dilemma Vehicles (#)		108	0	0	34					0		0
Queue Length 50th (ft)		565	221	~464	239					409		~953
Queue Length 95th (ft)		m609	265	#465	337					465		#1065
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	805	297	1865					1368		1180
Starvation Cap Reductn		0	0	0	353					0		0
Spillback Cap Reductn		0	0	0	0					57		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.89	0.71	1.25	0.64					0.74		1.24

Intersection Summary

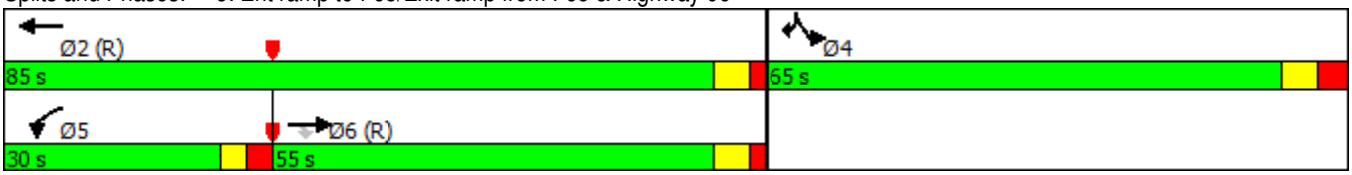
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 78.4		Intersection LOS: E	
Intersection Capacity Utilization 79.1%		ICU Level of Service D	
Analysis Period (min) 15			

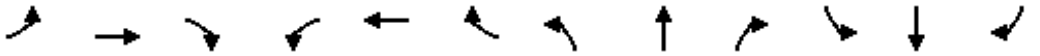
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

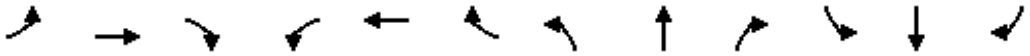
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	538	2115	0	0	814	924	284	0	152	0	0	0
Future Volume (vph)	538	2115	0	0	814	924	284	0	152	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						301			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	555	2158	0	0	895	994	309	0	175	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	555	2158	0	0	895	994	309	0	175	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

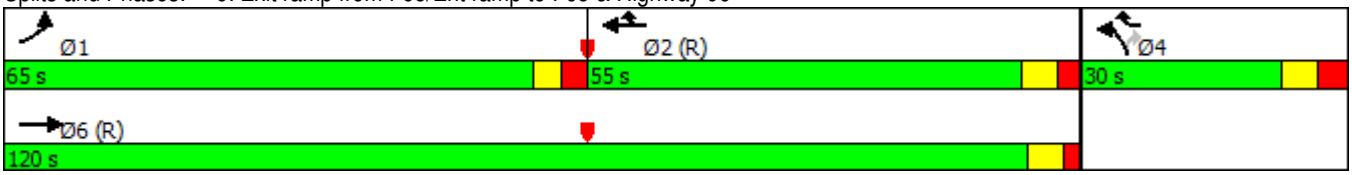


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	33.1	115.2			75.6	106.4	21.3		21.3			
Actuated g/C Ratio	0.22	0.77			0.50	0.71	0.14		0.14			
v/c Ratio	0.77	0.83			0.50	0.48	0.66		0.61			
Control Delay	78.2	19.8			27.0	7.5	68.0		45.7			
Queue Delay	0.0	1.5			0.0	0.0	0.0		0.0			
Total Delay	78.2	21.3			27.0	7.5	68.0		45.7			
LOS	E	C			C	A	E		D			
Approach Delay		33.0			16.8							
Approach LOS		C			B							
90th %ile Green (s)	40.9	114.0			66.6		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	36.1	114.0			71.4		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	33.3	114.0			74.2		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	29.6	114.7			78.6		21.8		21.8			
30th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
10th %ile Green (s)	25.4	119.3			87.4		17.2		17.2			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	537	1521			532	278	266		86			
Fuel Used(gal)	16	31			20	16	7		3			
CO Emissions (g/hr)	1110	2200			1390	1099	462		184			
NOx Emissions (g/hr)	216	428			270	214	90		36			
VOC Emissions (g/hr)	257	510			322	255	107		43			
Dilemma Vehicles (#)	0	77			27	0	0		0			
Queue Length 50th (ft)	297	362			305	150	148		97			
Queue Length 95th (ft)	m341	370			406	234	201		172			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2588			1784	2085	495		298			
Starvation Cap Reductn	0	244			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.43	0.92			0.50	0.48	0.62		0.59			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 29.5		Intersection LOS: C	
Intersection Capacity Utilization 79.1%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



HCS 2010 Two-Way Stop Control Summary Report

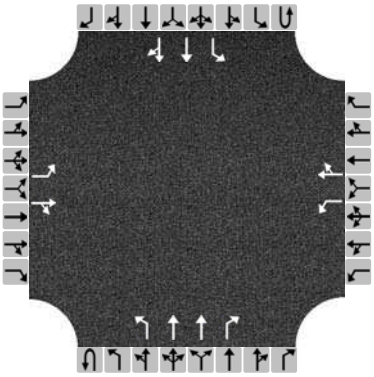
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Existing)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		24	1	8		13	0	11		9	1281	23		45	586	47
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		25		9		13		11		9				46		
Capacity		203		461		130		410		944				519		
v/c Ratio		0.12		0.02		0.10		0.03		0.01				0.09		
95% Queue Length		0.4		0.1		0.3		0.1		0.0				0.3		
Control Delay (s/veh)		25.2		13.0		35.8		14.0		8.8				12.6		
Level of Service (LOS)		D		B		E		B		A				B		
Approach Delay (s/veh)	21.9				25.8				0.1				0.8			
Approach LOS	C				D				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

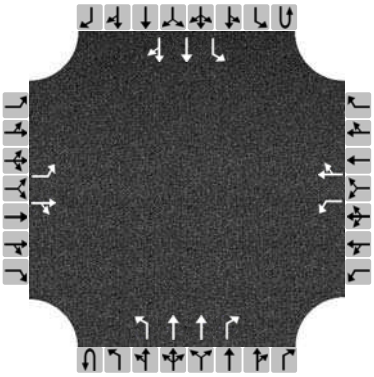
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Existing)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		24	3	15		19	4	22		6	896	16		20	883	97
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		25		19		20		27		6				21		
Capacity		183		391		199		411		688				731		
v/c Ratio		0.14		0.05		0.10		0.07		0.01				0.03		
95% Queue Length		0.5		0.2		0.3		0.2		0.0				0.1		
Control Delay (s/veh)		27.7		14.7		25.1		14.4		10.3				10.1		
Level of Service (LOS)		D		B		D		B		B				B		
Approach Delay (s/veh)	22.1				18.9				0.1				0.2			
Approach LOS	C				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

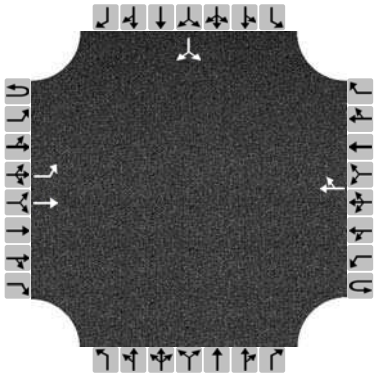
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Existing)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		2	44				183	0						1		1
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		2													2	
Capacity		1351													761	
v/c Ratio		0.00													0.00	
95% Queue Length		0.0													0.0	
Control Delay (s/veh)		7.7													9.7	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.3												9.7			
Approach LOS	A												A			

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HCS 2010 Two-Way Stop Control Summary Report

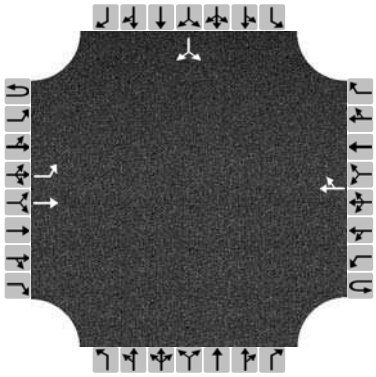
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Existing)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		5	161				166	2						15		2
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		6													21	
Capacity		1373													660	
v/c Ratio		0.00													0.03	
95% Queue Length		0.0													0.1	
Control Delay (s/veh)		7.6													10.6	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.2												10.6			
Approach LOS	A												B			

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BACKGROUND CONDITIONS

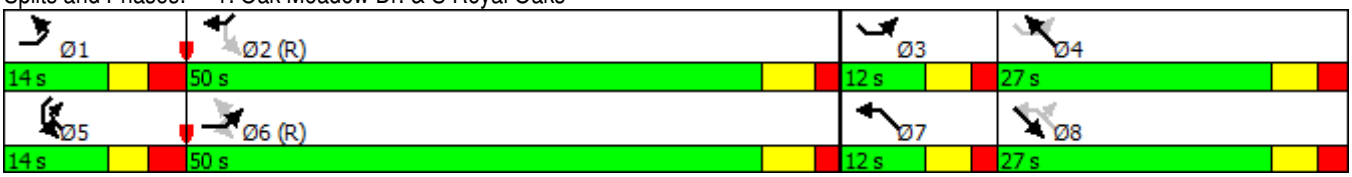
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	29	129	7	71	21	16	170	36	515	73
Future Volume (vph)	87	1120	29	129	7	71	21	16	170	36	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.867				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1561	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.278	0.950		0.739			0.540			0.177		
Satd. Flow (perm)	449	3319	1531	1331	1561	0	1006	1925	1583	330	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		97				90		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	46	163	12	97	28	28	185	48	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1191	46	163	109	0	28	28	185	48	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	74.6	63.7	63.7	17.0	11.1		17.0	11.1	24.1	73.9	63.4	
Actuated g/C Ratio	0.72	0.62	0.62	0.17	0.11		0.17	0.11	0.23	0.72	0.62	
v/c Ratio	0.30	0.58	0.05	0.64	0.43		0.12	0.14	0.42	0.13	0.45	
Control Delay	6.5	14.4	0.1	48.7	16.3		32.2	42.1	19.9	5.6	10.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	6.5	14.4	0.1	48.7	16.3		32.2	42.1	19.9	5.6	10.3	
LOS	A	B	A	D	B		C	D	B	A	B	
Approach Delay		13.2			35.7			23.9		10.0		
Approach LOS		B			D			C		A		
90th %ile Green (s)	8.0	53.7	53.7	6.5	12.3		6.5	12.3	7.0	7.0	52.7	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.6	57.0	57.0	6.5	9.0		6.5	9.0	7.0	7.0	56.4	
70th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
50th %ile Green (s)	7.0	58.5	58.5	6.5	7.5		6.5	7.5	7.0	7.0	58.5	
50th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
30th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
30th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
Stops (vph)	25	656	0	116	19		17	15	74	11	250	
Fuel Used(gal)	1	12	0	3	1		0	0	2	1	10	
CO Emissions (g/hr)	44	821	9	176	57		30	27	173	39	703	
NOx Emissions (g/hr)	9	160	2	34	11		6	5	34	8	137	
VOC Emissions (g/hr)	10	190	2	41	13		7	6	40	9	163	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	23	246	0	93	7		15	17	52	8	125	
Queue Length 95th (ft)	35	351	0	127	15		30	27	110	18	147	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	438	2054	1006	254	431		232	439	453	386	1775	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.30	0.58	0.05	0.64	0.25		0.12	0.06	0.41	0.12	0.45	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	28	1198	103	267	747	25	6	46	41	33	12	96
Future Volume (vph)	28	1198	103	267	747	25	6	46	41	33	12	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.934			0.872	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1607	1787	3428	0	1754	1624	0	1787	1524	0
Flt Permitted	0.341			0.156			0.460			0.497		
Satd. Flow (perm)	602	3438	1607	293	3428	0	849	1624	0	935	1524	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82		5			30			112	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	44	1302	118	334	755	37	10	68	53	49	19	112
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1302	118	334	792	0	10	121	0	49	131	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

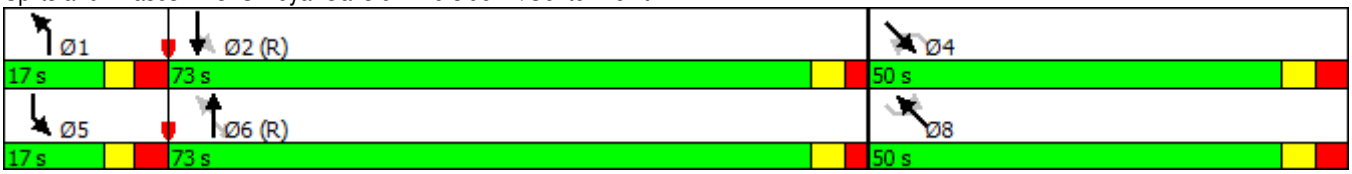
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (%)	12.1%	52.1%	52.1%	12.1%	52.1%		35.7%	35.7%		35.7%	35.7%	
Maximum Green (s)	10.5	67.0	67.0	10.5	67.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	104.4	99.1	99.1	112.1	105.4		16.4	16.4		16.4	16.4	
Actuated g/C Ratio	0.75	0.71	0.71	0.80	0.75		0.12	0.12		0.12	0.12	
v/c Ratio	0.09	0.53	0.10	0.94	0.31		0.10	0.56		0.45	0.47	
Control Delay	3.9	11.1	2.9	57.5	4.9		52.5	47.4		69.1	18.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.9	11.1	2.9	57.5	4.9		52.5	47.4		69.1	18.8	
LOS	A	B	A	E	A		D	D		E	B	
Approach Delay		10.2			20.5			47.8			32.5	
Approach LOS		B			C			D			C	
90th %ile Green (s)	7.7	89.8	89.8	10.5	92.6		20.2	20.2		20.2	20.2	
90th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
70th %ile Green (s)	7.1	93.6	93.6	10.5	97.0		16.4	16.4		16.4	16.4	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
50th %ile Green (s)	6.7	96.1	96.1	10.5	99.9		13.9	13.9		13.9	13.9	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
30th %ile Green (s)	6.3	98.7	98.7	10.5	102.9		11.3	11.3		11.3	11.3	
30th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
10th %ile Green (s)	0.0	102.4	102.4	10.5	119.4		7.6	7.6		7.6	7.6	
10th %ile Term Code	Skip	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
Stops (vph)	7	543	11	209	252		7	68		30	24	
Fuel Used(gal)	0	21	1	6	7		0	2		1	1	
CO Emissions (g/hr)	29	1459	100	414	485		10	130		53	69	
NOx Emissions (g/hr)	6	284	19	81	94		2	25		10	13	
VOC Emissions (g/hr)	7	338	23	96	112		2	30		12	16	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	6	267	9	156	75		9	83		42	16	
Queue Length 95th (ft)	12	374	31	m#192	m228		18	114		60	24	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	553	2434	1161	357	2581		275	548		303	570	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

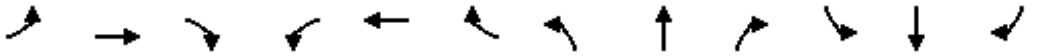
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.08	0.53	0.10	0.94	0.31		0.04	0.22		0.16	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 17.3		Intersection LOS: B	
Intersection Capacity Utilization 68.1%		ICU Level of Service C	
Analysis Period (min) 15			

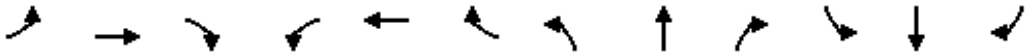
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	831	993	281	99	239	988	225	202	82
Future Volume (vph)	112	772	60	831	993	281	99	239	988	225	202	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3235	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3235	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				173					34	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	894	1091	319	121	299	1062	245	273	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	894	1091	319	121	299	1062	245	374	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

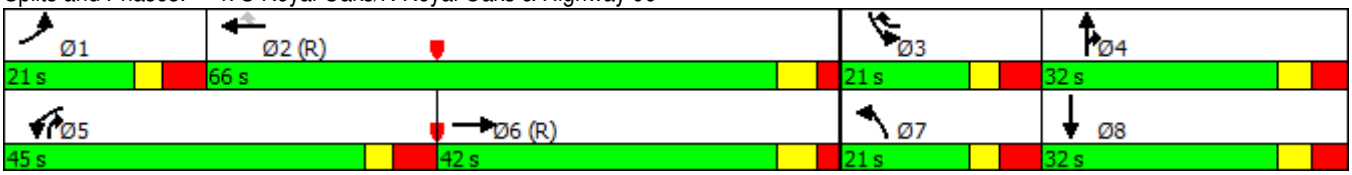


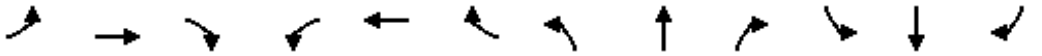
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.5	38.4		40.0	64.9	84.0	12.4	27.5	72.0	15.1	30.2	
Actuated g/C Ratio	0.10	0.27		0.29	0.46	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.43	0.72		0.95	0.69	0.31	0.41	0.42	0.72	0.69	0.52	
Control Delay	76.9	41.3		57.0	40.9	7.8	54.7	49.3	39.6	70.7	47.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	76.9	41.3		57.0	40.9	7.8	54.7	49.3	39.6	70.7	47.1	
LOS	E	D		E	D	A	D	D	D	E	D	
Approach Delay		45.9			42.6			42.8			56.4	
Approach LOS		D			D			D			E	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	13.3	24.5		13.5	24.7	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.4	35.5		37.5	60.6	13.5	11.6	24.5		13.5	26.4	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	11.2	35.5		37.5	61.8	13.5	10.4	24.5		13.5	27.6	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.9	35.5		37.5	63.1	13.5	9.2	24.5		13.5	28.8	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	8.1	37.6		37.5	67.0	11.4	7.5	24.5		11.4	28.4	
10th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	110	737		736	955	86	92	218	750	214	225	
Fuel Used(gal)	3	18		24	26	4	2	5	18	6	6	
CO Emissions (g/hr)	235	1271		1650	1796	249	155	355	1273	427	427	
NOx Emissions (g/hr)	46	247		321	349	48	30	69	248	83	83	
VOC Emissions (g/hr)	55	295		382	416	58	36	82	295	99	99	
Dilemma Vehicles (#)	0	28		0	36	0	0	0	0	0	0	
Queue Length 50th (ft)	69	284		409	535	65	55	140	395	112	144	
Queue Length 95th (ft)	93	338		m435	m554	m109	78	153	655	159	159	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1293		938	1578	1045	370	714	1473	367	724	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.72		0.95	0.69	0.31	0.33	0.42	0.72	0.67	0.52	

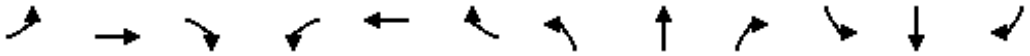
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 44.9		Intersection LOS: D	
Intersection Capacity Utilization 70.5%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1728	187	111	1055	0	0	0	0	355	0	1026
Future Volume (vph)	0	1728	187	111	1055	0	0	0	0	355	0	1026
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182									117
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1899	208	129	1213	0	0	0	0	418	0	1091
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1899	208	129	1213	0	0	0	0	418	0	1091
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.5	60.5	15.5	81.0					49.5		49.5
Actuated g/C Ratio		0.43	0.43	0.11	0.58					0.35		0.35
v/c Ratio		0.69	0.28	0.65	0.62					0.36		1.08
Control Delay		25.9	4.8	71.1	19.1					34.6		89.4
Queue Delay		0.5	0.0	0.0	0.3					2.1		0.0
Total Delay		26.3	4.8	71.1	19.4					36.7		89.4
LOS		C	A	E	B					D		F
Approach Delay		24.2			24.3							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		57.6	57.6	15.4	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		59.8	59.8	13.2	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.2	63.2	9.8	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		1020	34	111	500					256		827
Fuel Used(gal)		33	2	3	13					6		30
CO Emissions (g/hr)		2313	142	218	908					431		2069
NOx Emissions (g/hr)		450	28	42	177					84		403
VOC Emissions (g/hr)		536	33	50	211					100		480
Dilemma Vehicles (#)		50	0	0	33					0		0
Queue Length 50th (ft)		295	20	125	282					144		~586
Queue Length 95th (ft)		388	m50	m163	m294					178		#738
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2743	755	229	1960					1162		1014
Starvation Cap Reductn		0	0	0	217					0		0
Spillback Cap Reductn		376	0	0	0					581		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.80	0.28	0.56	0.70					0.72		1.08

Intersection Summary

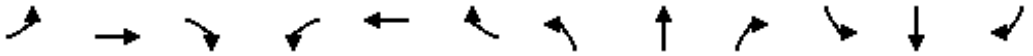
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 39.6	Intersection LOS: D
Intersection Capacity Utilization 107.3%	ICU Level of Service G
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

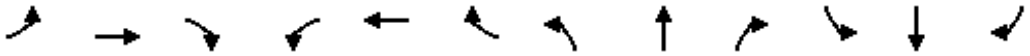
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1336	747	0	0	759	1217	407	0	364	0	0	0
Future Volume (vph)	1336	747	0	0	759	1217	407	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			258			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1518	869	0	0	799	1242	428	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1518	869	0	0	799	1242	428	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.29	0.33			0.59	0.77	1.10		0.95			
Control Delay	186.0	3.2			36.7	27.0	131.0		53.3			
Queue Delay	0.7	0.1			0.0	0.0	0.0		0.0			
Total Delay	186.7	3.3			36.7	27.0	131.0		53.3			
LOS	F	A			D	C	F		D			
Approach Delay		119.9			30.8							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	979	101			591	899	348		115			
Fuel Used(gal)	65	4			13	18	15		7			
CO Emissions (g/hr)	4561	300			914	1264	1018		455			
NOx Emissions (g/hr)	887	58			178	246	198		89			
VOC Emissions (g/hr)	1057	70			212	293	236		105			
Dilemma Vehicles (#)	0	17			27	0	0		0			
Queue Length 50th (ft)	~899	68			303	468	~227		135			
Queue Length 95th (ft)	#1028	76			372	573	#337		#341			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		419			
Starvation Cap Reductn	163	612			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.49	0.44			0.59	0.77	1.10		0.95			

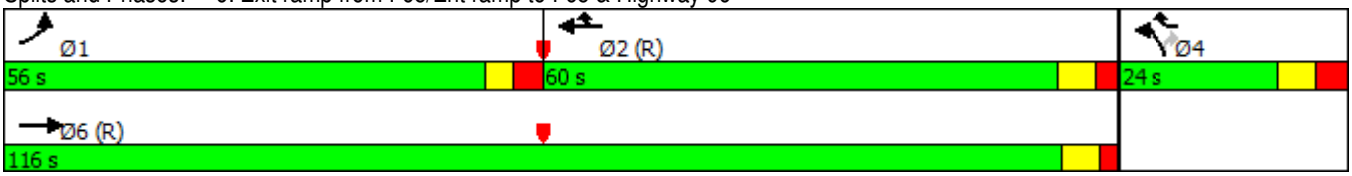
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 81.2		Intersection LOS: F	
Intersection Capacity Utilization 107.3%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	19	147	41	118	92	29	91	138	765	145
Future Volume (vph)	92	827	19	147	41	118	92	29	91	138	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.896				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1613	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.097	0.950		0.724			0.278			0.265		
Satd. Flow (perm)	157	3319	1531	1304	1613	0	518	1925	1583	494	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		93				99		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	30	186	71	162	123	50	99	184	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	880	30	186	233	0	123	50	99	184	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	78.4	65.3	65.3	31.2	19.4		30.6	19.1	33.0	74.3	63.1	
Actuated g/C Ratio	0.65	0.54	0.54	0.26	0.16		0.26	0.16	0.28	0.62	0.53	
v/c Ratio	0.56	0.49	0.03	0.48	0.69		0.51	0.16	0.20	0.45	0.80	
Control Delay	22.4	19.3	0.1	38.4	38.0		39.3	41.7	6.4	12.4	27.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	22.4	19.3	0.1	38.4	38.0		39.3	41.7	6.4	12.4	27.4	
LOS	C	B	A	D	D		D	D	A	B	C	
Approach Delay		19.1			38.2			27.8		25.5		
Approach LOS		B			D			C		C		
90th %ile Green (s)	12.0	54.9	54.9	8.5	25.1		8.5	25.1	8.0	8.0	50.9	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	59.7	59.7	8.5	20.3		8.5	20.3	8.0	8.0	55.7	
70th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	10.3	63.1	63.1	8.5	16.9		8.5	16.9	8.0	8.0	60.8	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
30th %ile Green (s)	7.7	67.2	67.2	8.5	13.5		8.5	13.5	7.3	7.3	66.8	
30th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Gap	Gap	Coord	
10th %ile Green (s)	7.0	73.9	73.9	21.6	8.6		7.0	0.0	7.0	7.0	73.9	
10th %ile Term Code	Min	Coord	Coord	Hold	Gap		Min	Skip	Min	Min	Coord	
Stops (vph)	40	507	0	118	89		69	23	12	56	640	
Fuel Used(gal)	1	10	0	3	3		2	1	1	2	20	
CO Emissions (g/hr)	72	671	6	175	178		139	46	56	168	1408	
NOx Emissions (g/hr)	14	131	1	34	35		27	9	11	33	274	
VOC Emissions (g/hr)	17	156	1	41	41		32	11	13	39	326	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	36	211	0	116	103		74	34	0	49	395	
Queue Length 95th (ft)	56	308	0	142	80		92	41	37	78	423	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	270	1804	892	385	492		248	505	512	418	1528	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.51	0.49	0.03	0.48	0.47		0.50	0.10	0.19	0.44	0.80	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 25.3	Intersection LOS: C
Intersection Capacity Utilization 60.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	90	1063	27	232	1063	93	83	64	123	46	58	288
Future Volume (vph)	90	1063	27	232	1063	93	83	64	123	46	58	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.986			0.906			0.877	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1575	1805	3444	0	1736	1672	0	1752	1595	0
Flt Permitted	0.156			0.144			0.168			0.392		
Satd. Flow (perm)	275	3438	1575	274	3444	0	307	1672	0	723	1595	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		12			57			158	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	114	1119	42	309	1181	122	97	90	150	61	66	306
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1119	42	309	1303	0	97	240	0	61	372	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	70.0	70.0	30.0	85.0		50.0	50.0		50.0	50.0	
Total Split (s)	14.0	72.0	72.0	29.0	87.0		49.0	49.0		49.0	49.0	
Total Split (%)	9.3%	48.0%	48.0%	19.3%	58.0%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	86.2	80.3	80.3	103.3	92.2		36.4	36.4		36.4	36.4	
Actuated g/C Ratio	0.57	0.54	0.54	0.69	0.61		0.24	0.24		0.24	0.24	
v/c Ratio	0.49	0.61	0.05	0.78	0.61		1.31	0.53		0.35	0.73	
Control Delay	18.9	28.2	0.1	40.9	7.1		246.3	34.1		49.9	37.3	
Queue Delay	0.0	0.0	0.0	0.0	1.1		0.0	0.0		0.0	0.0	
Total Delay	18.9	28.2	0.1	40.9	8.2		246.3	34.1		49.9	37.3	
LOS	B	C	A	D	A		F	C		D	D	
Approach Delay		26.4			14.5			95.2			39.1	
Approach LOS		C			B			F			D	
90th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
70th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
70th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
50th %ile Green (s)	7.5	70.5	70.5	22.5	85.5		37.5	37.5		37.5	37.5	
50th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Hold		Hold	Gap	
30th %ile Green (s)	7.5	82.8	82.8	17.8	93.1		29.9	29.9		29.9	29.9	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
10th %ile Green (s)	6.8	101.4	101.4	10.8	105.4		18.3	18.3		18.3	18.3	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
Stops (vph)	41	735	0	224	525		67	124		37	188	
Fuel Used(gal)	2	24	0	5	12		5	3		1	5	
CO Emissions (g/hr)	120	1651	24	322	819		360	236		60	353	
NOx Emissions (g/hr)	23	321	5	63	159		70	46		12	69	
VOC Emissions (g/hr)	28	383	6	75	190		83	55		14	82	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	37	427	0	146	64		~113	157		48	193	
Queue Length 95th (ft)	59	538	0	m112	m351		#217	170		74	289	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	237	1841	900	429	2121		91	536		214	584	
Starvation Cap Reductn	0	0	0	0	527		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.48	0.61	0.05	0.72	0.82		1.07	0.45		0.29	0.64	

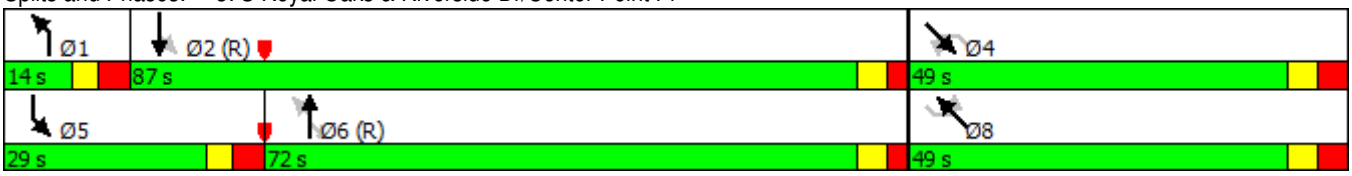
Intersection Summary		
Area Type:	Other	
Cycle Length: 150		
Actuated Cycle Length: 150		
Offset: 123 (82%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.31		
Intersection Signal Delay: 29.0	Intersection LOS: C	
Intersection Capacity Utilization 84.3%	ICU Level of Service E	
Analysis Period (min) 15		

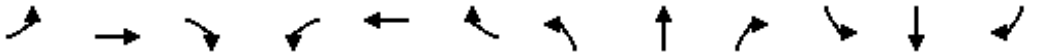
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

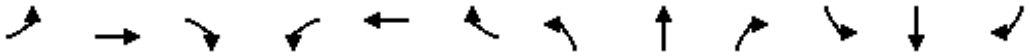
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	913	1174	269	141	351	964	316	434	178
Future Volume (vph)	206	1108	63	913	1174	269	141	351	964	316	434	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.951	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3319	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3319	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					49	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1049	1290	302	191	423	1083	381	457	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1049	1290	302	191	423	1083	381	680	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

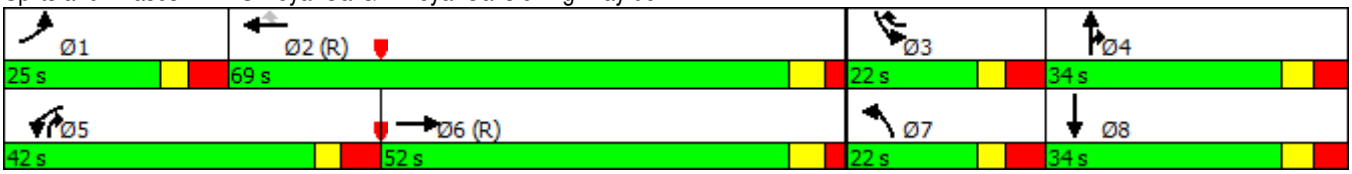


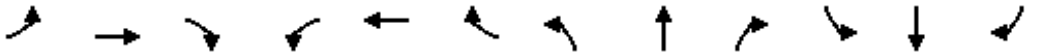
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.27	0.81	0.30	0.55	0.58	0.79	1.02	0.94	
Control Delay	68.7	44.7		163.5	48.8	16.5	60.9	58.9	49.2	117.0	74.6	
Queue Delay	0.0	0.2		0.2	0.6	0.0	0.1	0.0	0.0	0.0	0.3	
Total Delay	68.7	44.9		163.7	49.4	16.5	61.1	58.9	49.2	117.0	74.9	
LOS	E	D		F	D	B	E	E	D	F	E	
Approach Delay		48.5			91.1			53.0			90.0	
Approach LOS		D			F			D			F	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	16.7	45.5		34.5	63.3	14.5	14.5	26.5		14.5	26.5	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)	15.1	45.5		34.5	64.9	14.5	13.5	26.5		14.5	27.5	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	13.4	45.5		34.5	66.6	14.5	12.0	26.5		14.5	29.0	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	11.1	45.5		34.5	68.9	14.5	9.8	26.5		14.5	31.2	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	191	937		743	1069	205	134	321	787	280	514	
Fuel Used(gal)	6	25		45	32	5	3	8	20	11	17	
CO Emissions (g/hr)	401	1777		3150	2214	356	235	570	1395	800	1171	
NOx Emissions (g/hr)	78	346		613	431	69	46	111	271	156	228	
VOC Emissions (g/hr)	93	412		730	513	83	54	132	323	185	271	
Dilemma Vehicles (#)	0	44		0	44	0	0	0	0	0	0	
Queue Length 50th (ft)	107	315		~680	582	137	94	220	490	~203	327	
Queue Length 95th (ft)	155	369		m#521	m521	m130	m109	m236	m692	#272	#465	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	727	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	34		29	84	0	10	0	0	0	2	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.82		1.32	0.85	0.30	0.51	0.58	0.79	1.02	0.94	

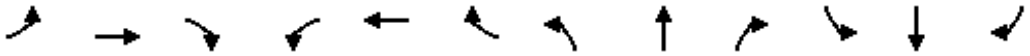
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.27			
Intersection Signal Delay: 72.3		Intersection LOS: E	
Intersection Capacity Utilization 87.4%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1971	484	285	906	0	0	0	0	914	0	1405
Future Volume (vph)	0	1971	484	285	906	0	0	0	0	914	0	1405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			403									143
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2119	621	401	1053	0	0	0	0	1051	0	1597
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2119	621	401	1053	0	0	0	0	1051	0	1597
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.97	0.77	1.35	0.56					0.77		1.38
Control Delay		69.9	30.6	226.6	25.0					43.9		207.9
Queue Delay		0.8	0.0	0.0	0.7					1.7		0.0
Total Delay		70.7	30.6	226.6	25.7					45.6		207.9
LOS		E	C	F	C					D		F
Approach Delay		61.6			81.1							
Approach LOS		E			F							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1855	462	222	472					776		985
Fuel Used(gal)		62	11	16	13					18		74
CO Emissions (g/hr)		4349	802	1147	886					1262		5163
NOx Emissions (g/hr)		846	156	223	172					246		1005
VOC Emissions (g/hr)		1008	186	266	205					292		1197
Dilemma Vehicles (#)		105	0	0	45					0		0
Queue Length 50th (ft)		619	296	~524	272					457		~1127
Queue Length 95th (ft)		m#672	m295	#520	407					515		#1235
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	804	297	1865					1368		1160
Starvation Cap Reductn		0	0	0	446					0		0
Spillback Cap Reductn		14	0	0	0					166		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.98	0.77	1.35	0.74					0.87		1.38

Intersection Summary

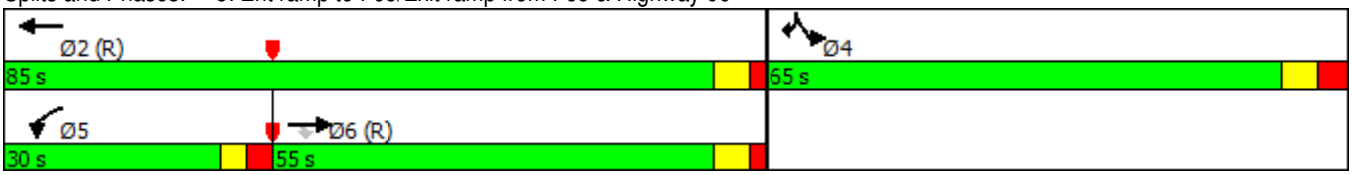
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.38			
Intersection Signal Delay: 97.4		Intersection LOS: F	
Intersection Capacity Utilization 84.7%		ICU Level of Service E	
Analysis Period (min) 15			

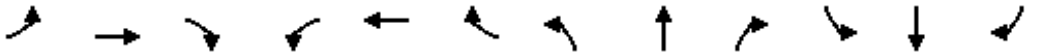
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

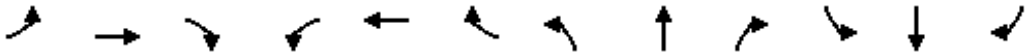
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	595	2290	0	0	882	998	309	0	164	0	0	0
Future Volume (vph)	595	2290	0	0	882	998	309	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						246			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	613	2337	0	0	969	1073	336	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	613	2337	0	0	969	1073	336	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

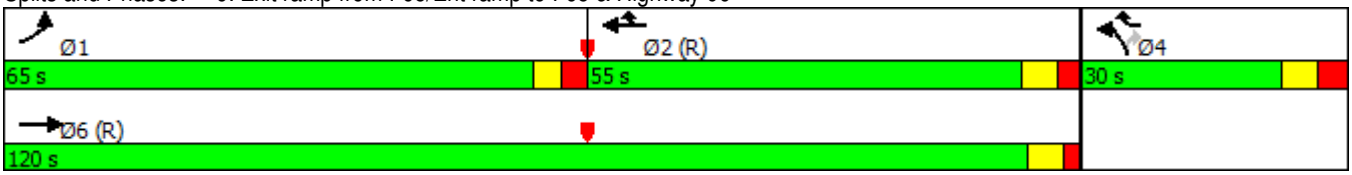


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	35.9	114.7			72.3	103.6	21.8		21.8			
Actuated g/C Ratio	0.24	0.76			0.48	0.69	0.15		0.15			
v/c Ratio	0.78	0.91			0.57	0.54	0.70		0.65			
Control Delay	79.7	23.8			30.4	10.0	69.4		49.0			
Queue Delay	0.0	4.8			0.0	0.0	0.0		0.0			
Total Delay	79.7	28.6			30.4	10.0	69.4		49.0			
LOS	E	C			C	B	E		D			
Approach Delay		39.2			19.7							
Approach LOS		D			B							
90th %ile Green (s)	43.9	114.0			63.6		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	39.0	114.0			68.5		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	36.0	114.0			71.5		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	33.0	114.0			74.5		22.5		22.5			
30th %ile Term Code	Gap	Coord			Coord		Max		Max			
10th %ile Green (s)	27.8	117.5			83.2		19.0		19.0			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	588	1844			621	375	290		100			
Fuel Used(gal)	18	38			23	18	7		3			
CO Emissions (g/hr)	1236	2645			1580	1273	509		208			
NOx Emissions (g/hr)	240	515			307	248	99		40			
VOC Emissions (g/hr)	286	613			366	295	118		48			
Dilemma Vehicles (#)	0	83			29	0	0		0			
Queue Length 50th (ft)	329	582			353	205	162		112			
Queue Length 95th (ft)	m340	m518			467	311	218		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2577			1704	2012	495		298			
Starvation Cap Reductn	0	197			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.48	0.98			0.57	0.53	0.68		0.63			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 34.2		Intersection LOS: C	
Intersection Capacity Utilization 84.7%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



HCS 2010 Two-Way Stop Control Summary Report

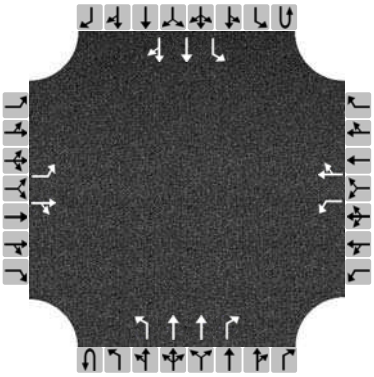
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Background)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	1	9		14	0	17		10	1388	25		61	645	51
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		10		14		18		10				63		
Capacity		165		416		108		377		893				470		
v/c Ratio		0.16		0.02		0.13		0.05		0.01				0.13		
95% Queue Length		0.6		0.1		0.4		0.1		0.0				0.5		
Control Delay (s/veh)		31.0		13.9		43.1		15.0		9.1				13.8		
Level of Service (LOS)		D		B		E		C		A				B		
Approach Delay (s/veh)	26.4				27.3				0.1				1.1			
Approach LOS	D				D				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

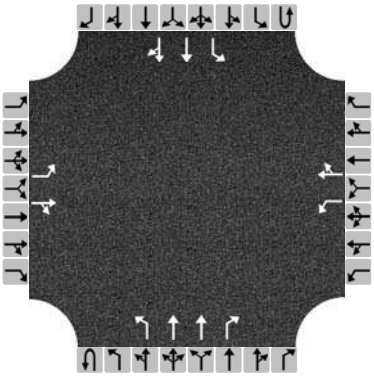
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Background)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	3	16		21	4	40		6	984	17		33	965	105
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		20		22		46		6				34		
Capacity		150		355		170		419		635				675		
v/c Ratio		0.18		0.06		0.13		0.11		0.01				0.05		
95% Queue Length		0.6		0.2		0.4		0.4		0.0				0.2		
Control Delay (s/veh)		34.1		15.7		29.2		14.7		10.7				10.6		
Level of Service (LOS)		D		C		D		B		B				B		
Approach Delay (s/veh)	26.3				19.4				0.1				0.3			
Approach LOS	D				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

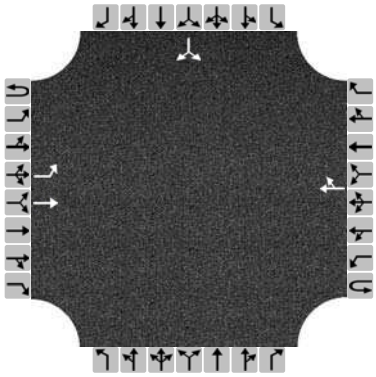
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Background)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		24	48				198	0						1		9
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		30													12	
Capacity		1330													782	
v/c Ratio		0.02													0.02	
95% Queue Length		0.1													0.0	
Control Delay (s/veh)		7.8													9.7	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	2.6												9.7			
Approach LOS	A												A			

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HCS 2010 Two-Way Stop Control Summary Report

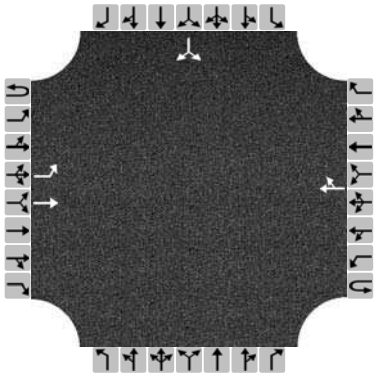
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Background)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		24	174				179	2						16		33
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		30													61	
Capacity		1355													726	
v/c Ratio		0.02													0.08	
95% Queue Length		0.1													0.3	
Control Delay (s/veh)		7.7													10.4	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.9												10.4			
Approach LOS	A												B			

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TOTAL PROJECTED CONDITIONS

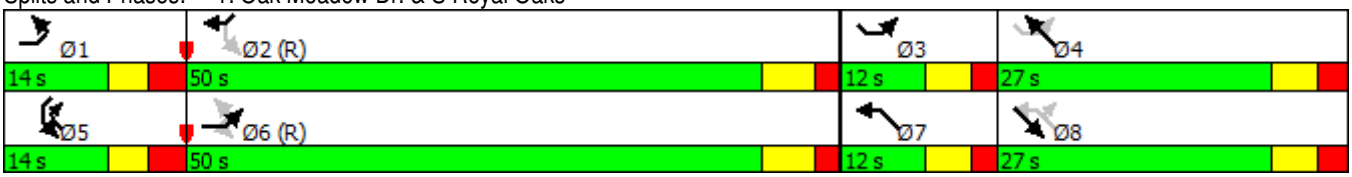
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Future Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.885				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1594	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.271	0.950		0.715			0.495			0.170		
Satd. Flow (perm)	437	3319	1531	1287	1594	0	922	1925	1583	317	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		97				90		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	92	163	29	97	87	64	249	75	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1191	92	163	126	0	87	64	249	75	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	71.0	60.1	60.1	20.0	12.3		20.0	12.3	25.3	70.3	59.8	
Actuated g/C Ratio	0.69	0.58	0.58	0.19	0.12		0.19	0.12	0.25	0.68	0.58	
v/c Ratio	0.32	0.61	0.10	0.57	0.46		0.34	0.28	0.55	0.21	0.47	
Control Delay	7.7	16.8	0.5	41.9	18.6		34.8	43.6	25.6	7.0	11.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.7	16.8	0.5	41.9	18.6		34.8	43.6	25.6	7.0	11.8	
LOS	A	B	A	D	B		C	D	C	A	B	
Approach Delay		14.9			31.7			30.5		11.4		
Approach LOS		B			C			C		B		
90th %ile Green (s)	8.0	52.3	52.3	6.5	13.7		6.5	13.7	7.0	7.0	51.3	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.8	55.3	55.3	6.5	10.7		6.5	10.7	7.0	7.0	54.5	
70th %ile Term Code	Gap	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
50th %ile Green (s)	7.0	56.6	56.6	6.5	9.4		6.5	9.4	7.0	7.0	56.6	
50th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
30th %ile Green (s)	7.0	57.9	57.9	6.5	8.1		6.5	8.1	7.0	7.0	57.9	
30th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
10th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
Stops (vph)	27	714	1	112	27		51	33	126	18	271	
Fuel Used(gal)	1	13	0	2	1		1	1	4	1	10	
CO Emissions (g/hr)	46	880	18	162	68		96	62	270	62	724	
NOx Emissions (g/hr)	9	171	4	32	13		19	12	52	12	141	
VOC Emissions (g/hr)	11	204	4	38	16		22	14	63	14	168	
Dilemma Vehicles (#)	0	0	0	0	0		0	2	0	0	0	
Queue Length 50th (ft)	25	258	0	91	17		46	39	90	14	131	
Queue Length 95th (ft)	37	362	0	124	22		69	48	161	26	152	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	415	1937	957	287	438		253	439	470	367	1681	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.31	0.61	0.10	0.57	0.29		0.34	0.15	0.53	0.20	0.47	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Future Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.934			0.868	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1607	1787	3428	0	1754	1624	0	1787	1520	0
Flt Permitted	0.332			0.138			0.368			0.497		
Satd. Flow (perm)	586	3438	1607	260	3428	0	679	1624	0	935	1520	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82		5			30			137	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	44	1387	118	343	778	37	10	68	53	49	19	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1387	118	343	815	0	10	121	0	49	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (%)	12.1%	52.1%	52.1%	12.1%	52.1%		35.7%	35.7%		35.7%	35.7%	
Maximum Green (s)	10.5	67.0	67.0	10.5	67.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	104.4	99.1	99.1	112.1	105.4		16.4	16.4		16.4	16.4	
Actuated g/C Ratio	0.75	0.71	0.71	0.80	0.75		0.12	0.12		0.12	0.12	
v/c Ratio	0.09	0.57	0.10	1.03	0.32		0.13	0.56		0.45	0.52	
Control Delay	3.9	11.7	2.9	80.0	6.7		55.7	49.1		69.1	18.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.9	11.7	2.9	80.0	6.7		55.7	49.1		69.1	18.2	
LOS	A	B	A	F	A		E	D		E	B	
Approach Delay		10.8			28.4			49.6			30.4	
Approach LOS		B			C			D			C	
90th %ile Green (s)	7.7	89.8	89.8	10.5	92.6		20.2	20.2		20.2	20.2	
90th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
70th %ile Green (s)	7.1	93.6	93.6	10.5	97.0		16.4	16.4		16.4	16.4	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
50th %ile Green (s)	6.7	96.1	96.1	10.5	99.9		13.9	13.9		13.9	13.9	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
30th %ile Green (s)	6.3	98.7	98.7	10.5	102.9		11.3	11.3		11.3	11.3	
30th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
10th %ile Green (s)	0.0	102.4	102.4	10.5	119.4		7.6	7.6		7.6	7.6	
10th %ile Term Code	Skip	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
Stops (vph)	7	603	11	227	286		7	68		30	26	
Fuel Used(gal)	0	23	1	7	8		0	2		1	1	
CO Emissions (g/hr)	29	1574	100	518	529		11	132		53	80	
NOx Emissions (g/hr)	6	306	19	101	103		2	26		10	16	
VOC Emissions (g/hr)	7	365	23	120	123		2	31		12	19	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	6	296	9	~180	83		9	82		42	16	
Queue Length 95th (ft)	12	414	31	m#181	m343		18	114		60	21	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	542	2434	1161	333	2581		220	548		303	586	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.08	0.57	0.10	1.03	0.32		0.05	0.22		0.16	0.27	

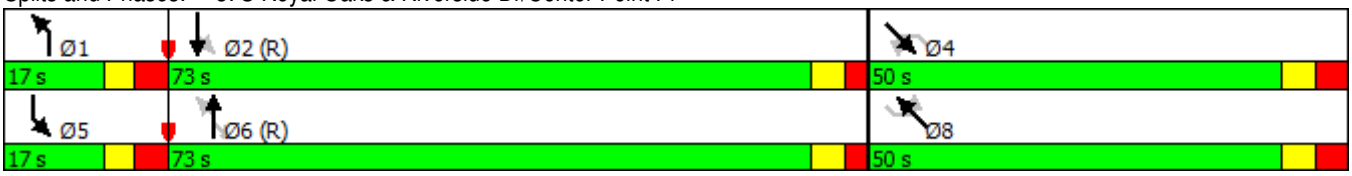
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 20.5		Intersection LOS: C	
Intersection Capacity Utilization 70.6%		ICU Level of Service C	
Analysis Period (min) 15			

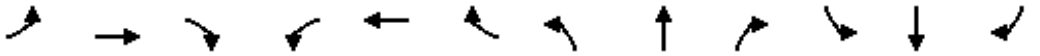
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

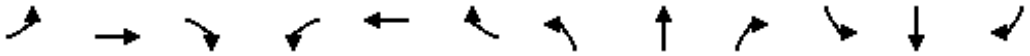
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Future Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				149					31	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	914	1091	319	121	340	1134	245	288	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	914	1091	319	121	340	1134	245	389	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

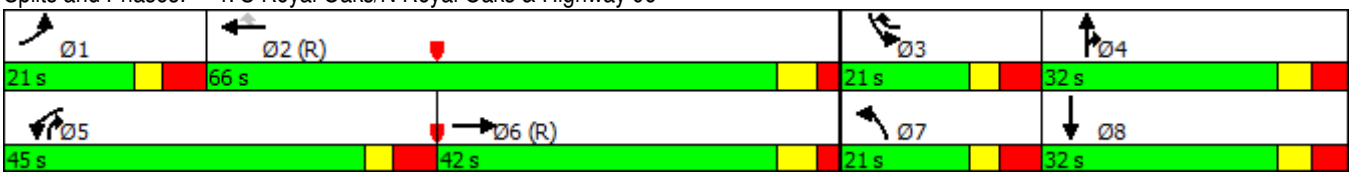


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.5	38.4		40.0	64.9	84.0	12.4	27.5	72.0	15.1	30.2	
Actuated g/C Ratio	0.10	0.27		0.29	0.46	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.43	0.72		0.97	0.69	0.31	0.41	0.48	0.77	0.69	0.54	
Control Delay	76.9	41.3		61.0	40.4	8.7	54.2	48.5	43.0	70.7	48.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	76.9	41.3		61.0	40.4	8.7	54.2	48.5	43.0	70.7	48.2	
LOS	E	D		E	D	A	D	D	D	E	D	
Approach Delay		45.9			44.1			45.0			56.9	
Approach LOS		D			D			D			E	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	13.3	24.5		13.5	24.7	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.4	35.5		37.5	60.6	13.5	11.6	24.5		13.5	26.4	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	11.2	35.5		37.5	61.8	13.5	10.4	24.5		13.5	27.6	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.9	35.5		37.5	63.1	13.5	9.2	24.5		13.5	28.8	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	8.1	37.6		37.5	67.0	11.4	7.5	24.5		11.4	28.4	
10th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	110	736		759	947	98	92	248	849	214	238	
Fuel Used(gal)	3	18		25	25	4	2	6	20	6	6	
CO Emissions (g/hr)	235	1270		1740	1782	261	155	401	1428	427	449	
NOx Emissions (g/hr)	46	247		338	347	51	30	78	278	83	87	
VOC Emissions (g/hr)	55	294		403	413	60	36	93	331	99	104	
Dilemma Vehicles (#)	0	28		0	36	0	0	0	0	0	0	
Queue Length 50th (ft)	69	284		419	535	78	54	156	475	112	153	
Queue Length 95th (ft)	93	338		m#446	m544	m122	76	174	696	159	167	
Internal Link Dist (ft)		620			611			712			884	

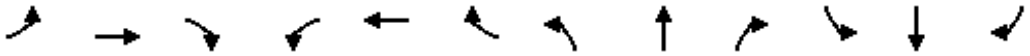
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1293		938	1578	1035	370	714	1473	367	723	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.72		0.97	0.69	0.31	0.33	0.48	0.77	0.67	0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 46.1		Intersection LOS: D	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Future Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			184									115
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.5	60.5	15.5	81.0					49.5		49.5
Actuated g/C Ratio		0.43	0.43	0.11	0.58					0.35		0.35
v/c Ratio		0.72	0.29	0.65	0.62					0.36		1.09
Control Delay		26.6	4.9	71.8	19.3					34.6		94.9
Queue Delay		0.8	0.0	0.0	0.3					2.1		0.0
Total Delay		27.3	4.9	71.8	19.5					36.7		94.9
LOS		C	A	E	B					D		F
Approach Delay		25.1			24.5							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		57.6	57.6	15.4	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		59.8	59.8	13.2	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.2	63.2	9.8	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		1114	37	111	497					256		836
Fuel Used(gal)		35	2	3	13					6		31
CO Emissions (g/hr)		2450	150	219	912					431		2177
NOx Emissions (g/hr)		477	29	43	177					84		423
VOC Emissions (g/hr)		568	35	51	211					100		504
Dilemma Vehicles (#)		50	0	0	34					0		0
Queue Length 50th (ft)		324	26	124	283					144		~602
Queue Length 95th (ft)		406	m47	m164	m297					178		#754
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2743	756	229	1960					1162		1012
Starvation Cap Reductn		0	0	0	215					0		0
Spillback Cap Reductn		420	0	0	0					581		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.85	0.29	0.56	0.70					0.72		1.09

Intersection Summary

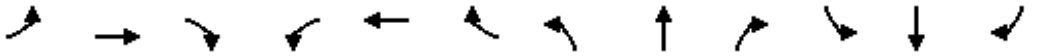
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 41.2		Intersection LOS: D	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

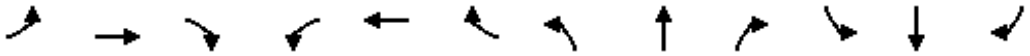
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Future Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			252			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.33	0.34			0.59	0.77	1.10		0.96			
Control Delay	204.9	3.4			36.8	27.0	131.8		56.6			
Queue Delay	0.7	0.1			0.0	0.0	0.0		0.0			
Total Delay	205.5	3.5			36.8	27.0	131.8		56.6			
LOS	F	A			D	C	F		E			
Approach Delay		132.8			30.8							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	1007	107			597	899	350		119			
Fuel Used(gal)	73	4			13	18	15		7			
CO Emissions (g/hr)	5085	310			923	1264	1025		474			
NOx Emissions (g/hr)	989	60			180	246	200		92			
VOC Emissions (g/hr)	1179	72			214	293	238		110			
Dilemma Vehicles (#)	0	18			27	0	0		0			
Queue Length 50th (ft)	~952	67			306	468	~228		142			
Queue Length 95th (ft)	#1078	75			375	573	#338		#351			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		414			
Starvation Cap Reductn	163	623			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.55	0.45			0.59	0.77	1.10		0.96			

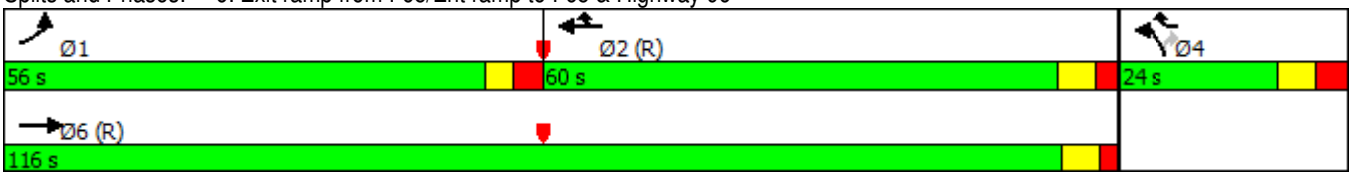
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.33			
Intersection Signal Delay: 87.9		Intersection LOS: F	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Future Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.906				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1631	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.083	0.950		0.704			0.285			0.252		
Satd. Flow (perm)	134	3319	1531	1268	1631	0	531	1925	1583	469	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		68				132		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	71	186	97	162	152	66	132	255	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	880	71	186	259	0	152	66	132	255	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	74.5	61.4	61.4	34.8	22.9		34.2	21.9	36.8	70.9	59.5	
Actuated g/C Ratio	0.62	0.51	0.51	0.29	0.19		0.28	0.18	0.31	0.59	0.50	
v/c Ratio	0.61	0.52	0.08	0.44	0.71		0.58	0.19	0.23	0.65	0.85	
Control Delay	29.2	22.0	0.2	34.6	43.2		39.1	39.7	5.3	20.8	31.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	29.2	22.0	0.2	34.6	43.2		39.1	39.7	5.3	20.8	31.8	
LOS	C	C	A	C	D		D	D	A	C	C	
Approach Delay		21.5			39.6			26.5		29.9		
Approach LOS		C			D			C		C		
90th %ile Green (s)	12.0	51.3	51.3	8.5	28.7		8.5	28.7	8.0	8.0	47.3	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	56.1	56.1	8.5	23.9		8.5	23.9	8.0	8.0	52.1	
70th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	10.3	59.6	59.6	8.5	20.4		8.5	20.4	8.0	8.0	57.3	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
30th %ile Green (s)	7.7	63.0	63.0	8.5	17.0		8.5	17.0	8.0	8.0	63.3	
30th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
10th %ile Green (s)	7.0	69.4	69.4	25.5	11.9		7.6	0.0	7.6	7.6	70.0	
10th %ile Term Code	Min	Coord	Coord	Hold	Gap		Gap	Skip	Gap	Gap	Coord	
Stops (vph)	47	542	0	112	120		84	31	14	89	658	
Fuel Used(gal)	1	10	0	2	3		2	1	1	4	21	
CO Emissions (g/hr)	84	717	14	165	215		171	59	71	260	1472	
NOx Emissions (g/hr)	16	139	3	32	42		33	12	14	51	286	
VOC Emissions (g/hr)	19	166	3	38	50		40	14	17	60	341	
Dilemma Vehicles (#)	0	0	0	0	0		0	2	0	0	0	
Queue Length 50th (ft)	42	226	0	111	140		88	43	0	78	422	
Queue Length 95th (ft)	70	328	0	135	108		105	49	40	116	447	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	254	1697	847	421	478		265	505	578	391	1448	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.54	0.52	0.08	0.44	0.54		0.57	0.13	0.23	0.65	0.85	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 64.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Future Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.987			0.906			0.876	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1575	1805	3447	0	1736	1672	0	1752	1593	0
Flt Permitted	0.138			0.121			0.168			0.405		
Satd. Flow (perm)	243	3438	1575	230	3447	0	307	1672	0	747	1593	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		11			57			165	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	114	1161	42	351	1251	122	97	90	150	61	66	319
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1161	42	351	1373	0	97	240	0	61	385	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	70.0	70.0	30.0	85.0		50.0	50.0		50.0	50.0	
Total Split (s)	14.0	72.0	72.0	29.0	87.0		49.0	49.0		49.0	49.0	
Total Split (%)	9.3%	48.0%	48.0%	19.3%	58.0%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	82.2	76.3	76.3	102.1	90.7		37.9	37.9		37.9	37.9	
Actuated g/C Ratio	0.55	0.51	0.51	0.68	0.60		0.25	0.25		0.25	0.25	
v/c Ratio	0.54	0.66	0.05	0.89	0.66		1.26	0.52		0.32	0.73	
Control Delay	22.5	31.3	0.1	50.6	9.5		225.4	33.3		48.0	36.4	
Queue Delay	0.0	0.0	0.0	0.0	2.5		0.0	0.0		0.0	0.0	
Total Delay	22.5	31.3	0.1	50.6	11.9		225.4	33.3		48.0	36.4	
LOS	C	C	A	D	B		F	C		D	D	
Approach Delay		29.5			19.8			88.6			38.0	
Approach LOS		C			B			F			D	
90th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
70th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
70th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
50th %ile Green (s)	7.5	67.5	67.5	22.5	82.5		40.5	40.5		40.5	40.5	
50th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Hold		Hold	Gap	
30th %ile Green (s)	7.5	75.6	75.6	22.5	90.6		32.4	32.4		32.4	32.4	
30th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Hold		Hold	Gap	
10th %ile Green (s)	6.9	91.3	91.3	19.2	103.6		20.0	20.0		20.0	20.0	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
Stops (vph)	43	813	0	282	618		68	125		35	193	
Fuel Used(gal)	2	25	0	6	13		5	3		1	5	
CO Emissions (g/hr)	125	1781	24	412	929		336	234		58	360	
NOx Emissions (g/hr)	24	347	5	80	181		65	46		11	70	
VOC Emissions (g/hr)	29	413	6	95	215		78	54		13	84	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	40	471	0	205	162		~107	158		47	194	
Queue Length 95th (ft)	59	567	0	m133	m599		#217	176		74	300	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	214	1748	861	403	2089		91	536		221	588	
Starvation Cap Reductn	0	0	0	0	562		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.53	0.66	0.05	0.87	0.90		1.07	0.45		0.28	0.65	

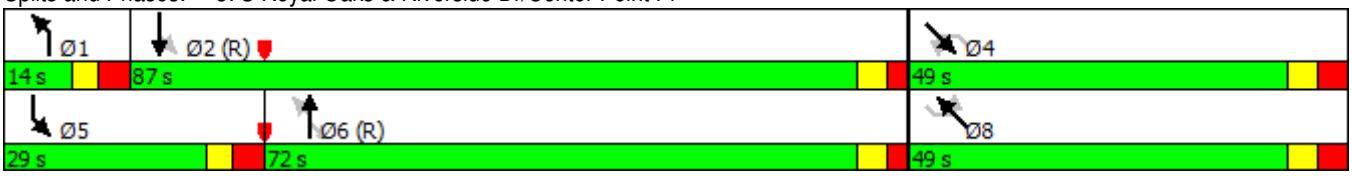
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 123 (82%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.26			
Intersection Signal Delay: 31.3		Intersection LOS: C	
Intersection Capacity Utilization 87.9%		ICU Level of Service E	
Analysis Period (min) 15			

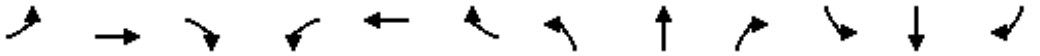
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

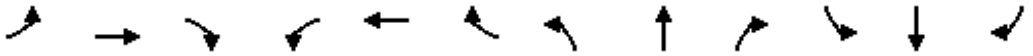
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Future Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					44	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1122	1290	302	191	443	1122	381	489	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1122	1290	302	191	443	1122	381	712	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

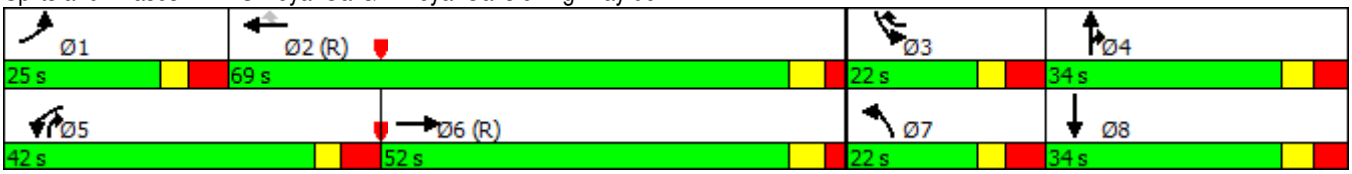


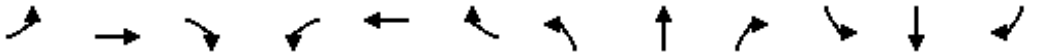
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.36	0.81	0.30	0.55	0.61	0.82	1.02	0.98	
Control Delay	68.7	44.7		200.8	49.2	16.6	58.5	59.9	52.2	117.0	84.1	
Queue Delay	0.0	0.3		0.3	0.6	0.0	0.1	0.0	0.1	0.0	0.5	
Total Delay	68.7	45.0		201.1	49.8	16.6	58.6	59.9	52.3	117.0	84.6	
LOS	E	D		F	D	B	E	E	D	F	F	
Approach Delay		48.6			108.6			54.9			95.9	
Approach LOS		D			F			D			F	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	16.7	45.5		34.5	63.3	14.5	14.5	26.5		14.5	26.5	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)	15.1	45.5		34.5	64.9	14.5	13.5	26.5		14.5	27.5	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	13.4	45.5		34.5	66.6	14.5	12.0	26.5		14.5	29.0	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	11.1	45.5		34.5	68.9	14.5	9.8	26.5		14.5	31.2	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	191	938		759	1064	208	133	346	815	280	539	
Fuel Used(gal)	6	25		55	32	5	3	9	21	11	19	
CO Emissions (g/hr)	401	1778		3861	2216	359	230	606	1488	800	1315	
NOx Emissions (g/hr)	78	346		751	431	70	45	118	289	156	256	
VOC Emissions (g/hr)	93	412		895	514	83	53	140	345	185	305	
Dilemma Vehicles (#)	0	44		0	45	0	0	0	0	0	0	
Queue Length 50th (ft)	107	316		~759	580	139	94	228	581	~203	~352	
Queue Length 95th (ft)	155	368		m#567	m517	m125	m105	m249	m716	#272	#505	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	725	
Starvation Cap Reductn	0	0		0	0	0	0	0	11	0	0	
Spillback Cap Reductn	0	48		46	84	0	10	0	0	0	2	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.83		1.44	0.85	0.30	0.51	0.61	0.83	1.02	0.98	

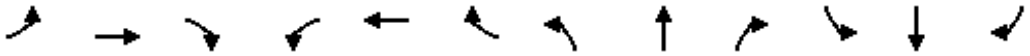
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.36			
Intersection Signal Delay: 80.6		Intersection LOS: F	
Intersection Capacity Utilization 90.0%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Future Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			400									135
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.99	0.78	1.35	0.58					0.77		1.43
Control Delay		71.6	30.4	226.4	26.5					43.9		229.0
Queue Delay		1.3	0.0	0.0	0.9					1.8		0.0
Total Delay		72.9	30.4	226.4	27.4					45.7		229.0
LOS		E	C	F	C					D		F
Approach Delay		63.3			81.4							
Approach LOS		E			F							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1873	465	222	498					776		998
Fuel Used(gal)		64	12	16	13					18		82
CO Emissions (g/hr)		4459	807	1146	935					1262		5755
NOx Emissions (g/hr)		868	157	223	182					246		1120
VOC Emissions (g/hr)		1033	187	266	217					292		1334
Dilemma Vehicles (#)		105	0	0	51					0		0
Queue Length 50th (ft)		634	325	~525	287					457		~1192
Queue Length 95th (ft)		m#692	m295	#521	430					515		#1297
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	802	297	1865					1368		1155
Starvation Cap Reductn		0	0	0	464					0		0
Spillback Cap Reductn		14	0	0	0					172		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.99	0.78	1.35	0.77					0.88		1.43

Intersection Summary

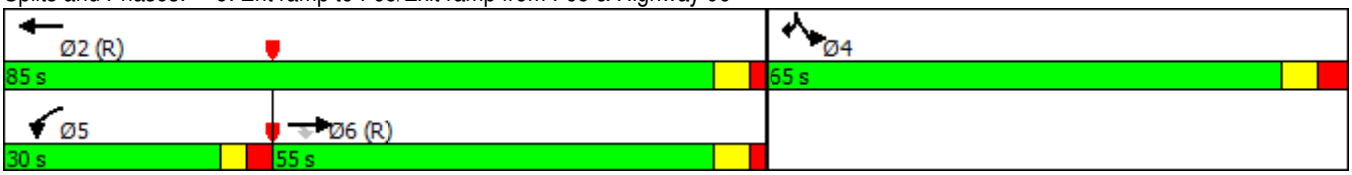
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 103.7		Intersection LOS: F	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			

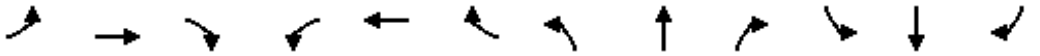
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

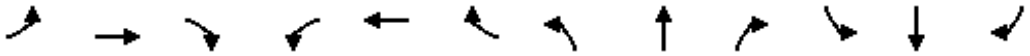
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Future Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						226			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

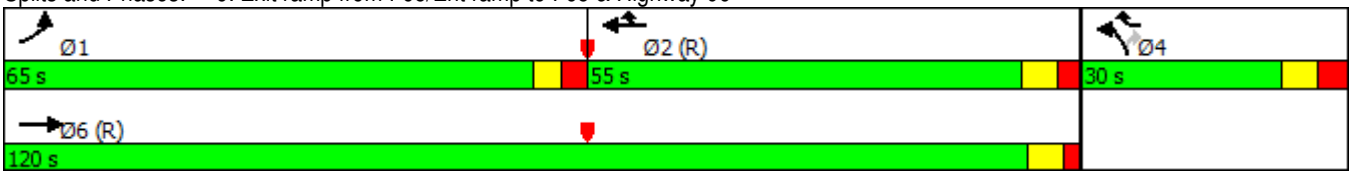


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	37.2	114.6			70.9	102.3	21.9		21.9			
Actuated g/C Ratio	0.25	0.76			0.47	0.68	0.15		0.15			
v/c Ratio	0.79	0.91			0.59	0.54	0.71		0.65			
Control Delay	79.7	23.9			31.8	10.9	69.9		48.9			
Queue Delay	0.0	5.4			0.0	0.0	0.0		0.0			
Total Delay	79.7	29.3			31.8	10.9	69.9		48.9			
LOS	E	C			C	B	E		D			
Approach Delay		40.1			20.9							
Approach LOS		D			C							
90th %ile Green (s)	45.2	114.0			62.3		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	40.9	114.0			66.6		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	37.2	114.0			70.3		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	34.1	114.0			73.4		22.5		22.5			
30th %ile Term Code	Gap	Coord			Coord		Max		Max			
10th %ile Green (s)	28.8	117.2			81.9		19.3		19.3			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	610	1847			646	395	295		100			
Fuel Used(gal)	18	38			23	19	7		3			
CO Emissions (g/hr)	1284	2656			1632	1299	521		208			
NOx Emissions (g/hr)	250	517			317	253	101		40			
VOC Emissions (g/hr)	298	615			378	301	121		48			
Dilemma Vehicles (#)	0	83			30	0	0		0			
Queue Length 50th (ft)	342	589			366	218	165		112			
Queue Length 95th (ft)	m344	m499			485	327	222		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2575			1672	1982	495		298			
Starvation Cap Reductn	0	199			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.50	0.99			0.59	0.54	0.69		0.63			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 35.1		Intersection LOS: D	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



HCS 2010 Two-Way Stop Control Summary Report

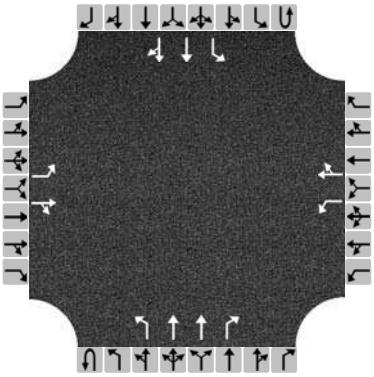
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	1	9		14	0	36		10	1447	25		64	665	51
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		10		14		37		10				66		
Capacity		148		392		99		361		877				446		
v/c Ratio		0.18		0.03		0.14		0.10		0.01				0.15		
95% Queue Length		0.6		0.1		0.5		0.3		0.0				0.5		
Control Delay (s/veh)		34.6		14.4		47.0		16.1		9.2				14.5		
Level of Service (LOS)		D		B		E		C		A				B		
Approach Delay (s/veh)	29.2				24.6				0.1				1.2			
Approach LOS	D				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

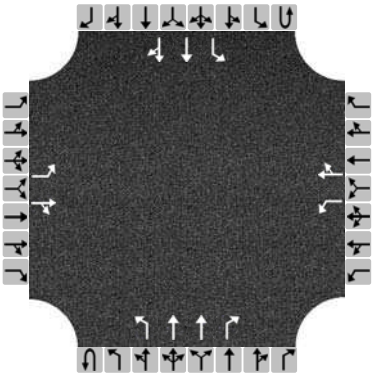
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	3	16		21	4	50		6	1014	17		43	1018	105
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		20		22		56		6				45		
Capacity		132		333		158		417		605				657		
v/c Ratio		0.20		0.06		0.14		0.13		0.01				0.07		
95% Queue Length		0.7		0.2		0.5		0.5		0.0				0.2		
Control Delay (s/veh)		39.0		16.5		31.4		15.0		11.0				10.9		
Level of Service (LOS)		E		C		D		B		B				B		
Approach Delay (s/veh)	29.4				19.6				0.1				0.4			
Approach LOS	D				C				A				A			

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HCS 2010 Two-Way Stop Control Summary Report

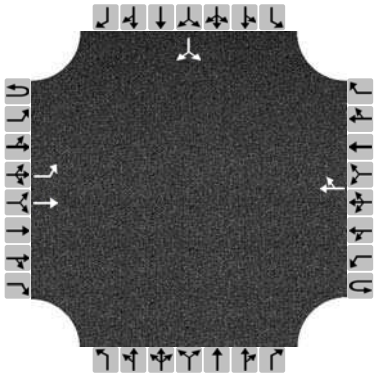
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		31	70				263	0						1		13
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		39													17	
Capacity		1242													708	
v/c Ratio		0.03													0.02	
95% Queue Length		0.1													0.1	
Control Delay (s/veh)		8.0													10.2	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	2.5												10.2			
Approach LOS	A												B			

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HCS 2010 Two-Way Stop Control Summary Report

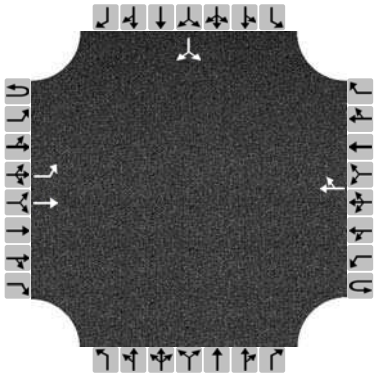
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		28	234				212	2						16		38
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		35													68	
Capacity		1309													681	
v/c Ratio		0.03													0.10	
95% Queue Length		0.1													0.3	
Control Delay (s/veh)		7.8													10.9	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.8												10.9			
Approach LOS	A												B			

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HCS 2010 Two-Way Stop Control Summary Report

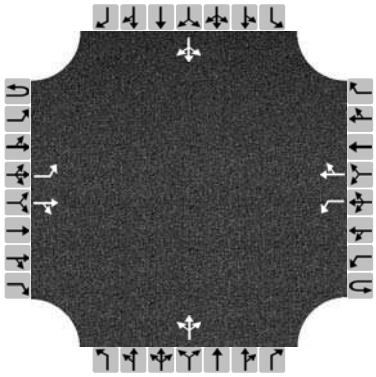
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and east dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Eastern Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		11	57	3		0	205	0		12	0	0		0	0	46
Percent Heavy Vehicles		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		14									15				58	
Capacity		1321				1537					571				788	
v/c Ratio		0.01									0.03				0.07	
95% Queue Length		0.0									0.1				0.2	
Control Delay (s/veh)		7.8				7.3					11.5				9.9	
Level of Service (LOS)		A				A					B				A	
Approach Delay (s/veh)	1.2								11.5				9.9			
Approach LOS	A								B				A			

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HCS 2010 Two-Way Stop Control Summary Report

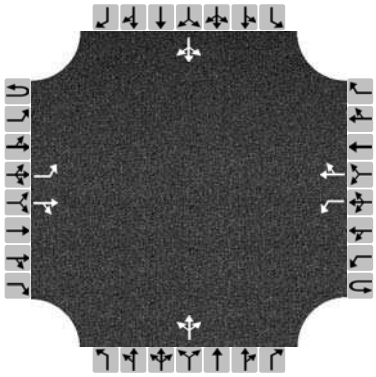
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and east dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Eastern Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		45	193	12		0	184	0		6	0	0		0	0	24
Percent Heavy Vehicles		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		56									8				30	
Capacity		1350				1321					475				814	
v/c Ratio		0.04									0.02				0.04	
95% Queue Length		0.1									0.1				0.1	
Control Delay (s/veh)		7.8				7.7					12.7				9.6	
Level of Service (LOS)		A				A					B				A	
Approach Delay (s/veh)	1.4								12.7				9.6			
Approach LOS	A								B				A			

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HCS 2010 Two-Way Stop Control Summary Report

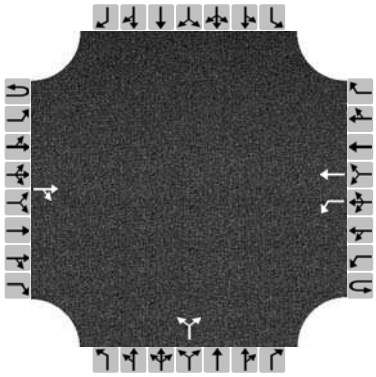
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and west dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western project dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	1	1	0		0	0	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			86	45		11	265			66		15				
Percent Heavy Vehicles						0				0		0				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						14					101					
Capacity						1427					596					
v/c Ratio						0.01					0.17					
95% Queue Length						0.0					0.6					
Control Delay (s/veh)						7.5					12.3					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					0.3				12.3							
Approach LOS					A				B							

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HCS 2010 Two-Way Stop Control Summary Report

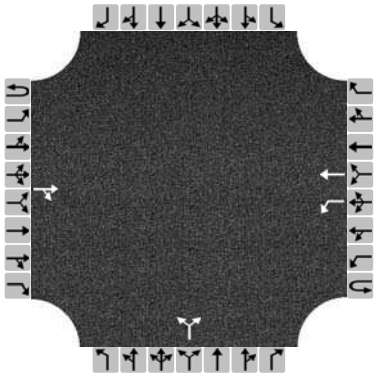
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and west dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western project dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	1	1	0		0	0	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			255	37		8	242			31		7				
Percent Heavy Vehicles						0				0		0				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						10					48					
Capacity						1205					513					
v/c Ratio						0.01					0.09					
95% Queue Length						0.0					0.3					
Control Delay (s/veh)						8.0					12.7					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					0.3				12.7							
Approach LOS					A				B							

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HCS 2010 Two-Way Stop Control Summary Report

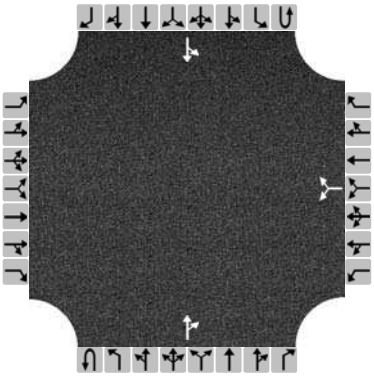
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	Home Depot and Apt Dwy
Jurisdiction	Franklin, TN
East/West Street	Project Driveway
North/South Street	Home Depot Access
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						46		37			0	11		10	0	
Percent Heavy Vehicles						0		0						0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							104							12		
Capacity							1023							1618		
v/c Ratio							0.10							0.01		
95% Queue Length							0.3							0.0		
Control Delay (s/veh)							8.9							7.2		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					8.9								7.2			
Approach LOS					A								A			

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HCS 2010 Two-Way Stop Control Summary Report

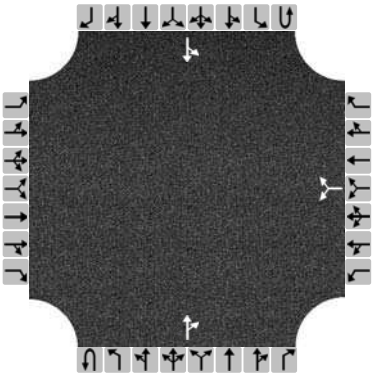
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	Home Depot and Apt Dwy
Jurisdiction	Franklin, TN
East/West Street	Project Driveway
North/South Street	Home Depot Access
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						24		20			0	45		37	0	
Percent Heavy Vehicles						0		0						0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							55							46		
Capacity							935							1562		
v/c Ratio							0.06							0.03		
95% Queue Length							0.2							0.1		
Control Delay (s/veh)							9.1							7.4		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					9.1								7.4			
Approach LOS					A								A			

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TOTAL PROJECTED CONDITIONS
With a third northbound through lane

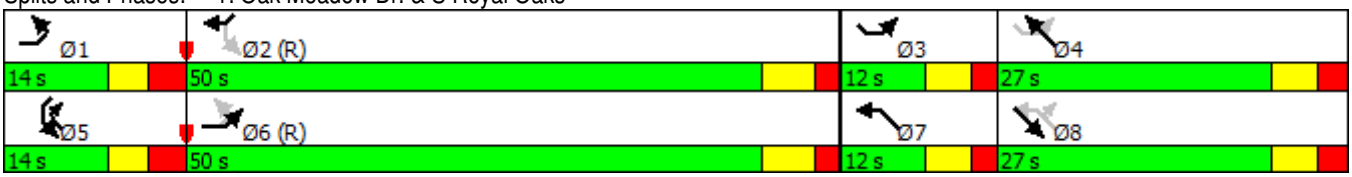
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Future Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		2	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.94	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt		0.989			0.885				0.850		0.850	
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1534	4801	0	1711	1594	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.271	0.956		0.715			0.495			0.177		
Satd. Flow (perm)	437	4801	0	1287	1594	0	922	1925	1583	330	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		154			97				90		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	92	163	29	97	87	64	249	75	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1283	0	163	126	0	87	64	249	75	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		41			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42		42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45		45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot		D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6			4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0		7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0		12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0		12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%		11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0		6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0		3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0		2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5		-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5		3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0		1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min		None	None		None	None	None	None	C-Min	
Act Effct Green (s)	71.0	60.1		20.0	12.3		20.0	12.3	25.3	70.3	59.8	
Actuated g/C Ratio	0.69	0.58		0.19	0.12		0.19	0.12	0.25	0.68	0.58	
v/c Ratio	0.32	0.45		0.57	0.46		0.34	0.28	0.55	0.21	0.47	
Control Delay	7.7	11.8		41.9	18.6		34.8	43.6	25.6	6.9	11.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.7	11.8		41.9	18.6		34.8	43.6	25.6	6.9	11.8	
LOS	A	B		D	B		C	D	C	A	B	
Approach Delay		11.4			31.7			30.5		11.4		
Approach LOS		B			C			C		B		
90th %ile Green (s)	8.0	52.3		6.5	13.7		6.5	13.7	7.0	7.0	51.3	
90th %ile Term Code	Max	Coord		Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.8	55.3		6.5	10.7		6.5	10.7	7.0	7.0	54.5	
70th %ile Term Code	Gap	Coord		Max	Hold		Max	Gap	Min	Min	Coord	
50th %ile Green (s)	7.0	56.6		6.5	9.4		6.5	9.4	7.0	7.0	56.6	
50th %ile Term Code	Min	Coord		Max	Hold		Max	Gap	Min	Min	Coord	
30th %ile Green (s)	7.0	57.9		6.5	8.1		6.5	8.1	7.0	7.0	57.9	
30th %ile Term Code	Min	Coord		Max	Hold		Max	Gap	Min	Min	Coord	
10th %ile Green (s)	7.0	71.0		7.5	7.0		0.0	0.0	7.0	7.0	71.0	
10th %ile Term Code	Min	Coord		Hold	Min		Skip	Skip	Min	Min	Coord	
Stops (vph)	27	567		112	27		51	33	126	18	271	
Fuel Used(gal)	1	11		2	1		1	1	4	1	10	
CO Emissions (g/hr)	46	771		162	68		96	62	270	62	724	
NOx Emissions (g/hr)	9	150		32	13		19	12	52	12	141	
VOC Emissions (g/hr)	11	179		38	16		22	14	63	14	168	
Dilemma Vehicles (#)	0	0		0	0		0	2	0	0	0	
Queue Length 50th (ft)	25	144		91	17		46	39	90	14	131	
Queue Length 95th (ft)	37	198		124	22		69	48	161	26	152	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70		75			100		195	180		
Base Capacity (vph)	415	2866		287	438		253	439	470	374	1681	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.31	0.45		0.57	0.29		0.34	0.15	0.53	0.20	0.47	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 52.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Future Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.993			0.934			0.868	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	4884	0	1787	3428	0	1754	1624	0	1787	1520	0
Flt Permitted	0.315			0.119			0.552			0.463		
Satd. Flow (perm)	556	4884	0	224	3428	0	1019	1624	0	871	1520	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			4			27			137	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	44	1387	118	343	778	37	10	68	53	49	19	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1505	0	343	815	0	10	121	0	49	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226		42	226		42	42		42	42	
Trailing Detector (ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6		45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0		5.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	17.0	73.0		17.0	73.0		10.0	50.0		10.0	50.0	
Total Split (s)	17.0	73.0		17.0	73.0		10.0	50.0		10.0	50.0	
Total Split (%)	11.3%	48.7%		11.3%	48.7%		6.7%	33.3%		6.7%	33.3%	
Maximum Green (s)	10.5	67.0		10.5	67.0		6.0	43.0		6.0	43.0	
Yellow Time (s)	3.0	3.5		3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5		3.5	2.5		0.5	3.5		0.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0		5.5	3.0		1.5	4.5		1.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.0	3.5		3.0	3.5	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0			8.0			8.0	
Flash Dont Walk (s)		16.0			20.0			32.0			35.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	103.4	97.8		110.4	103.7		27.4	17.2		30.7	23.3	
Actuated g/C Ratio	0.69	0.65		0.74	0.69		0.18	0.11		0.20	0.16	
v/c Ratio	0.10	0.47		1.21	0.34		0.04	0.58		0.20	0.44	
Control Delay	7.4	14.7		144.4	11.7		42.7	58.7		46.7	15.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.4	14.7		144.4	11.7		42.7	58.7		46.7	15.6	
LOS	A	B		F	B		D	E		D	B	
Approach Delay		14.5			51.0			57.5			23.0	
Approach LOS		B			D			E			C	
90th %ile Green (s)	8.6	83.8		10.5	85.7		7.3	21.2		11.0	24.9	
90th %ile Term Code	Gap	Coord		Max	Coord		Gap	Gap		Gap	Hold	
70th %ile Green (s)	7.6	89.2		10.5	92.1		6.6	17.3		9.5	20.2	
70th %ile Term Code	Gap	Coord		Max	Coord		Gap	Gap		Gap	Hold	
50th %ile Green (s)	7.0	92.8		10.5	96.3		0.0	14.7		8.5	27.2	
50th %ile Term Code	Gap	Coord		Max	Coord		Skip	Gap		Gap	Hold	
30th %ile Green (s)	6.5	96.5		10.5	100.5		0.0	12.1		7.4	23.5	
30th %ile Term Code	Gap	Coord		Max	Coord		Skip	Gap		Gap	Hold	
10th %ile Green (s)	0.0	111.7		10.5	128.7		0.0	8.3		0.0	8.3	
10th %ile Term Code	Skip	Coord		Max	Coord		Skip	Gap		Skip	Hold	
Stops (vph)	9	673		99	323		5	63		26	25	
Fuel Used(gal)	0	25		10	9		0	2		1	1	
CO Emissions (g/hr)	31	1769		720	601		9	142		41	75	
NOx Emissions (g/hr)	6	344		140	117		2	28		8	15	
VOC Emissions (g/hr)	7	410		167	139		2	33		10	17	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (ft)	11	264		~167	174		8	88		39	15	
Queue Length 95th (ft)	19	354		#399	261		14	105		52	21	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80			220			100			120		
Base Capacity (vph)	481	3188		284	2370		229	511		245	556	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

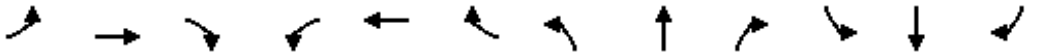
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.09	0.47		1.21	0.34		0.04	0.24		0.20	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 139 (93%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.21			
Intersection Signal Delay: 30.8		Intersection LOS: C	
Intersection Capacity Utilization 62.3%		ICU Level of Service B	
Analysis Period (min) 15			

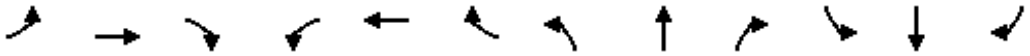
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Future Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				149					31	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	914	1091	319	121	340	1134	245	288	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	914	1091	319	121	340	1134	245	389	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

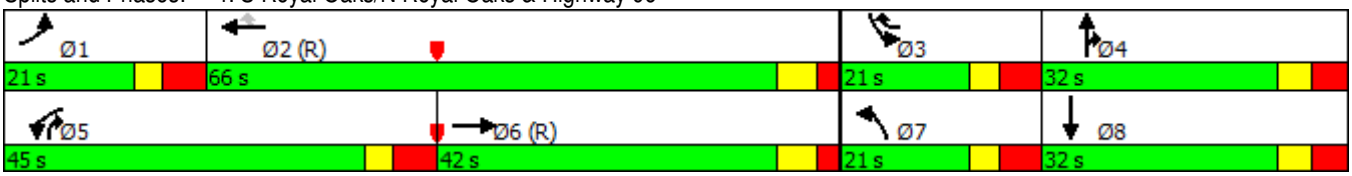


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.5	38.4		40.0	64.9	84.0	12.4	27.5	72.0	15.1	30.2	
Actuated g/C Ratio	0.10	0.27		0.29	0.46	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.43	0.72		0.97	0.69	0.31	0.41	0.48	0.77	0.69	0.54	
Control Delay	76.8	41.3		61.0	40.4	8.7	64.1	52.4	31.8	70.7	48.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	76.8	41.3		61.0	40.4	8.7	64.1	52.4	31.8	70.7	48.2	
LOS	E	D		E	D	A	E	D	C	E	D	
Approach Delay		46.0			44.1			38.6			56.9	
Approach LOS		D			D			D			E	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	13.3	24.5		13.5	24.7	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.4	35.5		37.5	60.6	13.5	11.6	24.5		13.5	26.4	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	11.2	35.5		37.5	61.8	13.5	10.4	24.5		13.5	27.6	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.9	35.5		37.5	63.1	13.5	9.2	24.5		13.5	28.8	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	8.1	37.6		37.5	67.0	11.4	7.5	24.5		11.4	28.4	
10th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	110	737		759	947	98	92	236	829	214	238	
Fuel Used(gal)	3	18		25	25	4	2	6	18	6	6	
CO Emissions (g/hr)	235	1272		1740	1782	261	169	412	1253	427	449	
NOx Emissions (g/hr)	46	247		338	347	51	33	80	244	83	87	
VOC Emissions (g/hr)	54	295		403	413	60	39	95	290	99	104	
Dilemma Vehicles (#)	0	28		0	36	0	0	0	0	0	0	
Queue Length 50th (ft)	69	285		419	535	78	54	145	459	112	153	
Queue Length 95th (ft)	93	338		m#446	m544	m122	78	172	561	159	167	
Internal Link Dist (ft)		620			611			712			884	

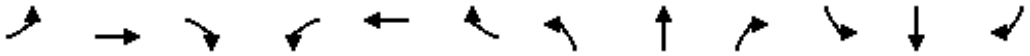
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1293		938	1578	1035	370	714	1473	367	723	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.72		0.97	0.69	0.31	0.33	0.48	0.77	0.67	0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 44.4		Intersection LOS: D	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Future Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			184									115
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.5	60.5	15.5	81.0					49.5		49.5
Actuated g/C Ratio		0.43	0.43	0.11	0.58					0.35		0.35
v/c Ratio		0.72	0.29	0.65	0.62					0.36		1.09
Control Delay		27.6	5.1	71.8	19.3					34.6		94.9
Queue Delay		0.8	0.0	0.0	0.3					2.1		0.0
Total Delay		28.3	5.1	71.8	19.5					36.7		94.9
LOS		C	A	E	B					D		F
Approach Delay		26.0			24.5							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		57.6	57.6	15.4	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		59.8	59.8	13.2	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.2	63.2	9.8	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		1165	39	111	497					256		836
Fuel Used(gal)		36	2	3	13					6		31
CO Emissions (g/hr)		2510	152	219	912					431		2177
NOx Emissions (g/hr)		488	30	43	177					84		423
VOC Emissions (g/hr)		582	35	51	211					100		504
Dilemma Vehicles (#)		50	0	0	34					0		0
Queue Length 50th (ft)		346	27	124	283					144		~602
Queue Length 95th (ft)		406	m47	m164	m297					178		#754
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2743	756	229	1960					1162		1012
Starvation Cap Reductn		0	0	0	215					0		0
Spillback Cap Reductn		420	0	0	0					581		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.85	0.29	0.56	0.70					0.72		1.09

Intersection Summary

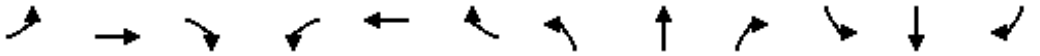
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 41.6		Intersection LOS: D	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

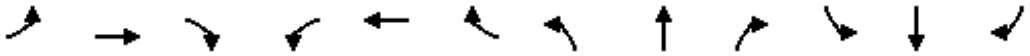
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Future Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			252			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.33	0.34			0.59	0.77	1.10		0.96			
Control Delay	204.9	3.4			36.8	27.0	131.8		56.6			
Queue Delay	0.7	0.1			0.0	0.0	0.0		0.0			
Total Delay	205.5	3.5			36.8	27.0	131.8		56.6			
LOS	F	A			D	C	F		E			
Approach Delay		132.8			30.8							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	1003	107			597	899	350		119			
Fuel Used(gal)	73	4			13	18	15		7			
CO Emissions (g/hr)	5083	310			923	1264	1025		474			
NOx Emissions (g/hr)	989	60			180	246	200		92			
VOC Emissions (g/hr)	1178	72			214	293	238		110			
Dilemma Vehicles (#)	0	18			27	0	0		0			
Queue Length 50th (ft)	~951	67			306	468	~228		142			
Queue Length 95th (ft)	#1078	75			375	573	#338		#351			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		414			
Starvation Cap Reductn	163	623			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.55	0.45			0.59	0.77	1.10		0.96			

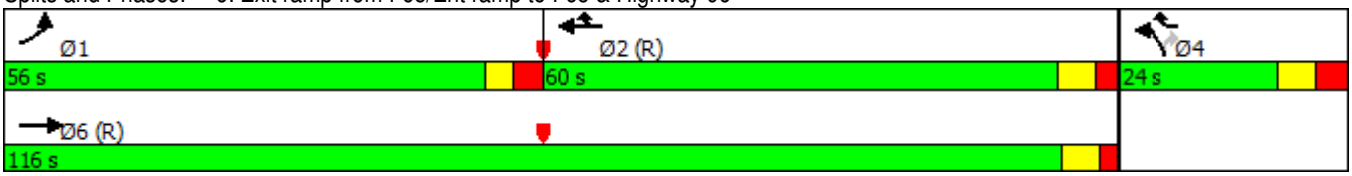
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.33			
Intersection Signal Delay: 87.9		Intersection LOS: F	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Future Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		2	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.94	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt		0.989			0.906				0.850		0.850	
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1534	4801	0	1711	1631	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.083	0.956		0.704			0.285			0.261		
Satd. Flow (perm)	134	4801	0	1268	1631	0	531	1925	1583	486	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		132			68				132		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	71	186	97	162	152	66	132	255	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	951	0	186	259	0	152	66	132	255	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		41			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42		42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45		45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot		D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6			4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0		7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0		14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0		14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%		11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0		8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0		3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0		2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5		-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5		3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0		1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min		None	None		None	None	None	None	C-Min	
Act Effct Green (s)	74.5	61.4		34.8	22.9		34.2	21.9	36.7	70.9	59.5	
Actuated g/C Ratio	0.62	0.51		0.29	0.19		0.28	0.18	0.31	0.59	0.50	
v/c Ratio	0.61	0.38		0.44	0.71		0.58	0.19	0.23	0.64	0.85	
Control Delay	29.2	16.3		34.6	43.2		39.1	39.7	5.3	20.1	31.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	29.2	16.3		34.6	43.2		39.1	39.7	5.3	20.1	31.8	
LOS	C	B		C	D		D	D	A	C	C	
Approach Delay		17.9			39.6			26.5		29.8		
Approach LOS		B			D			C		C		
90th %ile Green (s)	12.0	51.3		8.5	28.7		8.5	28.7	8.0	8.0	47.3	
90th %ile Term Code	Max	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	56.1		8.5	23.9		8.5	23.9	8.0	8.0	52.1	
70th %ile Term Code	Max	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	10.3	59.6		8.5	20.4		8.5	20.4	8.0	8.0	57.3	
50th %ile Term Code	Gap	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
30th %ile Green (s)	7.7	63.0		8.5	17.0		8.5	17.0	8.0	8.0	63.3	
30th %ile Term Code	Gap	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
10th %ile Green (s)	7.0	69.7		25.5	11.9		7.6	0.0	7.3	7.3	70.0	
10th %ile Term Code	Min	Coord		Hold	Gap		Gap	Skip	Gap	Gap	Coord	
Stops (vph)	47	445		112	120		84	31	14	91	658	
Fuel Used(gal)	1	9		2	3		2	1	1	4	21	
CO Emissions (g/hr)	84	637		165	215		171	59	71	259	1472	
NOx Emissions (g/hr)	16	124		32	42		33	12	14	50	286	
VOC Emissions (g/hr)	19	148		38	50		40	14	17	60	341	
Dilemma Vehicles (#)	0	0		0	0		0	2	0	0	0	
Queue Length 50th (ft)	42	130		111	140		88	43	0	78	422	
Queue Length 95th (ft)	70	188		135	108		105	49	40	116	447	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70		75			100		195	180		
Base Capacity (vph)	254	2522		421	478		265	505	578	400	1448	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.54	0.38		0.44	0.54		0.57	0.13	0.23	0.64	0.85	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 26.9	Intersection LOS: C
Intersection Capacity Utilization 58.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

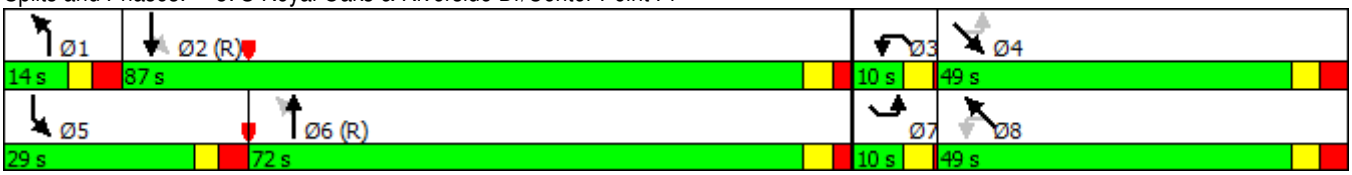
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Future Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.987			0.906			0.876	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	4913	0	1805	3447	0	1736	1672	0	1752	1593	0
Flt Permitted	0.116			0.138			0.111			0.421		
Satd. Flow (perm)	205	4913	0	262	3447	0	203	1672	0	776	1593	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			10			52			151	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	114	1161	42	351	1251	122	97	90	150	61	66	319
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1203	0	351	1373	0	97	240	0	61	385	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226		42	226		42	42		42	42	
Trailing Detector (ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6		45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												

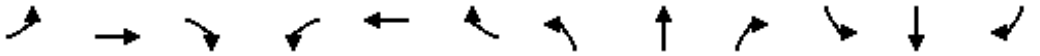
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0		5.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	15.0	70.0		30.0	85.0		10.0	50.0		10.0	50.0	
Total Split (s)	14.0	72.0		29.0	87.0		10.0	49.0		10.0	49.0	
Total Split (%)	8.8%	45.0%		18.1%	54.4%		6.3%	30.6%		6.3%	30.6%	
Maximum Green (s)	7.5	66.0		22.5	81.0		6.0	42.0		6.0	42.0	
Yellow Time (s)	3.0	3.5		3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5		3.5	2.5		0.5	3.5		0.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0		5.5	3.0		1.5	4.5		1.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.0	3.5		3.0	3.5	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0			8.0			8.0	
Flash Dont Walk (s)		16.0			20.0			32.0			35.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	82.3	76.3		101.9	90.4		50.8	38.1		47.3	33.7	
Actuated g/C Ratio	0.51	0.48		0.64	0.56		0.32	0.24		0.30	0.21	
v/c Ratio	0.62	0.51		0.91	0.70		0.52	0.55		0.21	0.85	
Control Delay	33.6	31.2		56.7	28.8		47.7	45.7		37.6	53.0	
Queue Delay	0.0	0.0		0.0	1.2		0.0	0.0		0.0	0.0	
Total Delay	33.6	31.2		56.7	30.0		47.7	45.7		37.6	53.0	
LOS	C	C		E	C		D	D		D	D	
Approach Delay		31.4			35.4			46.2			50.9	
Approach LOS		C			D			D			D	
90th %ile Green (s)	7.5	65.5		22.5	80.5		6.5	42.0		6.5	42.0	
90th %ile Term Code	Max	Coord		Max	Coord		Max	Hold		Max	Max	
70th %ile Green (s)	7.5	62.9		22.5	77.9		14.1	40.7		10.4	37.0	
70th %ile Term Code	Max	Coord		Max	Coord		Gap	Hold		Gap	Gap	
50th %ile Green (s)	7.5	69.8		22.5	84.8		12.4	34.9		9.3	31.8	
50th %ile Term Code	Max	Coord		Max	Coord		Gap	Hold		Gap	Gap	
30th %ile Green (s)	7.5	76.8		22.5	91.8		10.8	29.1		8.1	26.4	
30th %ile Term Code	Max	Coord		Max	Coord		Gap	Hold		Gap	Gap	
10th %ile Green (s)	7.5	91.6		17.8	101.9		8.5	31.1		0.0	18.6	
10th %ile Term Code	Max	Coord		Gap	Coord		Gap	Hold		Skip	Gap	
Stops (vph)	47	770		142	868		57	127		30	220	
Fuel Used(gal)	2	26		5	19		2	4		1	7	
CO Emissions (g/hr)	141	1800		381	1361		122	268		49	456	
NOx Emissions (g/hr)	27	350		74	265		24	52		10	89	
VOC Emissions (g/hr)	33	417		88	315		28	62		11	106	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (ft)	47	327		224	547		72	175		44	248	
Queue Length 95th (ft)	70	394		262	676		110	181		65	340	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80			220			100			120		
Base Capacity (vph)	183	2367		393	1967		188	502		294	552	
Starvation Cap Reductn	0	0		0	349		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.62	0.51		0.89	0.85		0.52	0.48		0.21	0.70	

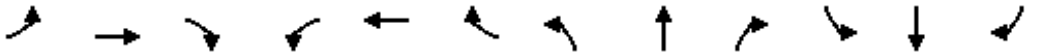
Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 123 (77%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 160			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 36.8		Intersection LOS: D	
Intersection Capacity Utilization 80.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Future Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					44	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1122	1290	302	191	443	1122	381	489	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1122	1290	302	191	443	1122	381	712	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

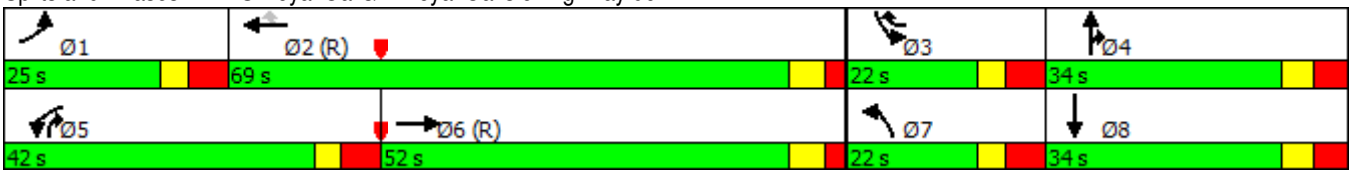


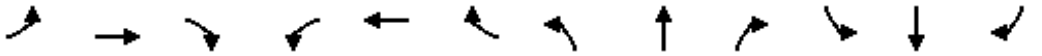
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.36	0.81	0.30	0.55	0.61	0.82	1.02	0.98	
Control Delay	68.7	44.7		200.8	49.2	16.6	70.5	59.0	40.1	117.0	84.1	
Queue Delay	0.0	0.0		0.0	0.6	0.0	0.1	0.0	0.1	0.0	0.0	
Total Delay	68.7	44.7		200.8	49.8	16.6	70.7	59.0	40.3	117.0	84.1	
LOS	E	D		F	D	B	E	E	D	F	F	
Approach Delay		48.3			108.5			48.3			95.5	
Approach LOS		D			F			D			F	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	16.7	45.5		34.5	63.3	14.5	14.5	26.5		14.5	26.5	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)	15.1	45.5		34.5	64.9	14.5	13.5	26.5		14.5	27.5	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	13.4	45.5		34.5	66.6	14.5	12.0	26.5		14.5	29.0	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	11.1	45.5		34.5	68.9	14.5	9.8	26.5		14.5	31.2	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	191	938		759	1064	208	131	330	843	280	539	
Fuel Used(gal)	6	25		55	32	5	4	9	19	11	19	
CO Emissions (g/hr)	401	1778		3861	2216	359	253	595	1327	800	1315	
NOx Emissions (g/hr)	78	346		751	431	70	49	116	258	156	256	
VOC Emissions (g/hr)	93	412		895	514	83	59	138	308	185	305	
Dilemma Vehicles (#)	0	44		0	45	0	0	0	0	0	0	
Queue Length 50th (ft)	107	316		~759	580	139	92	210	528	~203	~352	
Queue Length 95th (ft)	155	368		m#567	m517	m125	108	246	624	#272	#505	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	725	
Starvation Cap Reductn	0	0		0	0	0	0	0	15	0	0	
Spillback Cap Reductn	0	0		0	84	0	10	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.80		1.36	0.85	0.30	0.51	0.61	0.83	1.02	0.98	

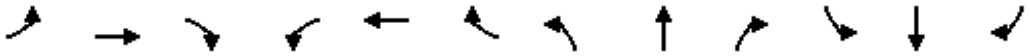
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.36			
Intersection Signal Delay: 78.8		Intersection LOS: E	
Intersection Capacity Utilization 90.0%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Future Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			400									135
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.99	0.78	1.35	0.58					0.77		1.43
Control Delay		72.0	30.6	226.4	26.5					43.9		229.0
Queue Delay		1.3	0.0	0.0	0.9					1.8		0.0
Total Delay		73.3	30.6	226.4	27.4					45.7		229.0
LOS		E	C	F	C					D		F
Approach Delay		63.7			81.4							
Approach LOS		E			F							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1876	474	222	498					776		998
Fuel Used(gal)		64	12	16	13					18		82
CO Emissions (g/hr)		4472	814	1146	935					1262		5755
NOx Emissions (g/hr)		870	158	223	182					246		1120
VOC Emissions (g/hr)		1036	189	266	217					292		1334
Dilemma Vehicles (#)		105	0	0	51					0		0
Queue Length 50th (ft)		637	324	~525	287					457		~1192
Queue Length 95th (ft)		m#693	m295	#521	430					515		#1297
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	802	297	1865					1368		1155
Starvation Cap Reductn		0	0	0	464					0		0
Spillback Cap Reductn		14	0	0	0					172		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.99	0.78	1.35	0.77					0.88		1.43

Intersection Summary

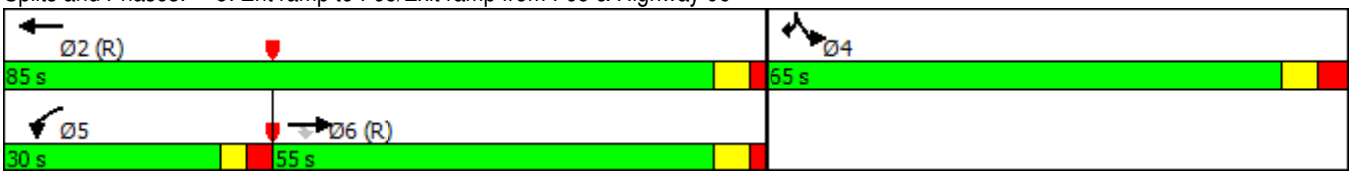
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 103.9		Intersection LOS: F	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			

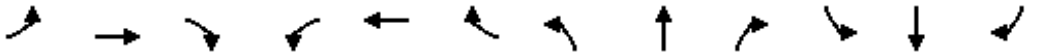
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

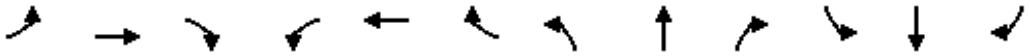
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Future Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						226			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

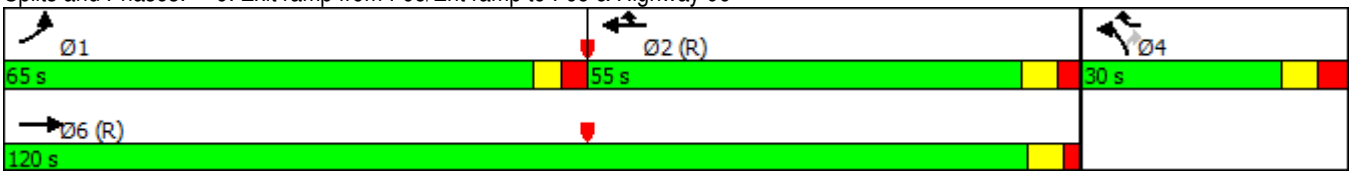


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	37.2	114.6			70.9	102.3	21.9		21.9			
Actuated g/C Ratio	0.25	0.76			0.47	0.68	0.15		0.15			
v/c Ratio	0.79	0.91			0.59	0.54	0.71		0.65			
Control Delay	79.7	23.9			31.8	10.9	69.9		48.9			
Queue Delay	0.0	5.4			0.0	0.0	0.0		0.0			
Total Delay	79.7	29.3			31.8	10.9	69.9		48.9			
LOS	E	C			C	B	E		D			
Approach Delay		40.1			20.9							
Approach LOS		D			C							
90th %ile Green (s)	45.2	114.0			62.3		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	40.9	114.0			66.6		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	37.2	114.0			70.3		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	34.1	114.0			73.4		22.5		22.5			
30th %ile Term Code	Gap	Coord			Coord		Max		Max			
10th %ile Green (s)	28.8	117.2			81.9		19.3		19.3			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	610	1847			646	395	295		100			
Fuel Used(gal)	18	38			23	19	7		3			
CO Emissions (g/hr)	1284	2656			1632	1299	521		208			
NOx Emissions (g/hr)	250	517			317	253	101		40			
VOC Emissions (g/hr)	298	615			378	301	121		48			
Dilemma Vehicles (#)	0	83			30	0	0		0			
Queue Length 50th (ft)	342	589			366	218	165		112			
Queue Length 95th (ft)	m344	m499			485	327	222		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2575			1672	1982	495		298			
Starvation Cap Reductn	0	199			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.50	0.99			0.59	0.54	0.69		0.63			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 35.1		Intersection LOS: D	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



APPENDIX D
TRIP GENERATION

TRIP GENERATION CALCULATIONS – Assisted Living

The following calculations are based on the data compiled for ITE Land Use Code 254.

Average Daily Traffic

T = 2.74 (X)
T = 2.74 (**208**)
T = 570 vehicles

Enter = 0.50 (570) = 285 vehicles
Exit = 0.50 (570) = 285 vehicles

AM traffic during peak hour of adjacent street

T = 0.23 (X)
T = 0.23 (**208**)
T = 47 vehicles

Enter = 0.72 (47) = 34 vehicles
Exit = 0.28 (47) = 13 vehicles

PM traffic during peak hour of adjacent street

T = 0.37 (X)
T = 0.37 (**208**)
T = 77 vehicles

Enter = 0.39 (77) = 30 vehicles
Exit = 0.61 (77) = 47 vehicles

TRIP GENERATION CALCULATIONS – Multi-Family (South)

The following calculations are based on the data compiled for ITE Land Use Code 220.

Average Daily Traffic

T = 6.65 (X)
T = 6.65 (**98**)
T = 652 vehicle-trips

Enter = 0.50 (652) = 326 vehicles
Exit = 0.50 (652) = 326 vehicles

A.M. traffic during peak hour of adjacent street

T = 0.51 (X)
T = 0.51 (**98**)
T = 50 vehicle-trips

Enter = 0.20 (50) = 10 vehicles
Exit = 0.80 (50) = 40 vehicles

P.M. traffic during peak hour of adjacent street

T = 0.62 (X)
T = 0.62 (**98**)
T = 60 vehicle-trips

Enter = 0.65 (60) = 39 vehicles
Exit = 0.35 (60) = 21 vehicles

TRIP GENERATION CALCULATIONS – Multi-Family (North)

The following calculations are based on the data compiled for ITE Land Use Code 220.

Average Daily Traffic

T = 6.65 (X)
T = 6.65 (**204**)
T = 1,356 vehicle-trips

Enter = 0.50 (1,356) = 678 vehicles
Exit = 0.50 (1,356) = 678 vehicles

A.M. traffic during peak hour of adjacent street

T = 0.51 (X)
T = 0.51 (**204**)
T = 104 vehicle-trips

Enter = 0.20 (104) = 21 vehicles
Exit = 0.80 (104) = 83 vehicles

P.M. traffic during peak hour of adjacent street

T = 0.62 (X)
T = 0.62 (**204**)
T = 126 vehicle-trips

Enter = 0.65 (126) = 82 vehicles
Exit = 0.35 (126) = 44 vehicles

TRIP GENERATION CALCULATIONS – Specialty Retail

The following calculations are based on the data compiled for ITE Land Use Code 826.

Average Daily Traffic

T = 44.32 (X)
T = 44.32 (**15.000**)
T = 664 vehicle-trips

Enter = 0.50 (664) = 332 vehicles
Exit = 0.50 (664) = 332 vehicles

A.M. traffic during peak hour of adjacent street

T = 6.84 (X)
T = 6.84 (**15.000**)
T = 102 vehicle-trips

Enter = 0.48 (102) = 49 vehicles
Exit = 0.52 (102) = 53 vehicles

P.M. traffic during peak hour of adjacent street

T = 2.71 (X)
T = 2.71 (**15.000**)
T = 41 vehicle-trips

Enter = 0.44 (41) = 18 vehicles
Exit = 0.56 (41) = 23 vehicles

HISTORIC FRANKLIN TENNESSEE

MEMORANDUM

DATE: April 20, 2016

TO: Franklin Municipal Planning Commission

FROM: Amy Diaz-Barriga, Current Planning Supervisor
Bob Martin, Interim Director of Planning and Sustainability

Subject

..title

Consideration Of Resolution 2016-20, To Be Entitled: "A Resolution Approving A Development Plan For Epoch Development PUD Subdivision With 1 Modifications Of Development Standards (Parking Reduction), For The Property Located West Of Interstate 65, At 840 And 880 Oak Meadow Drive."

..body

Project Information

COF Project Number: 6086
Applicant: **Adam Crunk, Crunk Engineering**
Owner: **Warner Bass**

Background/Staff Comments

The design of this plan is to accommodate buildings and parking lots, with no regard to the open space that will benefit the residents. This means that ***there will be too much density and surface parking*** for the site. None of their buildings seem to have a primary entrance, and seven of the entry points into the building violate the requirement that "primary entrances or facades shall not be oriented towards off-street parking lots, garages, or carports", per section 5.3.5(3)(a)(ii) of the Zoning Ordinance. They are not providing the required amount of green space within their formal open spaces. Section 5.5.3(5)(iii)(A) of the Zoning Ordinance states that "no more than 25 percent of the formal open space set-aside shall be paved." Their plan includes the leasing/amenity center, the pool house, and both pools in their formal open space calculations, and this amount of impervious surface amounts to approximately 40 percent of their provided formal open space. The leasing offices within the Leasing/Amenity Center building cannot be considered as part of their formal open space. Furthermore, all of the green open spaces that *are* within the plan seem to be "throw away" spaces, without being integrated into the plan and without consideration for how these spaces could benefit the residents.

Beyond open space and building orientation, there are other issues with the site. There will be no traffic-calming devices along the drive aisle that parallels the I-65 corridor. It is over 800 feet in length, and without a jog in the vehicular path or other traffic calming designs, drivers can gain considerable speeds that create an unsafe environment for both residents and visitors. Engineering is also skeptical that a fire truck can make the turning radius shown on the driveway connecting to the access drive to

Home Depot. While the turn is shown to work in two-dimensions on the plan, this driveway is sloping at an angle such that, without a profile of the intersection, there is a concern that the fire truck may tip over trying to make a turn. In terms of stormwater, Engineering feels that the small amount of detention shown, as well as the lack of any water-quality areas shown, very well may be insufficient to make the plan feasible. There is also a concern that the grading along Oak Meadow Drive for the northern portion of the site is shown within the right-of-way, which is prohibited. As this area of the plan is graded now, water would run down this hill directly onto the right-of-way, without being captured in any way for detention and water quality. Lastly, the volume of water being re-directed to the north of the property is cause for concern without verifying the size of the existing pipe, which this plan had not done.

Project Considerations

Project Considerations are not conditions of this approval, but are intended to highlight issues that should be considered in the overall site design or may be required when more detailed plans are submitted for review. These items are not meant to be exhaustive and all City requirements and ordinances must be met with each plan submittal.

This plan has no rational nexus between the open spaces and their usefulness for the residents. A plan that increases the heights and reduces the footprints of these buildings, and incorporates parking structures into the site, could open the door to a design that creates thoughtful and usable open spaces for the residents, as well as more spaces for stormwater requirements.

Modifications of Standards

The applicant is requesting a modification of standards to the minimum parking standards provided in Table 5-9 of the Zoning Ordinance. The table requires 1.5 spaces for every one-bedroom unit, 2.5 spaces for every two-bedroom unit, and 3 spaces for every three-bedroom unit. With their breakdown of unit types, the plan requires an equivalent to 2.14 parking spaces per unit. The applicant is requesting to use a calculation of 1.75 parking spaces per unit. The requirements of Table 5-9 were recently revised to reduce the required parking spaces for multifamily uses. In 2013, Planning did a study of parking requirements and corresponding demand of the multifamily uses within Franklin, in response for several Modifications of Standards to reduce required parking standards. After the study was completed, it found that while a reduction in the parking requirements was warranted, and some developments that requested parking reductions were now undersized to meet their actual parking demand. A revision to Table 5-9 was approved, and it was understood at the time that Planning would no longer support a modification of standards for reduced parking on attached residential uses.

Further, the Fire Department has had several issues with attached residential developments and their parking lots. Several developments seem to be underparked, and residents or visitors have resorted to parking along drive aisles or within fire lanes, making access for fire trucks a serious concern. Specifically, Dwell has been cited by Fire many times for parking in drive aisles. Additional fire lane striping has been painted onto these drive aisles, and residents still continue to park in these illegal areas. Dwell has even contact Wayne Mobley with Fire and has asked how they can create more

parking on-site. It is important to remember that Dwell received a Modification of Standards for a reduced parking standard that equated to 1.91 parking spaces per unit.

Because of the recent revision to the parking standards table, and the trouble to the Fire Department caused by underparked developments, disapproval of this M.O.S is recommended.

Design Modifications

The applicant is requesting a design modification to section 5.3.5(3)(b)(ii), which states that the maximum length of any attached residential building shall be 200 feet. They are requesting a maximum length of 215 feet. The conceptual elevations show an acceptable level of architectural detailing and façade variation, and therefore Planning recommends approval of this design modification.

Recommendation

..recommendation

Disapproval.

..end

See attached pages for a list of staff recommended conditions of approval.

PROCEDURAL REQUIREMENTS:

1. If the plan receives BOMA approval, the applicant shall upload the corrected plan to the online plan review website (https://franklin.contractorsplanroom.com/secure/). All revisions to the approved plans shall be "clouded." With the resubmittal, each condition of approval/open issue in the online plan review system shall contain a full response from the applicant as to the satisfaction or completion of that condition.
2. The city's project identification number shall be included on all correspondence with any city department relative to this project.

COF no: 6086

CONDITIONS OF APPROVAL:

Engineering - 2015 Site Plan Checklist

General Comments

1. C3.0 - Overall Grading & Drainage Plan

- The grading plan has changed since the previous submittal. These issues must be addressed. A sewer manhole is indicated at the southern property corner of the northern section. A storm drainage headwall and pipe are in close proximity of the manhole. The headwall must be located outside of any sewer easement. Provide the discharge point and the swale or grassy area for the swimming pool discharge. Swimming pool backwash is not permitted to flow into the sewer system or any bioretention or stormwater quality area. Provide the capacity of the downstream stormwater pipes and structures.

Engineering - PUD Plan Checklist

General Comments

2. F. Development Plan

- The engineering department told the applicant at the original pre-application meeting that they should evaluate the proposed development and subdivisions of these parcels together and not separately. During the first round of review it was our understanding that access to undeveloped commercial property would be provided through a cross access easement associated with this PUD. After discussing this in detail we need to provide some additional clarity to this issue. Below is a new comment resulting from internal discussions.

Access to a corner lot fronting on an arterial street, and bordered by a collector or local street shall be required to have access **only from the collector** or local street. The engineering department is recommending disapproval of this PUD plan until we determine how the access will be provided from the collector roadway. On Collector streets, no driveway shall be established within two-hundred and thirty (230) feet of an intersecting street. The proposed undeveloped commercial property does not have 230 feet of frontage. The proposed undeveloped commercial property needs to have a commercial access to Oak Meadow Drive for engineering to support this subdivision. A cross access easement that goes directly in front of the Amenity & Leasing Center is not adequate to support the future undeveloped commercial property.

The Existing median cut on S Royal Oaks Blvd was measured at approximately 450’ from the radius return of Oak Meadow Drive. South Royal Oaks is one of 4 streets that provides East / West Connection from I-65 to Mack Hatcher Parkway. Access along this roadway should be limited and controlled. Access to South Royal Oaks was not evaluated as part of the traffic impact study. The applicant shall change the lot lines and provide the necessary roadway frontage along Oak Meadow Drive to allow for a commercial property. The shared access shall be designed to handle the existing/proposed use (commercial/office).

Engineering is recommending disapproval of the proposed PUD.

3. I. Utility Plan

-

The reply to the previous issue "Clearly label locations of any trash compactors on the utility plan. Trash compactors must be covered and connected to the sewer system with the proper separator." brings about the following issue. The sewer service line that serves the maintenance building must be a separate service line from the line that serves the compactor. Sewer service lines must serve one building only. An 8" sewer line must be extended to the end service line.

Engineering - Site Plan Checklist

General Comments

4. E. Roadway Design and Plan & Profile

- Sight triangles will be re-evaluated at site plan submittal and must be shown on the landscape plans.

5. I. Grading Plan

- The previous comment "Applicant shall provide existing and proposed site topography with clear contour labels. Post-development contours must tie to existing within limits of disturbance. Aerial topography shall not be used as the basis of design for site work or to establish existing elevations for construction purposes." was not completely addressed. Provide labeling on the existing contours. Show how stormwater will flow from the site adjacent to Oak Meadows Drive and be intercepted so it will not flow onto the street. The survey information is not complete. There and existing drainage structures with no connecting pipes. Grading onto the Oak Meadows Drive right-of-way is not permitted for the embankment below the building.

6. I. Grading Plan

- The previous comment "Applicant shall provide top and bottom retaining wall elevations at critical locations on grading plan. The height of the retaining wall must meet City of Franklin Standards." was not completely addressed. The placement of the wall indicates grading to be placed in the Oak Meadow Drive right-of-way which is not permitted. A sidewalk must be installed along the entire development adjacent to Oak Meadow Drive. Detention pond calculations are not required for the development plan but the space provided for detention indicates it will not provide the required volume. There will also be areas required to meet water quality and infiltration requirements which have not been considered in the design.

7. Access

-

The previous comment "Provide a profile of the steep entrance ramp and show that vehicles are able to enter and exit the ramp to the north and the south." was not completely addressed. Provide a profile of the existing access drive located on the western boundary of the northern portion of the site. Continue the profile onto the drive to the northern apartment units. Show that emergency equipment can travel downhill on the joint access drive make the turn and continue uphill on the access drive to that apartments. Make it clear that the equipment will not roll over or damage the equipment in anyway. Also show that the emergency equipment can travel down the access drive from the apartments and continue up the hill on the joint access drive.

Fire-Planning

General Comments

8. Access

- The applicant has not fully addressed the previous review comment concerning drive aisle length measurements not to exceed 150 without a code-compliant turn-around (International Fire Code).

The drive aisle at the Amenity/Leasing Center is approximately 265 feet from centerline of the main roadway to the end of the drive aisle without an acceptable turn-around.

The dead-end drive aisle extending to the front of the 25-unit building at the eastern edge of the South Site measures at 160 feet from the center line of the main roadway.

The applicant shall ensure no dead-end drive aisle exists over 150 feet without an acceptable turn-around in accordance with the International Fire Code.

9. Fire Protection

- The flow test result provided has a test date of April 30, 2016.

The development plan package was accepted for review on April 8, 2016. The review occurred on April 13, 2016.

The applicant shall provide clarification on the fire demand flow test date because, as submitted, the test occurred 22 calendar days after the documents were submitted for review

Planning

2016-03-14 The Epoch Development PUD Plans.pdf

10. Cover sheet

- The applicant shall add sheet numbers to all architectural elevation sheets.

11. Site Plan/Site Layout page

- The applicant shall show the 30' utility easement on the site layout sheet, in the same location as identified on the Watson Glen Subdivision, Section 1, Revision 17

12. Open Space

- The applicant will be required to revise the site plan to provide for the required formal open space (1.52 acres); the current plan is deficient the required formal open space, because amenity centers and pools cannot be used for formal open spaces.

13. Site Plan/Site Layout page

- The applicant shall revise the plan to remove the "raceway" drive aisle that parallels the highway. At over 800' of uninterrupted drive lane with no design elements included to slow a driver down, this situation will create a speedway through the development. It is also an undesirable design, as there is nothing--building, open space, or site feature--at the end of the drive aisle to act as a terminus.

Planning (Landscape)

General Comments

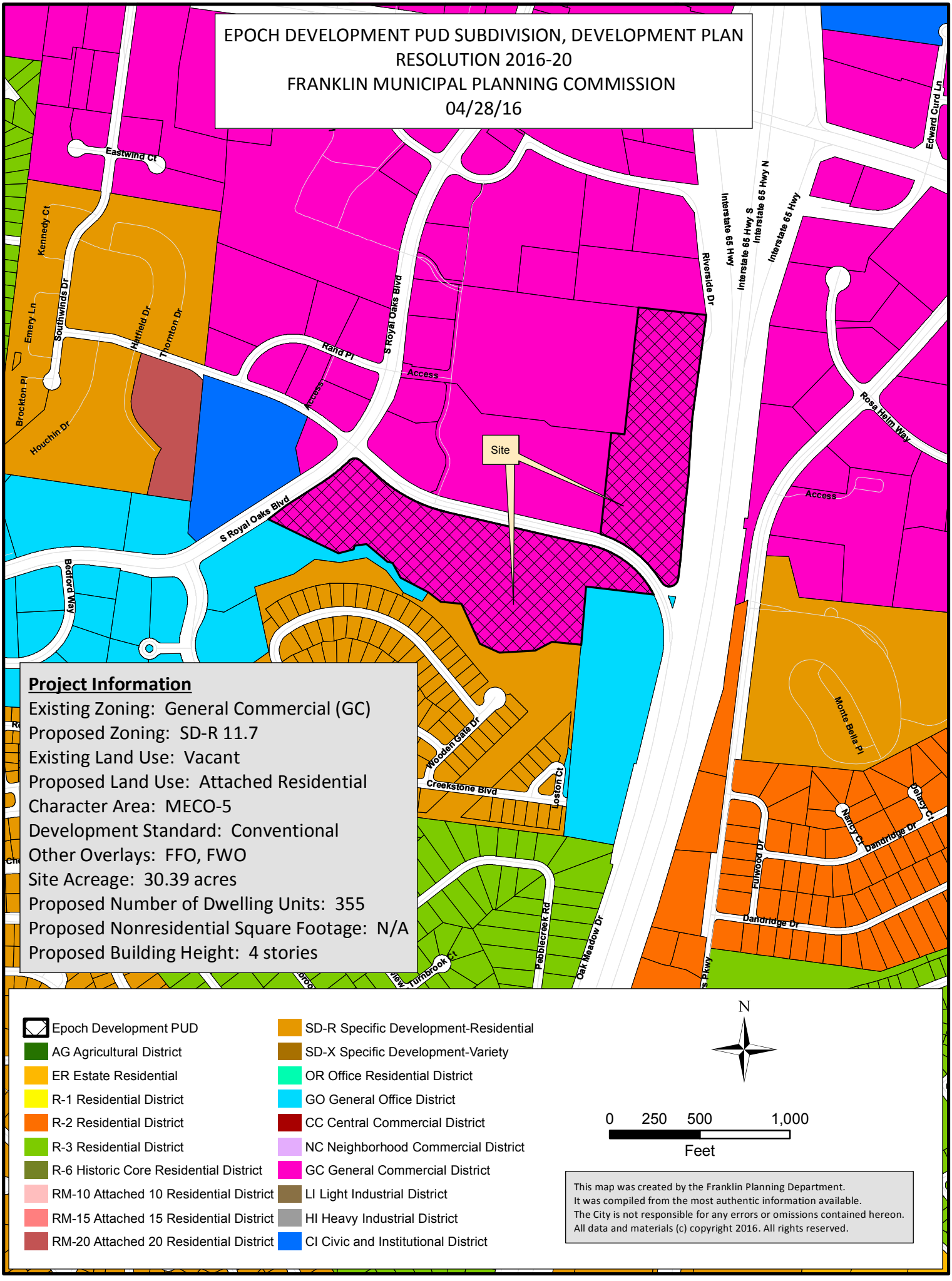
14. Parking lot street along I-65

- This is a condition to break this up!

15. Site Plan

- If the applicant had met with the staff as requested instead of just adjusting some of the site all of the issues with site could have been resolved.

All concerns and conditions remain unresolved.


EPOCH DEVELOPMENT PUD SUBDIVISION, DEVELOPMENT PLAN
RESOLUTION 2016-20
FRANKLIN MUNICIPAL PLANNING COMMISSION
04/28/16
Eastwind Ct
Kennedy Ct
Emery Ln
Southwinds Dr
Hatfield Dr
Thornton Dr
Brockton Pl
Houchin Dr
Rand Pl
S Royal Oaks Blvd
Access
Access
Site
Riverside Dr
Interstate 65 Hwy
Interstate 65 Hwy S
Interstate 65 Hwy N
Interstate 65 Hwy
Edward Curd Ln
Rosa Helm Way
Access
S Royal Oaks Blvd
Bedford Way
Wooden Gate Dr
Creekstone Blvd
Loston Ct
Monte Bella Pl
Delacy Ct
Nancy Ct
Dandridge Dr
Fullwood Dr
Dandridge Dr
Pebblecreek Rd
Oak Meadow Dr
Turnbrook Ct
Project Information
Existing Zoning: General Commercial (GC)
Proposed Zoning: SD-R 11.7
Existing Land Use: Vacant
Proposed Land Use: Attached Residential
Character Area: MECO-5
Development Standard: Conventional
Other Overlays: FFO, FWO
Site Acreage: 30.39 acres
Proposed Number of Dwelling Units: 355
Proposed Nonresidential Square Footage: N/A
Proposed Building Height: 4 stories
Epoch Development PUD
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0 250 500 1,000
Feet
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It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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RESOLUTION 2016-20

TO BE ENTITLED: "A RESOLUTION APPROVING A DEVELOPMENT PLAN FOR EPOCH DEVELOPMENT PUD SUBDIVISION WITH 1 MODIFICATIONS OF DEVELOPMENT STANDARDS (PARKING REDUCTION), FOR THE PROPERTY LOCATED WEST OF INTERSTATE 65, AT 840 AND 880 OAK MEADOW DRIVE."

WHEREAS, the Board of Mayor and Alderman (BOMA) of the City of Franklin, Tennessee, has, or will, approve the zoning for the property as part of Ordinance 2016-008; and

WHEREAS, the Planned Unit Development (PUD) process is a review procedure that is intended to encourage innovative land planning and design and avoid the monotony sometimes associated with large developments by:

(a) Reducing or eliminating the inflexibility that sometimes results from strict application of zoning standards that were designed primarily for individual lots;

(b) Allowing greater freedom in selecting the means to provide access, light, open space, and design amenities;

(c) Encouraging a sensitive design that respects the surrounding established land use character and natural or man-made features of the site including, but not limited to, trees, historic features, streams, hillsides, and floodplains;

(d) Promoting quality design and environmentally sensitive development by allowing development to take advantage of special site characteristics, locations, and land uses; and

(e) Allowing deviations from certain zoning standards that would otherwise apply if not contrary to the general spirit and intent of this ordinance; and

WHEREAS, the PUD process requires the approval of a Development Plan that is reviewed and approved by BOMA, after a public hearing and a recommendation by the Franklin Municipal Planning Commission.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF MAYOR AND ALDERMAN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That the legal description of the property included in the Development Plan is as follows:

PREMISES CONSIDERED

Map-Parcel	Acres
79-88 (portion of)	13.06
79.101.19	17.33
Total	30.39

LOT 24
MAP 79, PORTION OF PARCEL 88.00
SURVEY TRACT 1

A TRACT OF LAND IN THE NINTH CIVIL DISTRICT OF WILLIAMSON COUNTY, CITY OF FRANKLIN, TENNESSEE AND BEING GENERALLY BOUNDED ON THE NORTH BY OAK MEADOW DRIVE, (RIGHT-OF-WAY WIDTH VARIES), ON THE EAST BY NASHVILLE LODGE NO. 72, B.P.O. ELKS,

Law Dept. approved 04.18.16

RECORDED IN DEED BOOK 1708, PAGE 12, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE (R.O.W.C.,T.) ON THE SOUTH BY OPEN SPACE LOT 808 AS SHOWN ON THE PLAN ENTITLED "CREEKSTONE COMMONS, P.U.D SUBDIVISION, SECTION FOUR" OF RECORD IN PLAT BOOK P58, PAGE 10, R.O.W.C.,T. AND LOT 27 AS SHOWN ON THE PLAN ENTITLED "CREEKSTONE COMMONS, REVISION FOUR" OF RECORD IN PLAT BOOK P49, PAGE 110, R.O.W.C.,T. AND ON THE WEST BY THE REMAINDER OF LOT 24 OF FINAL PLAN OF WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, OF RECORD IN PLAT BOOK 29, PAGE 139, R.O.W.C.T AND BEING DESCRIBED ACCORDING TO A SURVEY DATED OCTOBER 15, 2015 AND PREPARED BY KEVIN L. BIRDWELL, R.L.S. NO. 1797 WHOSE ADDRESS IS RAGAN SMITH ASSOCIATES, 315 WOODLAND STREET, NASHVILLE, TN 37206 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING IN THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND BEING THE SOUTH END OF A CURVE AT THE INTERSECTION OF THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND PROCEEDING AS FOLLOWS:

THENCE, WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 72.76 FEET, A CENTRAL ANGLE OF 83 DEGREES 22 MINUTES 19 SECONDS, AND A CHORD BEARING AND DISTANCE OF NORTH 89 DEGREES 31 MINUTES 21 SECONDS EAST, 66.50 FEET TO AN IRON ROD (NEW) WITH CAP STAMPED (RSA) IN THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE;

THENCE, WITH THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE THE FOLLOWING TWO CALLS:

1. SOUTH 48 DEGREES 47 MINUTES 29 SECONDS EAST, 121.81 FEET;
2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 820.00 FEET, AN ARC LENGTH OF 71.61 FEET, A CENTRAL ANGLE OF 05 DEGREES 00 MINUTES 12 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 51 DEGREES 17 MINUTES 35 SECONDS EAST, 71.58 FEET TO AN IRON ROD (NEW) WITH CAP STAMPED (RSA), THE **POINT OF BEGINNING** OF THE HEREIN DESCRIBED TRACT OF LAND AND PROCEEEDING AS FOLLOWS:

THENCE, WITH SAID SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE THE FOLLOWING THREE CALLS:

1. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 820.00 FEET, AN ARC LENGTH OF 330.94 FEET, A CENTRAL ANGLE OF 23 DEGREES 07 MINUTES 24 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 65 DEGREES 21 MINUTES 21 SECONDS EAST, 328.69 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. SOUTH 76 DEGREES 55 MINUTES 03 SECONDS EAST, 834.46 FEET TO AN IRON ROD (NEW)WITH CAP STAMPED (RSA);
3. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 537.96 FEET, AN ARC LENGTH OF 464.57 FEET, A CENTRAL ANGLE OF 49 DEGREES 28 MINUTES 46 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 52 DEGREES 10 MINUTES 40 SECONDS EAST, 450.27 FEET TO AN IRON ROD (NEW)WITH CAP STAMPED (RSA);

THENCE, LEAVING THE SOUTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND WITH THE NORTH LINE OF THE NASHVILLE LODGE NO. 72, B.P.O. ELKS PROPERTY, NORTH 83 DEGREES 59 MINUTES 15 SECONDS WEST, 376.29 FEET TO A 1/2 INCH DIAMETER IRON ROD (OLD),

THENCE, WITH THE WEST LINE OF THE NASHVILLE LODGE NO. 72, B.P.O. ELKS PROPERTY, SOUTH 05 DEGREES 14 MINUTES 00 SECONDS WEST, PASSING A WITNESS IRON ROD (NEW) ON THE NORTH SIDE OF WATSON BRANCH AT A DISTANCE OF 298.26 AND A TOTAL DISTANCE OF 323.26 FEET TO A POINT IN THE CENTER OF WATSON BRANCH, SAID POINT BEING THE NORTHEAST CORNER OF LOT 808 ON SAID PLAN OF CREEKSTONE COMMONS P.U.D. SUDIVISION, SECTION FOUR;

THENCE, WITH THE CENTERLINE OF WATSON BRANCH AND THE NORTH LINE OF LOT 808 OF SAID CREEKSTONE COMMONS P.U.D. SUBDIVISION, SECTION FOUR AND THE NORTH LINE OF LOT 27 ON SAID PLAN OF CREEKSTONE COMMONS SUBDIVISION, REVISION 4 THE FOLLOWING SIXTEEN BEARINGS AND DISTANCES:

1. NORTH 83 DEGREES 48 MINUTES 10 SECONDS WEST, 161.22 FEET;
2. SOUTH 61 DEGREES 46 MINUTES 08 SECONDS WEST, 106.65 FEET;
3. SOUTH 86 DEGREES 48 MINUTES 30 SECONDS WEST, 198.12 FEET;

4. NORTH 65 DEGREES 28 MINUTES 52 SECONDS WEST, 120.02 FEET;
5. NORTH 24 DEGREES 43 MINUTES 04 SECONDS WEST, 244.21 FEET;
6. NORTH 84 DEGREES 36 MINUTES 00 SECONDS WEST, 115.35 FEET;
7. NORTH 52 DEGREES 04 MINUTES 01 SECONDS WEST, 87.70 FEET;
8. NORTH 57 DEGREES 18 MINUTES 12 SECONDS WEST, 163.19 FEET;
9. NORTH 29 DEGREES 52 MINUTES 55 SECONDS WEST, 101.80 FEET;
10. NORTH 74 DEGREES 02 MINUTES 09 SECONDS WEST, 41.15 FEET;
11. NORTH 48 DEGREES 56 MINUTES 27 SECONDS WEST, 137.25 FEET;
12. SOUTH 88 DEGREES 57 MINUTES 25 SECONDS WEST, 67.60 FEET,
13. SOUTH 10 DEGREES 32 MINUTES 54 SECONDS WEST, 26.12 FEET,
14. SOUTH 74 DEGREES 19 MINUTES 35 SECONDS WEST, 89.75 FEET,
15. NORTH 75 DEGREES 22 MINUTES 06 SECONDS WEST, 55.08 FEET,
16. NORTH 62 DEGREES 35 MINUTES 03 SECONDS WEST, 10.27 FEET,

THENCE, LEAVING WATSON BRANCH WITH A THE CENTERLINE OF A DRAINAGE DITCH AND SEVERING SAID LOT 24 OF FINAL PLAN OF WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, THE FOLLOWING SEVEN BEARINGS AND DISTANCES:

1. NORTH 39 DEGREES 40 MINUTES 55 SECONDS EAST, 27.30 FEET,
2. SOUTH 89 DEGREES 07 MINUTES 57 SECONDS EAST, 31.47 FEET,
3. NORTH 25 DEGREES 32 MINUTES 12 SECONDS EAST, 70.78 FEET,
4. NORTH 10 DEGREES 00 MINUTES 40 SECONDS WEST, 49.37 FEET,
5. NORTH 54 DEGREES 59 MINUTES 41 SECONDS EAST, 103.02 FEET,
6. NORTH 40 DEGREES 36 MINUTES 36 SECONDS EAST, 74.71 FEET,
7. NORTH 53 DEGREES 28 MINUTES 05 SECONDS EAST, 164.68 FEET TO THE POINT OF BEGINNING AND CONTAINING 754,942 SQUARE FEET OR 17.33 ACRES, MORE OR LESS.

and

LOT 32
MAP 79, PARCEL 101.00

A TRACT OF LAND IN THE NINTH CIVIL DISTRICT OF WILLIAMSON COUNTY, CITY OF FRANKLIN, TENNESSEE, AND BEING LOT 32 AS SHOWN ON THE FINAL PLAT ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2, REVISION 1, RESUBDIVISION OF LOT 31” OF RECORD IN PLAT BOOK P62, PAGE 45, REGISTER'S OFFICE FOR WILLIAMSON COUNTY TENNESSEE (R.O.W.C.T.). AND BEING GENERALLY BOUNDED ON THE NORTH BY LOT 10 AS SHOWN ON PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2” OF RECORD IN PLAT BOOK 13, PAGE 85, R.O.W.C.T., ON THE EAST BY RIVERSIDE DRIVE (IMPROVED AND UNIMPROVED ROAD, RIGHT-OF-WAY WIDTH VARIES), ON THE SOUTH BY OAK MEADOW DRIVE (RIGHT-OF-WAY WITH VARIES), AND ON THE WEST BY LOT 2 AS SHOWN ON THE PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, (RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11) OF RECORD IN PLAT BOOK 29, PAGE 139, R.O.W.C.T. AND LOT 31 ON SAID PLAN ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2, REVISION 1, RESUBDIVISION OF LOT 31” OF RECORD IN PLAT BOOK P62, PAGE 45, R.OW.C.T., AND BEING DESCRIBED ACCORDING TO A SURVEY DATED OCTOBER 15, 2015 AND PREPARED BY KEVIN L BIRDWELL, R.L.S. NO. 1797 WHOSE ADDRESS IS RAGAN SMITH ASSOCIATES, 315 WOODLAND STREET, NASHVILLE, TN 37206 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT AN IRON ROD (OLD) WITH CAP STAMPED “RAGAN-SMITH ASSOCIATES” (RSA), SAID PIN BEING IN THE EASTERLY RIGHT-OF-WAY OF SOUTH ROYAL OAKS BOULEVARD AND BEING THE NORTH END OF A CURVE AT THE INTERSECTION OF THE EAST RIGHT-OF-WAY LINE OF SOUTH ROYAL OAKS BOULEVARD AND THE NORTH RIGHT-OF-WAY LINE OF OAK MEADOW DRIVE AND BEING A WESTERLY CORNER OF LOT 30 OF THE FINAL PLAT ENTITLED “WATSON GLEN SUBDIVISION, SECTION 2 OF RECORD IN PLAT BOOK P43, PAGE 40, R.O.W.C.T.;

THENCE, WITH A CURVE TO THE LEFT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 73.83 FEET, A CENTRAL ANGLE OF 84 DEGREES 35 MINUTES 53 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 06 DEGREES 29 MINUTES 38 SECONDS EAST, 67.30 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA) IN THE NORTHERLY RIGHT-OF-WAY OF OAK MEADOW DRIVE (RIGHT-OF-WAY WIDTH VARIES);

THENCE, CONTINUING WITH SAID RIGHT-OF-WAY AND WITH THE SOUTHERLY LINE OF SAID LOT 30 THE FOLLOWING TWO CALLS:

1. SOUTH 48 DEGREES 47 MINUTES 29 SECONDS EAST, 157.42 FEET IRON ROD (OLD) WITH CAP STAMPED (RSA);

2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 750.00 FEET, AN ARC LENGTH OF 251.97 FEET, A CENTRAL ANGLE OF 19 DEGREES 14 MINUTES 55 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 58 DEGREES 24 MINUTES 57 SECONDS EAST, 250.78 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA) AT THE SOUTHWEST CORNER OF LOT 31 ON THE PLAN ENTITLED "WATSON GLEN SUBDIVISION, SECTION 2, REVISON 1, RESUBDIVISION OF LOT 31" OF RECORD IN PLAT BOOK P62, PAGE 45, R.O.W.C.T.;
THENCE, CONTINUING WITH SAID RIGHT-OF-WAY AND WITH THE SOUTHERLY LINE OF SAID LOT 31 THE FOLLOWING THREE CALLS:
1. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 750.00 FEET, AN ARC LENGTH OF 116.20 FEET, A CENTRAL ANGLE OF 08 DEGREES 52 MINUTES 38 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 72 DEGREES 28 MINUTES 44 SECONDS EAST, 116.09 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. SOUTH 76 DEGREES 55 MINUTES 03 SECONDS EAST, 811.13 FEET TO AN IRON ROD (OLD);
3. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 607.96 FEET, AN ARC LENGTH OF 43.08 FEET, A CENTRAL ANGLE OF 04 DEGREES 03 MINUTES 37 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 74 DEGREES 53 MINUTES 15 SECONDS EAST, 43.07 FEET TO A PK NAIL (OLD) IN THE CENTERLINE OF AN ACCESS DRIVE, THE **POINT OF BEGINNING** OF THE HEREIN DESCRIBED TRACT OF LAND AND PROCEEEDING AS FOLLOWS:
4. THENCE, LEAVING SAID RIGHT-OF-WAY OF OAK MEADOW DRIVE WITH THE CENTERLINE OF SAID ACCESS DRIVE AND THE EAST LINE OF SAID LOT 31 ON THE PLAN ENTITLED "WATSON GLEN SUBDIVISION, SECTION 2, REVISON 1, RESUBDIVISION OF LOT 31" OF RECORD IN PLAT BOOK P62, PAGE 45, R.O.W.C.T.;NORTH 06 DEGREES 14 MINUTES 29 SECONDS EAST, 564.50 FEET TO A PK NAIL (OLD) IN THE SOUTH LINE OF LOT 2 AS SHOWN ON THE PLAN ENTITLED "WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, (RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11);
THENCE, WITH THE SOUTH AND EAST LINE OF SAID LOT 2, THE FOLLOWING TWO BEARINGS AND DISTANCES:
1. SOUTH 83 DEGREES 35 MINUTES 44 SECONDS EAST, 73.68 FEET TO AN IRON ROD (OLD) WITH CAP STAMPED (RSA);
2. NORTH 06 DEGREES 24 MINUTES 16 SECONDS EAST, 708.89 FEET TO PUNCH HOLE IN A LIGHT BASE IN THE SOUTH LINE OF SAID LOT 10 OF FINAL PLAT ENTITLED "WATSON GLEN SUBDIVISION, SECTION 2";
THENCE, WITH THE SOUTH LINE OF SAID LOT 10, SOUTH 83 DEGREES 32 MINUTES 35 SECONDS EAST, 377.77 FEET TO CONCRETE MONUMENT OLD IN THE WESTERLY RIGHT-OF-WAY OF RIVERSIDE DRIVE (RIGHT-OF-WAY WIDTH VARIES);
THENCE, WITH THE WESTERLY RIGHT-OF-WAY OF RIVERSIDE DRIVE (IMPROVED AND UNIMPROVED ROAD), THE FOLLOWING FOUR CALLS:
1. SOUTH 07 DEGREES 40 MINUTES 29 SECONDS WEST, 577.88 FEET TO AN IRON ROD (OLD);
2. SOUTH 04 DEGREES 01 MINUTES 39 SECONDS WEST, 310.67 FEET TO AN IRON ROD (OLD);
3. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 11300.00 FEET, AN ARC LENGTH OF 470.04 FEET, A CENTRAL ANGLE OF 02 DEGREES 23 MINUTES 00 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 05 DEGREES 13 MINUTES 09 SECONDS WEST, 470.01 FEET TO A CONCRETE MONUMENT (OLD);
4. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 11300.00 FEET, AN ARC LENGTH OF 112.73 FEET, A CENTRAL ANGLE OF 00 DEGREES 34 MINUTES 18 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 06 DEGREES 41 MINUTES 48 SECONDS WEST, 112.73 FEET TO A CONCRETE MONUMENT (OLD);
THENCE, LEAVING SAID RIGHT-OF-WAY OF RIVERSIDE DRIVE AND WITH THE NORTH RIGHT-OF-WAY OF OAK MEADOW DRIVE (RIGHT-OF-WAY WIDTH VARIES) THE FOLLOWING TWO CALLS:
1. WITH A CURVE TO THE RIGHT HAVING A RADIUS OF 50.00 FEET, AN ARC LENGTH OF 123.89 FEET, A CENTRAL ANGLE OF 141 DEGREES 58 MINUTES 19 SECONDS, AND A CHORD BEARING AND DISTANCE OF SOUTH 77 DEGREES 58 MINUTES 06 SECONDS WEST, 94.54 FEET TO AN IRON ROD (OLD);
2. WITH A CURVE TO THE LEFT HAVING A RADIUS OF 607.96 FEET, AN ARC LENGTH OF 443.66 FEET, A CENTRAL ANGLE OF 41 DEGREES 48 MINUTES 42 SECONDS, AND A CHORD BEARING AND DISTANCE OF NORTH 51 DEGREES 57 MINUTES 06 SECONDS WEST, 433.88 FEET TO THE **POINT OF BEGINNING** AND CONTAINING 569,021 SQUARE FEET OR 13.06 ACRES, MORE OR LESS.

SECTION II: That the attached Location Map and Development Plan shall serve the purpose of further delimiting the geographical boundaries as described by this Resolution.

SECTION III: That the overall entitlements for the Epoch Development PUD Subdivision are as follows:

Entitlements	Epoch Development
Base Zone District	SD-R 12.0
Character Area Overlay	MECO-5
Other Zoning Overlays	FFO, FWO
Development Standard	Conventional
Number of Dwelling Units	355
Number of Nonresidential Square Footage	0
Number of Hotel Rooms	0
Connectivity Index	n/a
Open Space Requirements	4.56 acres
Number of Phases in Development	1

SECTION IV: That the Development Plan, the exhibits accompanying the Development Plan, and all conditions and restrictions placed upon the Development Plan by the Franklin Municipal Planning Commission and this Board shall be made a part of this Resolution as though copied verbatim herein, and that a permanent record of the Development Plan, the exhibits accompanying the Development Plan, and all such conditions and restrictions shall be kept in the Franklin Planning and Sustainability Department.

SECTION V: That the following Modifications of Development Standards (MOS) were requested and acted upon by the Board of Mayor and Alderman, after review and recommendation by the Franklin Municipal Planning Commission:

MOS 1: **Parking Reduction** Approved: _____ Denied: _____	Request to reduce the parking requirement to 1.75 spaces per unit. *Staff recommended disapproval.*

SECTION VI. That this Resolution shall take effect from and after its passage on its first and final reading, the health, safety, and welfare of the citizens requiring it.

_____ _____

ERIC S. STUCKEY **DR. KEN MOORE**
City Administrator Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

PREAPPLICATION CONFERENCE: _____02/04/16_____

BOMA/FMPC JOINT CONCEPTUAL WORKSHOP: _____02/25/16_____

NEIGHBORHOOD MEETING: _____03/02/16_____

PLANNING COMMISSION RECOMMENDED APPROVAL: _____

PUBLIC HEARING AND BOMA APPROVAL: _____

Law Dept. approved 04.18.16

SITE DATA

PROJECT NAME	OAK MEADOWS EPOCH DEVELOPMENT REZONING & PUD APPLICATION
PROJECT NUMBER:	TBD
LOTS:	2 EXISTING, 3 PROPOSED
ADDRESS:	840 & 880 OAK MEADOWS DR.
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH
MAP, GROUP AND PARCEL NUMBERS:	MAP 79, PARCELS 88.00 (PORTION OF) & 101.19
EXISTING ZONING:	GC (GENERAL COMMERCIAL)
PROPOSED ZONING:	SD-R (12) (SPECIFIC DEVELOPMENT RESIDENTIAL 12 UNITS/AC)
CHARACTER AREA OVERLAY:	MECO-5
OTHER APPLICABLE OVERLAYS:	FFO & FWO
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	13.06 + 17.33 = 30.39 ACRES
SQUARE FOOTAGE OF SITE:	569,021 + 754,942 = 1,323,963 SQUARE FEET
MINIMUM REQUIRED SETBACK LINES:	ATTACHED RESIDENTIAL USE
YARD FRONTING COLLECTOR (OAK MEADOWS)	40'
SIDE YARD	15'
REAR YARD	30'
OWNER (BOTH PARCELS):	E. WARNER BASS, TRUSTEE
ADDRESS:	150 3RD AVE. SOUTH, SUITE 2800, NASHVILLE, TN 37201
PHONE NO.:	615.742.6400
E-MAIL ADDRESS:	wbass@bassberry.com
CONTACT NAME:	MR. WARNER BASS
MINERAL RIGHTS:	CONTROLLED BY CURRENT PROPERTY OWNER
APPLICANT:	CRUNK ENGINEERING LLC
ADDRESS:	1894 GEN. GEORGE PATTON DR., SUITE 600 FRANKLIN, TN 37067
PHONE NO.:	615.873.1795
E-MAIL ADDRESS:	adam@crunkeng.com
CONTACT NAME:	MR. ADAM CRUNK, P.E.

DENSITY

ATTACHED DWELLING UNITS	355 UNITS
LAND AREA	30.39 ACRES
LAND AREA WITHIN FLOODPLAIN OVERLAY	8.32 ACRES
OVERALL DENSITY	11.7 UNITS/ACRE
NET DENSITY (MINUS OVERLAY CONSTRAINT)	16.1 UNITS/ACRE

BUILDING HEIGHT

ALLOWABLE	6 STORIES MAXIMUM
PROPOSED	NORTH PARCEL - 4 STORIES SOUTH PARCEL 2/3 STORIES (2 STORY FACING STREET)

PROPOSED LANDSCAPE SURFACE RATIO:	NORTH SITE - 0.42; SOUTH SITE - 0.56; COMBINED - 0.50
MINIMUM LANDSCAPE SURFACE RATIO:	0.20

PARKING

EXISTING 0

REQUIRED (1.5/1BR + 2.5/2BR + 3/3BR)

NORTH SITE	SOUTH SITE
1BR - 104 UNITS * 1.5 = 156 SPACES	1BR - 45 UNITS * 1.5 = 68 SPACES
2BR - 112 UNITS * 2.5 = 280 SPACES	2BR - 50 UNITS * 2.5 = 125 SPACES
3BR - 24 UNITS * 3.0 = 72 SPACES	3BR - 20 UNITS * 3.0 = 60 SPACES
TOTAL REQUIRED = 508 SPACES INCLUDING 9 ADA SPACES	TOTAL REQUIRED = 253 SPACES INCLUDING 7 ADA SPACES

MAXIMUM PARKING: NORTH SITE - 610 SPACES; SOUTH SITE - 304 SPACES

*MODIFICATION OF STANDARD REQUEST TO REDUCE PARKING REQUIREMENT TO 1.75 PER UNIT
NORTH SITE = 240 X 1.75 = 420 SPACES
SOUTH SITE = 115 X 1.75 = 202 SPACES

PROPOSED

NORTH SITE		SOUTH SITE (APTS. ONLY)	
REGULAR SPACES	329	REGULAR SPACES	198
COMPACT SPACES (22 % OF TOTAL)	84	COMPACT SPACES (8 % OF TOTAL)	19
ADA SPACES	16	ADA SPACES	8
TOTAL PROVIDED	429	TOTAL PROVIDED	225
		SOUTH SITE (AMENITY CTR.)	
		REGULAR SPACES	24
		COMPACT SPACES (0% OF TOTAL)	0
		ADA SPACES	2
		TOTAL PROVIDED	26

TREE CANOPY:

EXISTING CANOPY COVERAGE	NORTH SITE - 9%	SOUTH SITE - 65%
REQUIRED PERCENTAGE TO REMAIN	NORTH SITE - 54%	SOUTH SITE - 36%
PROPOSED PERCENTAGE TO REMAIN	NORTH SITE - 54%	SOUTH SITE - 42%

PARKLAND DEDICATION: FEE IN LIEU OF FOR 5.37 ACRES, 355 TOTAL UNITS PROPOSED

OPEN SPACE:

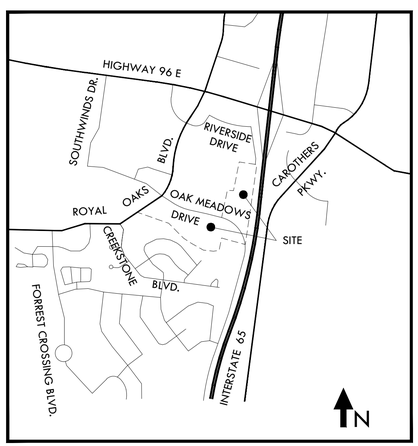
TOTAL OPEN SPACE REQ'D (15% OF 30.39 AC.)	4.56 AC.
FORMAL OPEN SPACE REQUIRED (33% OF OPEN SPACE REQUIRED)	1.52 AC.
	1.65 AC. PROVIDED
INFORMAL OPEN SPACE REQUIRED (67% OF OPEN SPACE REQUIRED)	3.04 AC.
	8.9 AC. PROVIDED

USE BUFFER: 50-FT CLASS C INCOMPATIBLE LAND USE BUFFER (SOUTH PORTION OF SOUTH SITE)
40-FT INTERSTATE BUFFER (EAST PORTION OF NORTH SITE)

NOTES:

PROPERTY IS LOCATED ON MAP 79 AS A PORTION OF LOT 88.00 AND PARCEL 101.19 CONTAINING 30.39 ACRES.

PARCEL 88.00 DOES LIE WITHIN THE 100-YEAR FLOOD PLAIN AS INDICATED BY FIRM MAP NO. 47187C0212F DATED SEPTEMBER 29, 2006.



VICINITY MAP
NO SCALE

REZONING & PUD

The Epoch Development

PUD SUBDIVISION, DEVELOPMENT PLAN

Franklin, Williamson County, Tennessee

CITY OF FRANKLIN PROJECT NO. 6086

APRIL 7 2016

PREPARED FOR:

EPOCH RESIDENTIAL

359 Carolina Avenue
Winter Park, Florida
(407) 644-9055

DESIGN MODIFICATION REQUEST:

A DESIGN MODIFICATION ALLOWING A BUILDING LENGTH OF 215 FT, AS OPPOSED TO 200 FT, IS REQUESTED BASED ON THE CRITERIA OUTLINED IN THE ZONING ORDINANCE SECTION 5.3.11 (2) AS FOLLOWS:

1. THE BUILDINGS ARE ORIENTED IN A WAY TO MINIMIZE THE VIEW-SHED IMPACT TO TRAVELERS ALONG I-65 AND OAK MEADOW DRIVE. THE BUILDINGS HAVE AN UNDULATING FACADE THAT MINIMIZES IMPACT OF THE BROAD VIEW OF THE BUILDING. IF THE DESIGN MODIFICATION WAS DISAPPROVED, THEN THE BUILDING WOULD GET LONGER IN THE OTHER DIRECTION. NO DETRIMENTAL IMPACTS ARE ANTICIPATED TO THE PUBLIC HEALTH, SAFETY, OR WELFARE.
2. THE DESIGN MODIFICATION IS BEING SOUGHT AS A SPECIFIC DESIGN TO THIS PARCEL TO UTILIZE THE SITE AS EFFICIENTLY AS POSSIBLE. THEREFORE THIS REQUEST IS SPECIFIC TO THIS PROJECT, AND IN FACT, IS NOT BEING REQUESTED ON THE SOUTHERN PARCEL.
3. THE DESIGN MODIFICATION IS NECESSARY TO MAXIMIZE THE EFFICIENCY OF THE SITE AND PROVIDE VIABLE LIVING SPACES WITHIN THE PROPOSED DWELLING UNITS.
4. THE DESIGN MODIFICATION WILL IN NO WAY VARY THE PROVISIONS OF THE LAND USE ORDINANCE AS WE BELIEVE THE REQUEST IS MINOR IN NATURE AND NOT NOTICEABLE TO THE NAKED EYE.

MODIFICATION OF STANDARDS REQUEST:

1. REDUCE PARKING REQUIREMENT TO 1.75 SPACES PER UNIT, AS JUSTIFIED BY PARKING DEMAND STUDY.

FEE IN LIEU OF REQUEST:

1. PARKLAND DEDICATION.

INDEX OF SHEETS

SHEET NO.	SHEET TITLE
C0.0	COVER SHEET
C1.0	OVERALL EXISTING CONDITIONS
C1.1	NORTH SITE EXISTING CONDITIONS
C1.2	SOUTH SITE EXISTING CONDITIONS
C2.0	OVERALL DEVELOPMENT PLAN
C2.1	NORTH SITE DEVELOPMENT PLAN
C2.2	SOUTH SITE DEVELOPMENT PLAN
C2.3	GENERAL LIGHTING PLAN
C3.0	OVERALL GRADING & DRAINAGE PLAN
C3.1	SOUTH SITE GRADING & DRAINAGE PLAN
C3.2	SOUTH & NORTH SITE GRADING & DRAINAGE PLAN
C3.3	NORTH SITE GRADING & DRAINAGE PLAN
C4.0	OVERALL ACCESS PLAN
C4.1	NORTH SITE ACCESS PLAN
C4.2	SOUTH SITE ACCESS PLAN
C5.0	OVERALL UTILITY PLAN
C5.1	NORTH SITE UTILITY PLAN
C5.2	SOUTH SITE UTILITY PLAN
A1.0	NORTH PARCEL ELEVATION
A2.0	NORTH PARCEL SIDE ELEVATION
A3.0	SOUTH PARCEL NORTH ELEVATION
A4.0	SOUTH PARCEL SOUTH ELEVATION
A5.0	AMENITY/CLUBHOUSE CENTER ELEVATION
A6.0	POOL PAVILION ELEVATION

KENNETH LINEHAN REGISTERED ARCHITECT — STATE OF TENNESSEE

ARCHITECT OF RECORD:

KENNETH LINEHAN, AIA, LEED AP
FUGLEBURG KOCH ARCHITECTS
2555 TEMPLE TRAIL
WINTER PARK, FL 32789
407-629-0595
kenl@fuglebergkoch.com

CRUNK ENGINEERING LLC
1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

ENGINEERING CRUNK

WILSON COUNTY — REGISTERED LANDSCAPE ARCHITECT — AGRICULTURE — 4/7/16 — STATE OF TENNESSEE

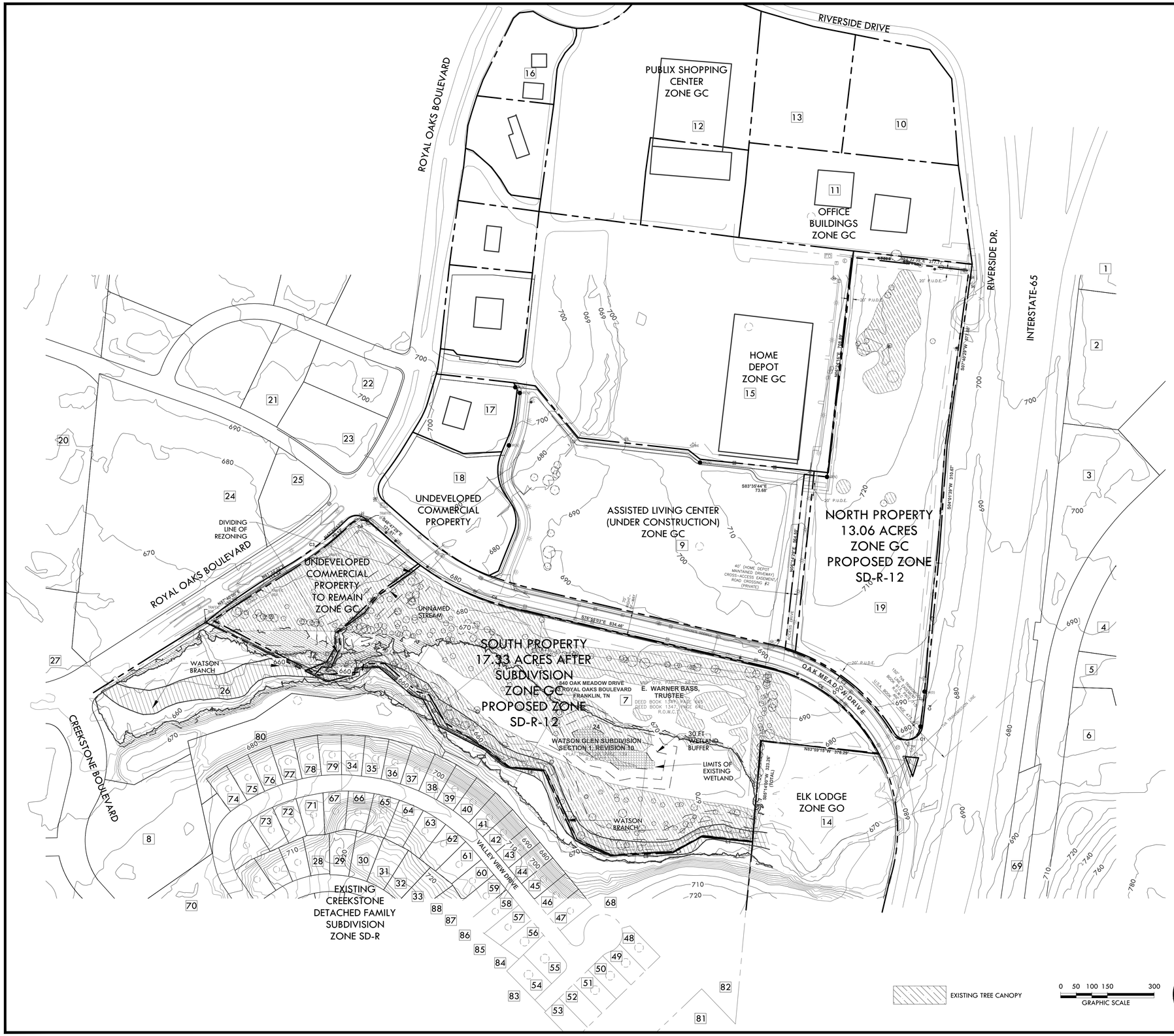
THE EPOCH DEVELOPMENT
PUD SUBDIVISION, DEVELOPMENT PLAN
COF #6086 FRANKLIN, TN

REVISIONS		
No.	DATE	

04/07/16 15001

C0.0

COVER SHEET



ID	PRCUID	DEED / PLAT	LAND USE	OWNER	ZONING
1	079---06905	DB 3844 DP 619 PB16 PP114	HOTEL	BRE/LQ PROP LLC	GC
2	079---06906	DB 2966 DP 435 PB22 PP11	AUTO DLR	ADKINS RODNEY G	GC
3	079---07600	DB 4341 DP763 PB22 PP11	CHURCH	CHURCH GATE THE	GC
4	079---08000	DB6337 DP70 PB61 PP69	REC	SOAR ADVENTURE TOWER LLC	GC
5	079---08200	DB5165 DP555	UNDEV.	NICHOLS J DONALD	SD-R
6	079---08300	DB1350 DP525	ATTACHED RESID.	UNITED DOMINION REALTY LP	GC
7	079---08800	DB1347 DP645 PB29 PP139	UNDEV.	BASS E WARNER TR	GC
8	079---10001	DB2192 DP320 PB31 PP125	DAYCARE	WOOD & WOOD LLC	GO
9	079---10100	DB6533 DP243 PB62 PP45	ASST. LVG	DOMINION SENIOR LIVING OF FRANKLIN L	GC
10	079---10101	DB5434 DP660	OFFICE	5107 LLC	GC
11	079---10102	DB2200 DP199 PB19 PP59	OFFICE	UN DON REALTY LLC	GC
12	079---10103	DB5459 DP859 PB99 PP3	RETAIL	PUBLIX TENNESSEE LLC	GC
13	079---10104	DB6168 DP806 PB22 PP120	ASST. LVG	FRANKLIN TN SENIOR CARE PROPERTY LLC	GC
14	079---10105	-	REC	NASHVILLE LODGE #72 BPO ELKS	GO
15	079---10110	DB4406 DP792 PB29 PP139	RETAIL	HD DEVELOPMENT OF MARYLAND INC	GC
16	079---10114	DB5459 DP859 PB29 PP139	RETAIL	PUBLIX TENNESSEE LLC	GC
17	079---10116	DB3792 DP29 PB29 PP139	RETAIL	FIRST-CITIZENS BANK AND TR CO	GC
18	079---10117	PB 43 PP40	UNDEV.	BASS E WARNER TR	GC
19	079---10119	PB 43 PP40	UNDEV.	BASS E WARNER TR	GC
20	079O-A01401	DB4197 DP993 PB41 PP33	UNDEV.	SWJ2 TENNESSEE LLC	RM-20
21	079O-A00300	DB4200 DP849 PB27 PP4	INSTIT.	CHURCH CORNERSTONE MINISTRIES INC	GC
22	079O-A00301	DB5790 DP107 PB29 PP10	RETAIL	MAGLI CHERYL S FAMILY TRUST	GC
23	079O-A00302	DB5871 DP528 PB26 PP10	RETAIL	LCJ LLC	GC
24	079O-A00400	DB794 DP881 PB12 PP76		UNITED STATES POSTAL SERV	CI
25	079O-A00401	DB1946 DP286 PB12 PP76	RETAIL	COMMUNITY BANK	GC
26	079O-C02500	DB5136 DP628	UNDEV.	CADENCE BANK NA	GO
27	079O-C02800	PB47 PP142	UNDEV.	ROYAL OAKS PARK SOUTH	GO
28	079O-D00100	DB5814 DP815 PB55 PP146	RESIDENTIAL	THURM DAVID M	SD-R
29	079O-D00200	DB5807 DP985 PB55 PP146	RESIDENTIAL	HAMILTON MALLORY	SD-R
30	079O-D00300	DB4624 DP480 PB55 PP146	RESIDENTIAL	LYLE JORDAN WILLIAM	SD-R
31	079O-D00400	DB5780 DP386 PB55 PP146	RESIDENTIAL	EVANGELISTA BERNARDINO JR	SD-R
32	079O-D00500	DB5841 DP984 PB55 PP146	RESIDENTIAL	CASTANEDA ORESTES	SD-R
33	079O-D00600	DB5809 DP135 PB55 PP146	RESIDENTIAL	VOSS STEPHEN M	SD-R
34	079O-E00100	DB6536 DP118 PB58 PP10	RESIDENTIAL	KHOT SOHAM	SD-R
35	079O-E00200	DB6190 DP252 PB58 PP10	RESIDENTIAL	GOOCH RYAN M	SD-R
36	079O-E00300	DB6218 DP405 PB58 PP10	RESIDENTIAL	SULLIVAN JOHN	SD-R
37	079O-E00400	DB6232 DP372 PB58 PP10	RESIDENTIAL	CULLEN ROBERT BARRY	SD-R
38	079O-E00500	DB6231 DP1 PB58 PP10	RESIDENTIAL	MILLER ROBERT FRANK	SD-R
39	079O-E00600	DB6288 DP734 PB58 PP10	RESIDENTIAL	DHARANI KHAIRUNISSA	SD-R
40	079O-E00700	DB6218 DP407 PB58 PP10	RESIDENTIAL	KNOX CONSUELA S	SD-R
41	079O-E00800	DB6229 DP797 PB58 PP10	RESIDENTIAL	DAWKINS BRETTON GUY	SD-R
42	079O-E00900	DB6296 DP854 PB58 PP10	RESIDENTIAL	COMEAUX MARGARET A	SD-R
43	079O-E01000	DB6273 DP312 PB58 PP10	RESIDENTIAL	SMITH CHRISTOPHER S	SD-R
44	079O-E01100	DB6281 DP281 PB58 PP10	RESIDENTIAL	DANIELS THOMAS	SD-R
45	079O-E01200	DB6541 DP640 PB58 PP10	RESIDENTIAL	SUNDARAM BARATH SHANMUGA	SD-R
46	079O-E01300	DB6331 DP190 PB58 PP10	RESIDENTIAL	HOSSAIN MOHAMMAD	SD-R
47	079O-E01400	DB6264 DP154 PB58 PP10	RESIDENTIAL	MAPLESDEN LAWRENCE	SD-R
48	079O-E01500	DB6346 DP779 PB58 PP10	RESIDENTIAL	BECHARD BRIAN	SD-R
49	079O-E01600	DB6029 DP837 PB58 PP10	RESIDENTIAL	VIDYAM SATHEESH	SD-R
50	079O-E01700	DB6145 DP168 PB58 PP10	RESIDENTIAL	RUSSO JOHN M	SD-R
51	079O-E01800	DB6177 DP164 PB58 PP10	RESIDENTIAL	QUIGLEY J PATRICK	SD-R
52	079O-E01900	DB6151 DP238 PB58 PP10	RESIDENTIAL	BONHAM SYDNEY	SD-R
53	079O-E02000	DB6156 DP254 PB58 PP10	RESIDENTIAL	BURGER JORDAN	SD-R
54	079O-E02100	DB6172 DP871 PB58 PP10	RESIDENTIAL	NOLAN MICHAEL S TRUST	SD-R
55	079O-E02200	DB6195 DP626 PB58 PP10	RESIDENTIAL	PARSI SREEKANTH	SD-R
56	079O-E02300	DB6029 DP771 PB58 PP10	RESIDENTIAL	KOLLI MURALL KRISHNA	SD-R
57	079O-E02400	DB6252 DP619 PB58 PP10	RESIDENTIAL	RAMAN VENKATESH	SD-R
58	079O-E02500	DB6231 DP816 PB58 PP10	RESIDENTIAL	RAJENDRAN THAMIL S	SD-R
59	079O-E02600	DB6195 DP601 PB58 PP10	RESIDENTIAL	DOPPALAPUDI SRIKANTH	SD-R
60	079O-E02700	DB6182 DP362 PB58 PP10	RESIDENTIAL	CHINTAKINDI VARUN K	SD-R
61	079O-E02800	DB6177 DP138 PB58 PP10	RESIDENTIAL	KRISHNAN JAGADEESWARAN	SD-R
62	079O-E02900	DB6152 DP63 PB58 PP10	RESIDENTIAL	MOHAMED ABDUL R J	SD-R
63	079O-E03000	DB6153 DP125 PB58 PP10	RESIDENTIAL	PICHAIMUTHU NARAYANAN	SD-R
64	079O-E03100	DB6160 DP536 PB58 PP10	RESIDENTIAL	ZELLER JAMES S JR	SD-R
65	079O-E03200	DB6583 DP472 PB58 PP10	RESIDENTIAL	MURRAY KIMBERLY	SD-R
66	079O-E03300	DB6172 DP802 PB58 PP10	RESIDENTIAL	ZIPPER NATHAN M	SD-R
67	079O-E03400	DB6154 DP157 PB58 PP10	RESIDENTIAL	VIGIL MARIO G	SD-R
68	079O-E03500	DB6104 DP222 PB58 PP10	RESIDENTIAL	CREEKSTONES HOMEOWNERS ASSOCIATION I	SD-R
69	089---02609	DB13915 DP 891 PB149 P17	RESIDENTIAL	A T & T CORP BY & THROUGH	R-2
70	089B-O04200	DB5309 DP243 PB54 PP20	RESIDENTIAL	CREEKSTONE HOMEOWNERS ASSOCIATION IN	SD-R
71	089B-O04600	DB5727 DP67 PB54 PP20	RESIDENTIAL	BLACKSHER NICOLE E	SD-R
72	089B-O04700	DB6656 DP836 PB54 PP20	RESIDENTIAL	DRUSE JONATHAN	SD-R
73	089B-O04800	DB5674 DP620 PB54 PP20	RESIDENTIAL	KUMAR RATNA	SD-R
74	089B-O05000	DB6412 DP384 PB54 PP20	RESIDENTIAL	BLANKENSHIP JON I	SD-R
75	089B-O05100	DB5710 DP738 PB54 PP20	RESIDENTIAL	BURRELL GERALD MARK	SD-R
76	089B-O05200	DB5716 DP104 PB54 PP20	RESIDENTIAL	BUCKNER RICHARD D	SD-R
77	089B-O05300	DB5604 DP513 PB54 PP20	RESIDENTIAL	LERCHE MICHAEL	SD-R
78	089B-O05400	DB6046 DP929 PB54 PP20	RESIDENTIAL	RUSSELL KAREN KINGSBURY	SD-R
79	089B-O05500	DB5747 DP463 PB54 PP20	RESIDENTIAL	THEURER DAVID S	SD-R
80	089B-O05600	DB5309 DP243 PB54 PP20	RESIDENTIAL	CREEKSTONE HOMEOWNERS ASSOCIATION IN	SD-R
81	089B-P01500	DB6057 DP780 PB56 PP76	RESIDENTIAL	BARLOW JOHN	SD-R
82	089B-P01600	DB6119 DP165 PB56 PP76	RESIDENTIAL	ERWIN DEVAN A	SD-R
83	089B-P02000	DB6031 DP735 PB56 PP76	RESIDENTIAL	PATEL NIKUNJ M	SD-R
84	089B-P02100	DB5983 DP439 PB56 PP76	RESIDENTIAL	JANI BHAVESHKUMAR	SD-R
85	089B-P02200	DB5989 DP962 PB56 PP76	RESIDENTIAL	HARRIS JOHN	SD-R
86	089B-P02300	DB6000 DP115 PB56 PP76	RESIDENTIAL	LEDGISTER KEVIN ARTHUR	SD-R
87	089B-P02400	DB6377 DP104 PB56 PP76	RESIDENTIAL	JOHANSEN MICHAEL	SD-R
88	089B-P02500	DB5899 DP690 PB56 PP76	RESIDENTIAL	COLLIER EDWARD W III	SD-R

CRUNK ENGINEERING LLC
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WWW.CRUNKENG.COM

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

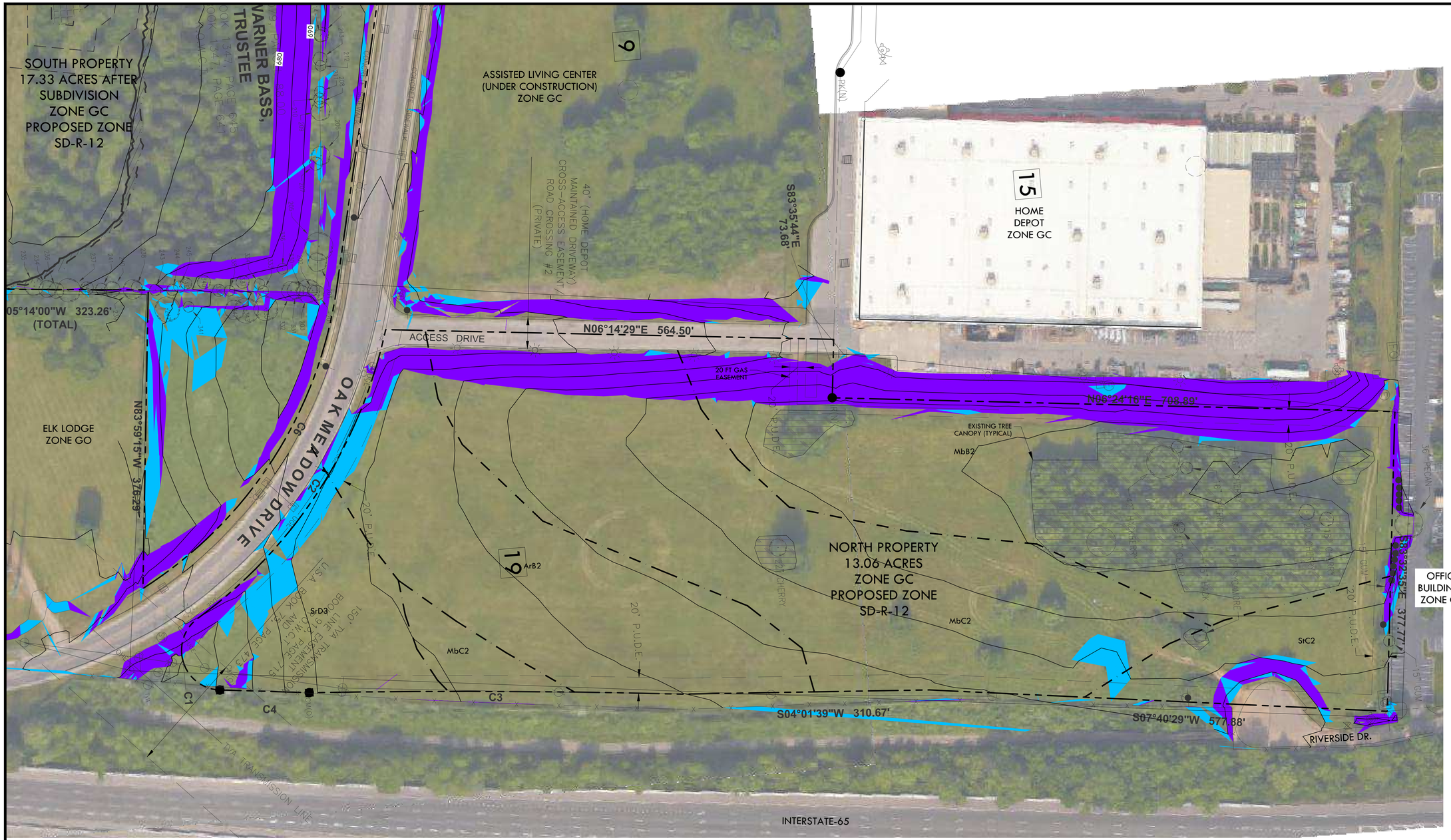
COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C1.0

OVERALL EXISTING CONDITIONS PLAN



SLOPE LEGEND

- GREATER THAN 14% AND LESS THAN 20% SLOPE
- GREATER THAN 20% SLOPE

SOIL TYPES

ArB2	Armour silt loam, 2% to 5 % slopes, eroded
CaC2	Captina silt loam, phosphatic, 5% to 12% slopes, eroded
Eg	Egam silt loam, phosphatic
Hu	Huntington silt loam, phosphatic
InE3	Inman silty clay loam, 20% to 30% slopes, severely eroded
MbB2	Maury silt loam, 2% to 5% slopes, eroded
MbC2	Maury silt loam, 5% to 12% slopes, eroded
SrC3	Stiversville clay loam, 5% to 12% slopes, eroded
SrD3	Stiversville clay loam, 12% to 20% slopes, severely eroded
StC2	Stiversville silt loam, 5% to 12% slopes, eroded

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	50.00'	123.89'	141°58'19"	145.10	94.54'	S77°58'06"W
C2	607.96'	443.66'	41°48'42"	232.23	433.88'	N51°57'06"W
C3	11300.00'	470.04'	2°23'00"	235.06	470.01'	S05°13'09"W
C4	11300.00'	112.73'	0°34'18"	56.37	112.73'	S06°41'48"W

0 30 60 120
GRAPHIC SCALE

CRUNK ENGINEERING LLC
1894 GENERAL GEORGE PATTON DR.
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FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

ENGINEERING CRUNK

WILSON CAIN REGISTERED LANDSCAPE ARCHITECT AGRICULTURE COMMERCE No. 114180 STATE OF TENNESSEE 4/7/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

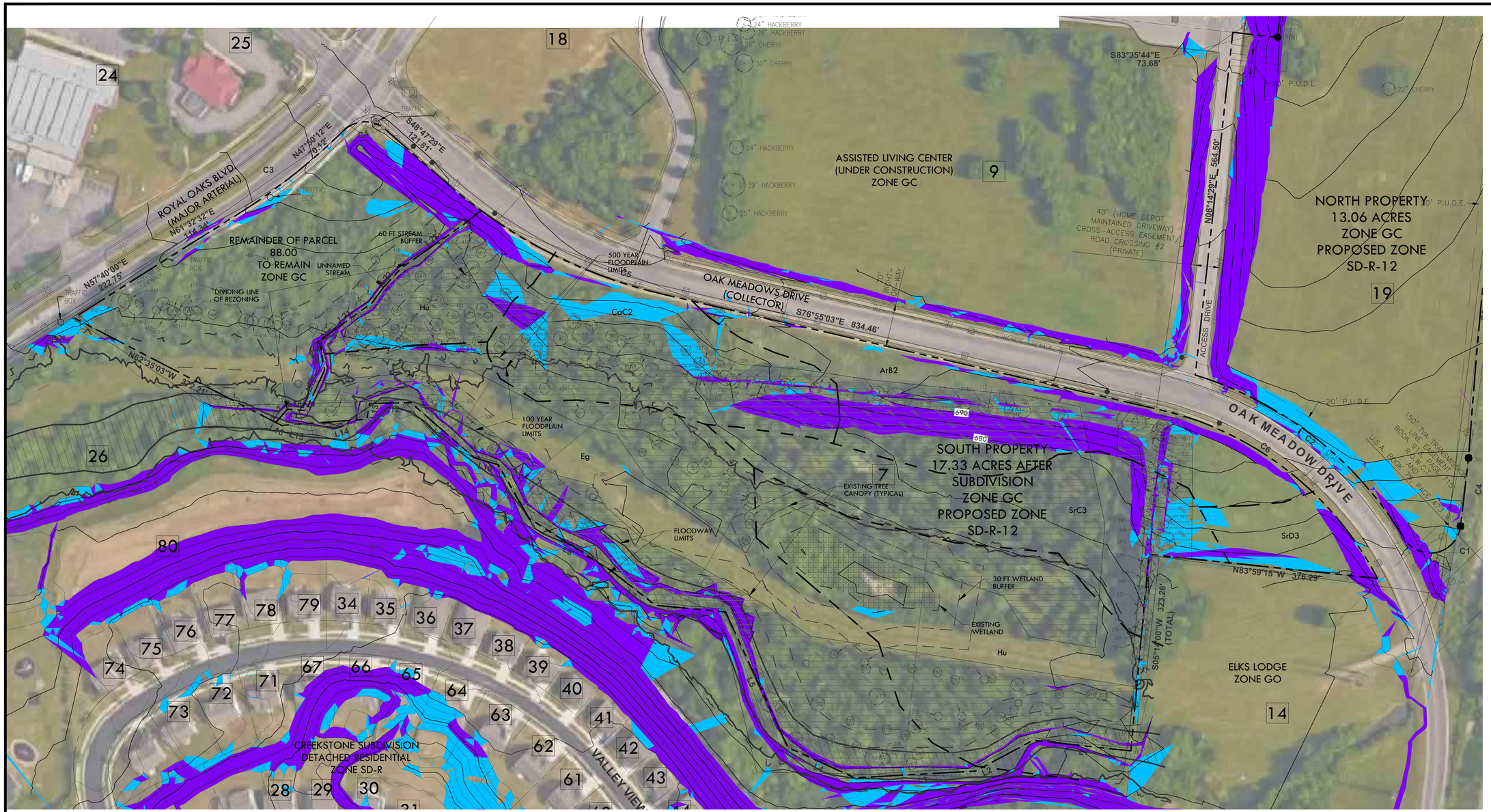
REVISIONS

No.	DATE

04/07/16 15001

C1.1

NORTH SITE EXISTING CONDITIONS PLAN



SLOPE LEGEND

- GREATER THAN 14% AND LESS THAN 20% SLOPE
- GREATER THAN 20% SLOPE

SOIL TYPES

ArB2	Armour silt loam, 2% to 5 % slopes, eroded
CaC2	Captina silt loam, phosphatic, 5% to 12% slopes, eroded
Eg	Egam silt loam, phosphatic
Hu	Huntington silt loam, phosphatic
InE3	Inman silty clay loam, 20% to 30% slopes, severely eroded
MbB2	Maury silt loam, 2% to 5% slopes, eroded
MbC2	Maury silt loam, 5% to 12% slopes, eroded
SrC3	Stiversville clay loam, 5% to 12% slopes, eroded
SrD3	Stiversville clay loam, 12% to 20% slopes, severely eroded
StC2	Stiversville silt loam, 5% to 12% slopes, eroded

0 40 80 160
GRAPHIC SCALE

N

CRUNK ENGINEERING LLC
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WWW.CRUNKENG.COM

CRUNK ENGINEERING

TIMOTHY WILSON CALL
LICENSED PROFESSIONAL ENGINEER
AGRICULTURE
4/7
No. 114180
STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

REVISIONS		
No.	DATE	

04/07/16 15001

C1.2

SOUTH SITE EXISTING CONDITIONS PLAN

CREEKSTONE SUBDIVISION CROSS SECTION
THROUGH WATSON BRANCH

BRICK TRASH ENCLOSURE EXAMPLE

SITE DATA

PROJECT NAME	OAK MEADOWS EPOCH DEVELOPMENT REZONING & PUD APPLICATION
PROJECT NUMBER:	TBD
LOTS:	2 EXISTING, 3 PROPOSED
ADDRESS:	840 & 880 OAK MEADOWS DR.
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH
MAP, GROUP AND PARCEL NUMBERS:	MAP 79, PARCELS 88.00 (PORTION OF) & 101.19
EXISTING ZONING:	GC (GENERAL COMMERCIAL)
PROPOSED ZONING:	SD-R (12) (SPECIFIC DEVELOPMENT RESIDENTIAL 12 UNITS/AC)
CHARACTER AREA OVERLAY:	MECO-5
OTHER APPLICABLE OVERLAYS:	FFO & FWO
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	13.06 + 17.33 = 30.39 ACRES
SQUARE FOOTAGE OF SITE:	569,021 + 754,942 = 1,323,963 SQUARE FEET
MINIMUM REQUIRED SETBACK LINES:	ATTACHED RESIDENTIAL USE
YARD FRONTING COLLECTOR (OAK MEADOWS)	40'
SIDE YARD	15'
REAR YARD	30'
OWNER (BOTH PARCELS):	E. WARNER BASS, TRUSTEE
ADDRESS:	150 3RD AVE. SOUTH, SUITE 2800, NASHVILLE, TN 37201
PHONE NO.:	615.742.6400
E-MAIL ADDRESS:	wbass@bassberry.com
CONTACT NAME:	MR. WARNER BASS
MINERAL RIGHTS:	CONTROLLED BY CURRENT PROPERTY OWNER
APPLICANT:	CRUNK ENGINEERING LLC
ADDRESS:	1894 GEN. GEORGE PATTON DR., SUITE 600 FRANKLIN, TN 37067
PHONE NO.:	615.873.1795
E-MAIL ADDRESS:	adam@crunkeng.com
CONTACT NAME:	MR. ADAM CRUNK, P.E.
DENSITY	
ATTACHED DWELLING UNITS	355 UNITS
LAND AREA	30.39 ACRES
LAND AREA WITHIN FLOODPLAIN OVERLAY	8.32 ACRES
OVERALL DENSITY	11.7 UNITS/ACRE
NET DENSITY (MINUS OVERLAY CONSTRAINT)	16.1 UNITS/ACRE
BUILDING HEIGHT	
ALLOWABLE	6 STORIES MAXIMUM
PROPOSED	NORTH PARCEL - 4 STORIES SOUTH PARCEL 2/3 STORIES (2 STORY FACING STREET)
PROPOSED LANDSCAPE SURFACE RATIO:	NORTH SITE - 0.42; SOUTH SITE - 0.56; COMBINED - 0.50
MINIMUM LANDSCAPE SURFACE RATIO:	0.20

PARKING

EXISTING 0

REQUIRED (1.5/1BR + 2.5/2BR + 3/3BR)

NORTH SITE		SOUTH SITE	
1BR - 104 UNITS * 1.5 =	156 SPACES	1BR - 45 UNITS * 1.5 =	68 SPACES
2BR - 112 UNITS * 2.5 =	280 SPACES	2BR - 50 UNITS * 2.5 =	125 SPACES
3BR - 24 UNITS * 3.0 =	72 SPACES	3BR - 20 UNITS * 3.0 =	60 SPACES
TOTAL REQUIRED	= 508 SPACES	TOTAL REQUIRED	= 253 SPACES
INCLUDING 9 ADA SPACES		INCLUDING 7 ADA SPACES	

MAXIMUM PARKING: NORTH SITE - 610 SPACES; SOUTH SITE - 304 SPACES

*MODIFICATION OF STANDARD REQUEST TO REDUCE PARKING REQUIREMENT TO 1.75 PER UNIT
NORTH SITE = 240 X 1.75 = 420 SPACES
SOUTH SITE = 115 X 1.75 = 202 SPACES

PROPOSED

NORTH SITE		SOUTH SITE (APTS. ONLY)	
REGULAR SPACES	329	REGULAR SPACES	198
COMPACT SPACES (22 % OF TOTAL)	84	COMPACT SPACES (8 % OF TOTAL)	19
ADA SPACES	16	ADA SPACES	8
TOTAL PROVIDED	429	TOTAL PROVIDED	225
		SOUTH SITE (AMENITY CTR.)	
		REGULAR SPACES	24
		COMPACT SPACES (0% OF TOTAL)	0
		ADA SPACES	2
		TOTAL PROVIDED	26

TREE CANOPY:

EXISTING CANOPY COVERAGE	NORTH SITE - 9%	SOUTH SITE - 65%
REQUIRED PERCENTAGE TO REMAIN	NORTH SITE - 54%	SOUTH SITE - 36%
PROPOSED PERCENTAGE TO REMAIN	NORTH SITE - 54%	SOUTH SITE - 42%

PARKLAND DEDICATION: FEE IN LIEU OF FOR 5.37 ACRES, 355 TOTAL UNITS PROPOSED

OPEN SPACE:

TOTAL OPEN SPACE REQ'D (15% OF 30.39 AC.)	4.56 AC.
FORMAL OPEN SPACE REQUIRED (33% OF OPEN SPACE REQUIRED)	1.52 AC. 1.65 AC. PROVIDED
INFORMAL OPEN SPACE REQUIRED (67% OF OPEN SPACE REQUIRED)	3.04 AC. 8.9 AC. PROVIDED

USE BUFFER: 50-FT CLASS C INCOMPATIBLE LAND USE BUFFER (SOUTH PORTION OF SOUTH SITE)
40-FT INTERSTATE BUFFER (EAST PORTION OF NORTH SITE)

PROJECT NOTES:

1) The proposed project complies with the Land Use Plan as it was amended in December 2015 to allow for attached residential uses along with a mixture of other uses. The project is in the McEwen Character Area, Special Area 5. Conventional standards are proposed project since that is the predominant design character of the fully developed surrounding area. The project will remain compatible with its surroundings by proposing two story buildings on the southern site to act as a transition from single family uses to the south and commercial developments to the north. The Northern site will have four story heights to match the adjacent office buildings to the north. The Northern site lends itself to a denser development due to its proximity to the interstate, and surrounding commercial uses.
2) The architectural intent can be best described by the attached elevations proposed for the project. The Southern site intent is to have more of a single family or townhome look. The Northern site intent is to blend with the souther site and new assisted living center that is currently under construction.
3) There are no planned phases of the project. The intent is to begin construction on both parcels at the end of 2016, with the possibility of opening units on the southern property in 2018 and having fully completed the northern property by 2019.

PROPERTY IS LOCATED ON MAP 79 AS A PORTION OF LOT 88.00 AND PARCEL 101.19 CONTAINING 30.39 ACRES.

PARCEL 88.00 DOES LIE WITHIN THE 100-YEAR FLOOD PLAIN AS INDICATED BY FIRM MAP NO. 47187C0212F DATED SEPTEMBER 29, 2006.

STATEMENT OF IMPACT:

The proposed project will add 355 multi-family units. The property is currently undeveloped within the existing City Limits of the City of Franklin. Therefore, no new land is being developed outside the existing jurisdiction of City of Franklin Police, Fire, or Solid Waste services.

The project is approximately a 4 mile driving distance from the Police Station; 1.5 mile driving distance from the nearest fire station on Murfreesboro Rd.
The project will have two dumpster locations for solid waste. One serving 240 units and the other serving 115 units.
No new parkland is being dedicated as part of this project. However, this project will contribute to parkland funds.

0 50 100 150 300
GRAPHIC SCALE

N

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ENGINEERING CRUNK

WILSON COUNTY AGRICULTURE 4/7 COMMERCE 114 1801 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C2.0

OVERALL DEVELOPMENT PLAN

TOTAL OF 240 UNITS ON NORTH PARCEL

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	50.00'	123.89'	141°58'19"	145.10	94.54'	S77°58'06"W
C2	607.96'	443.66'	41°48'42"	232.23	433.88'	N51°57'06"W
C3	11300.00'	470.04'	2°23'00"	235.06	470.01'	S05°13'09"W
C4	11300.00'	112.73'	0°34'18"	56.37	112.73'	S06°41'48"W

0 30 60 120
GRAPHIC SCALE

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ENGINEERING CRUNK

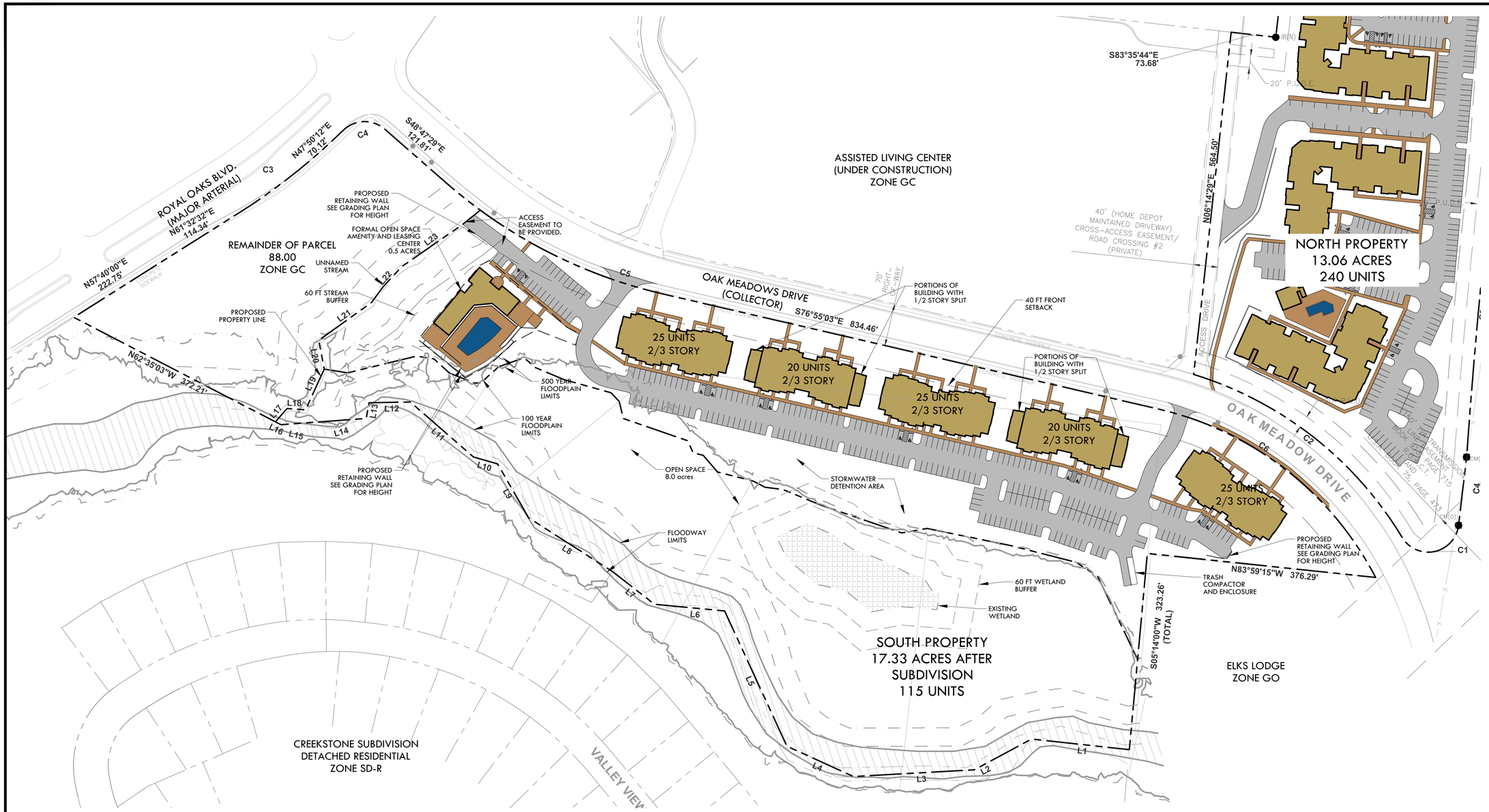
WILSON CAUDLE REGISTERED LANDSCAPE ARCHITECT AGRICULTURE 4/7/16 COMMERCE No. 114180 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT
PUD SUBDIVISION, DEVELOPMENT PLAN
COF #6086 FRANKLIN, TN

REVISIONS
No. DATE

04/07/16 15001

C2.1
NORTH SITE DEVELOPMENT PLAN



LINE TABLE		
LINE	BEARING	DISTANCE
L1	N83°48'10"W	161.22'
L2	S61°46'08"W	106.65'
L3	S86°48'30"W	198.12'
L4	N65°28'52"W	120.02'
L5	N24°43'04"W	244.21'
L6	N84°36'00"W	115.35'
L7	N52°04'01"W	87.70'
L8	N57°18'12"W	163.19'
L9	N29°52'55"W	101.80'
L10	N74°02'09"W	41.15'
L11	N48°56'27"W	137.25'
L12	S88°57'25"W	67.60'
L13	S10°32'54"W	26.12'

LINE TABLE		
LINE	BEARING	DISTANCE
L14	S74°19'35"W	89.75'
L15	N75°22'06"W	55.08'
L16	N62°35'03"W	10.27'
L17	N39°40'55"E	27.30'
L18	S89°07'57"E	31.47'
L19	N25°32'12"E	70.78'
L20	N10°00'40"W	49.37'
L21	N54°59'41"E	103.02'
L22	N40°36'36"E	74.71'
L23	N53°28'05"E	164.68'

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C5	820.00'	330.94'	23°07'24"	167.75	328.69'	S65°21'21"E
C6	537.96'	464.57'	49°28'46"	247.89	450.27'	S52°10'40"E

TOTAL OF 115 UNITS ON SOUTH PARCEL

0 40 80 160
GRAPHIC SCALE

N

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TIMOTHY WILSON CAMP
REGISTERED LANDSCAPE ARCHITECT
AGRICULTURE
4/7/16
COMMERCE
No. 114180
STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

FRANKLIN, TN

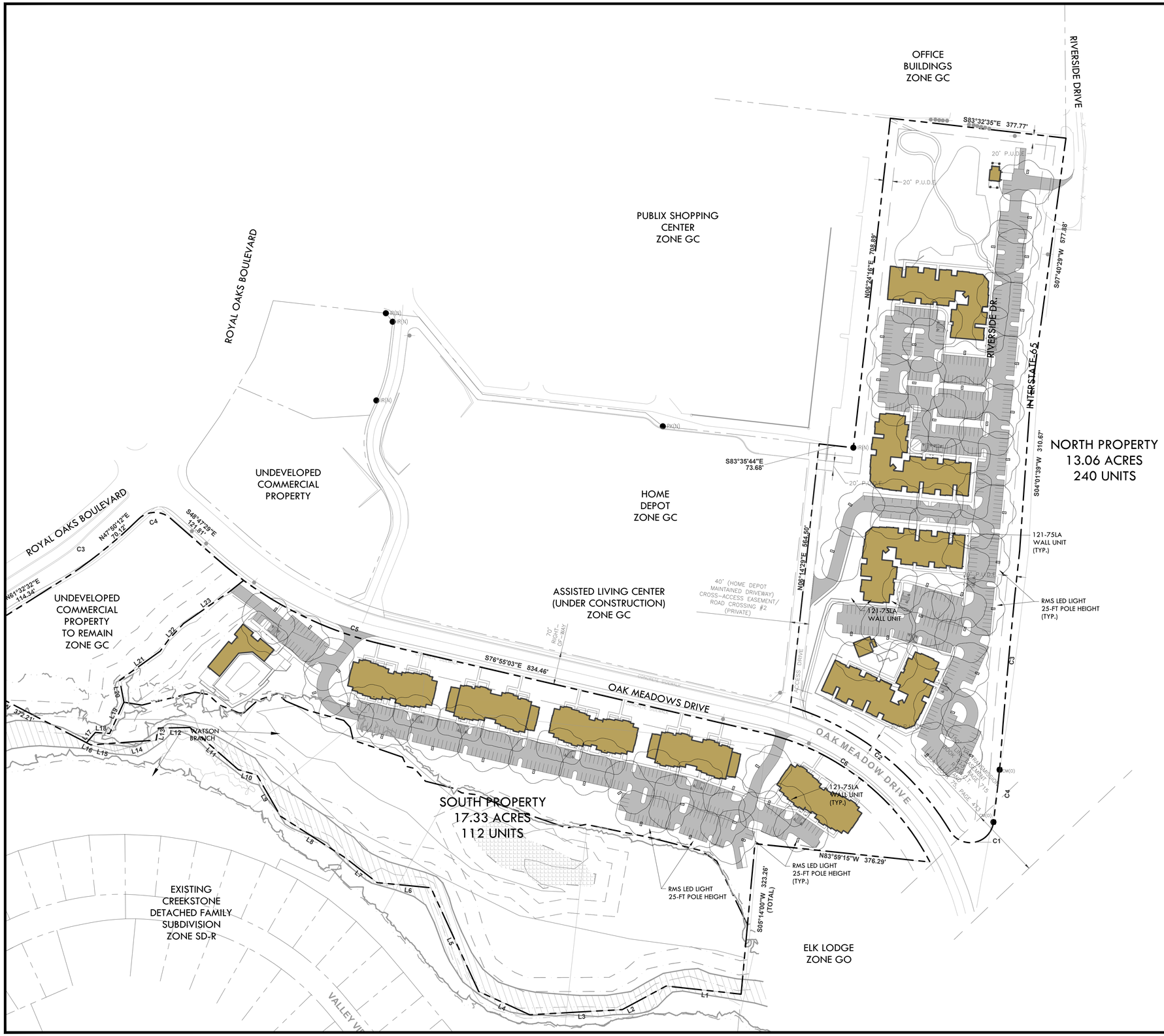
COF #6086

REVISIONS		
No.	DATE	

04/07/16 15001

C2.2

SOUTH SITE DEVELOPMENT PLAN



SITE LIGHTING DATA

NOTE:

STREET LIGHT LOCATIONS AND QUANTITIES ARE APPROXIMATE. FINAL POSITIONING AND QUANTITIES SHALL BE AT THE DIRECTION OF MTEMC.

DEVELOPMENT STANDARD:	CONVENTIONAL
LAND USE:	RESIDENTIAL
ZONING DISTRICT:	SD-R (SPECIFIC DEVELOPMENT RESIDENTIAL
HEIGHT OF PROPOSED BUILDING:	30 FT.
POLE HEIGHT:	25 FT. & 10 FT.
POLE/FIXTURE COLOR:	BLACK/WHITE
COLOR OF LIGHT:	WHITE

THE LIGHTING PLAN HAS BEEN DESIGNED TO MEET THE CITY OF FRANKLIN STANDARDS AND THE APPROVAL OF THE PLANNING COMMISSION / CITY OF FRANKLIN.

CHANGES SHALL NOT BE MADE TO THE APPROVED LIGHTING PLAN UNLESS APPROVED BY EITHER THE RELEVANT DEPARTMENT SUPERINTENDENT OR THE PLANNING COMMISSION.

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ENGINEERING CRUNK

WILSON CRAIG REGISTERED LANDSCAPE ARCHITECT AGRICULTURE COMMERCE No. 114180 STATE OF TENNESSEE 4/7/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

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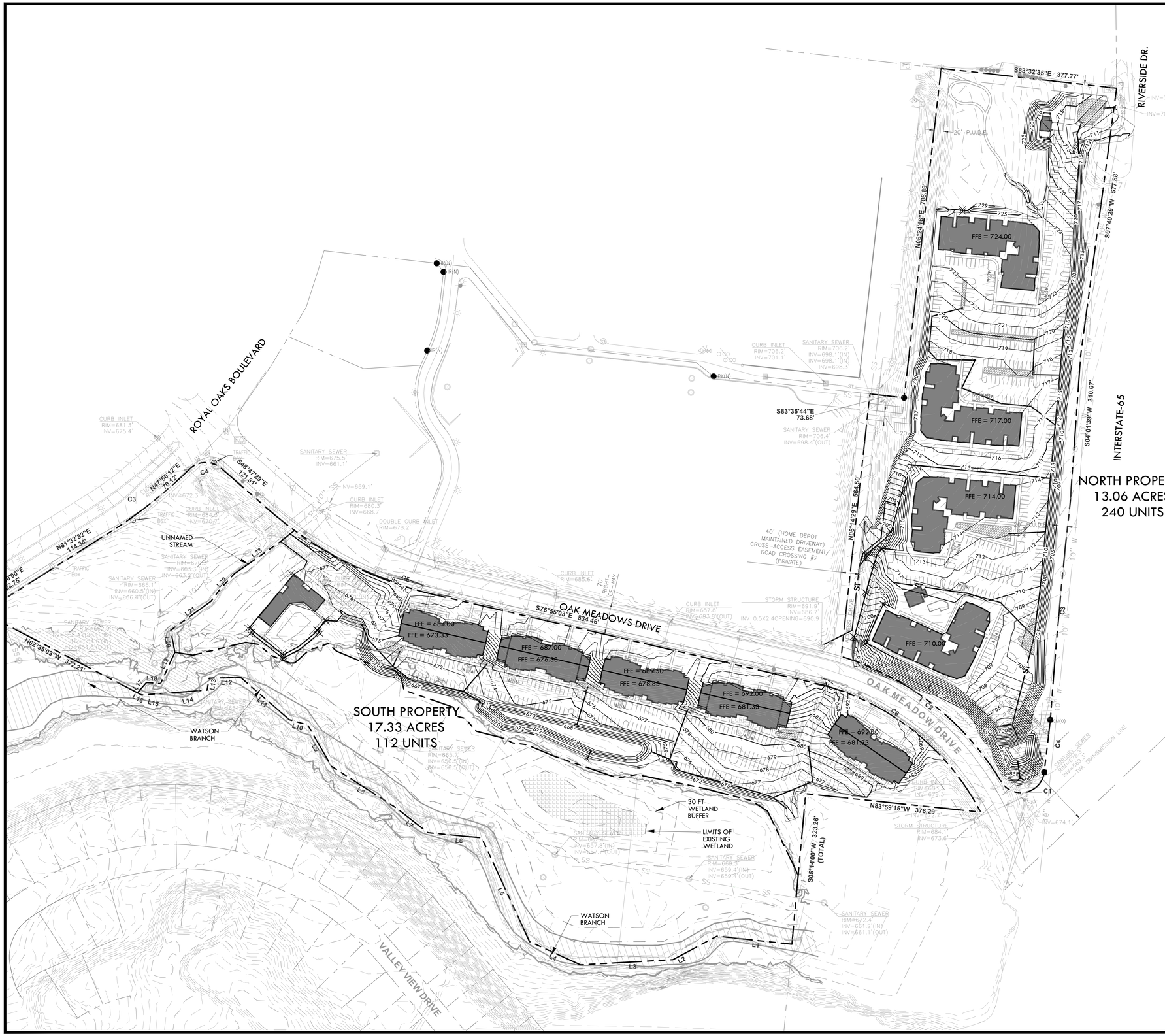
C2.3

GENERAL LIGHTING PLAN



Grading & Drainage General Notes

1. Grading Permit is required for any project disturbing more than 10,000 sf, adding more than 5,000 sf of impervious surface or for any site grading requiring stockpiling of material.
2. The Developer shall provide the necessary labor and supervision required to support field testing by the independent testing firm and inspections by City officials at no cost to the City. Test reports of field testing if applicable shall be submitted directly to the Street Department. Defects disclosed by tests shall be rectified.
3. An authorized representative of the City shall make a final inspection of the project after completion to determine acceptability of the work and for release of performance bonds if required. Before this final inspection can be made, the Engineer responsible for the project shall certify in writing to the City Engineer that the work has been completed in accordance with approved plans and specifications.
4. Drainage facilities including, but not limited to, culverts, detention basins and ditches, as well as the roadway sub-grade, base stone and binder & surface coarse shall be inspected, tested and given approval at each stage of installation prior to proceeding to the next stage of construction. Final construction inspection for approval and acceptance of streets and drainage systems will not be granted until all work has been completed in accordance with the approved
5. Locating and coordination for the relocation of existing utilities is the responsibility of the contractor. Tennessee's One-Call and the City of Franklin utility location service shall be utilized in addition to coordination with local utility owners. The contractor shall at all times protect existing utilities and will be responsible for costs due to damage caused to any utility lines.

STORMWATER NARRATIVE

THE PROPOSED DEVELOPMENT IS DIVIDED INTO TWO SITE AREAS, A 13.06 ACRE NORTH SITE AND A 17.33 ACRE SOUTH SITE. THE NORTH SITE OUTFALLS TO AN EXISTING PIPE IN THE SOUTHEAST CORNER OF THE SITE THAT CROSSES OAK MEADOWS DRIVE TO WATSON BRANCH. THE SOUTH SITE SLOPES TO THE SOUTH INTO WATSON BRANCH WHICH RUNS ALONG THE SOUTHERN PROPERTY LINE. EACH SITE WILL CONTAIN RAIN GARDEN/BIO-RETENTION AREAS THAT WILL TREAT THE NEW IMPERVIOUS AREAS. PERVIOUS PAVEMENT AREAS WILL BE PROVIDED IN DESIGNED LOCATIONS WITHIN THE PARKING LOTS TO PROVIDE ADDITIONAL STORMWATER TREATMENT. THESE AREAS WILL THEN BE ROUTED TO A STORMWATER DETENTION AREA ADJACENT TO THE OUTFALL LOCATIONS FOR BOTH SITED TO ENSURE THE SITE MEETS THE DETENTION REQUIREMENTS.

IMPACT STATEMENT:

THE PROPOSED DEVELOPMENT CONTAINS TWO SITE FEATURES THAT WILL BE PROTECTED DURING CONSTRUCTION. THE SOUTH SITE CONTAINS A WETLAND AREA AS WELL AS A STREAM, WATSON BRANCH. THE SITE HAS BEEN DESIGNED NOT TO IMPACT THESE SITE FEATURES. THE REQUIRED BUFFERS FOR EACH FEATURE HAVE BEEN SHOWN ON THESE PLANS.

GRADING & DRAINAGE DATA CHART

- SITE AREA
  - NORTH = 13.06 AC
  - SOUTH = 17.33 AC
  - TOTAL = 30.39
- IMPERVIOUS AREA
  - NORTH = 6.31 AC
  - SOUTH = 4.19 AC
  - TOTAL = 10.50 AC
- DISTURBED AREA
  - NORTH = 9.7 AC
  - SOUTH = 8.4 AC
  - TOTAL = 18.1 AC
- Rv VALUE = 0.406*
- PEAK FLOW RUNOFF *
  - T.B.D

*PROPOSED DEVELOPMENT WILL COMPLY WITH CITY OF FRANKLIN STORMWATER REQUIREMENTS TO PROVIDE A TREATED Rv VALUE OF LESS THAN OR EQUAL TO 0.200. THE PROPOSED DEVELOPMENT WILL DETAIN THE PEAK FLOWS FOR THE 2 YEAR THROUGH 100 YEAR STROM EVENTS.

STREAM BUFFER NOTE:

THERE SHALL BE NO MOWING, CLEARING, GRADING, CONSTRUCTION, STORAGE, OR DISTURBANCE OF VEGETATION IN RIPARIAN BUFFERS EXCEPT AS PERMITTED BY THE CITY ENGINEER, OR HIS DESIGNEE.

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ENGINEERING CRUNK

JEFFREY WILSON CRUNK — REGISTERED — AGRICULTURE — COMMERCE — No. 114180 — STATE OF TENNESSEE — 4/7/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

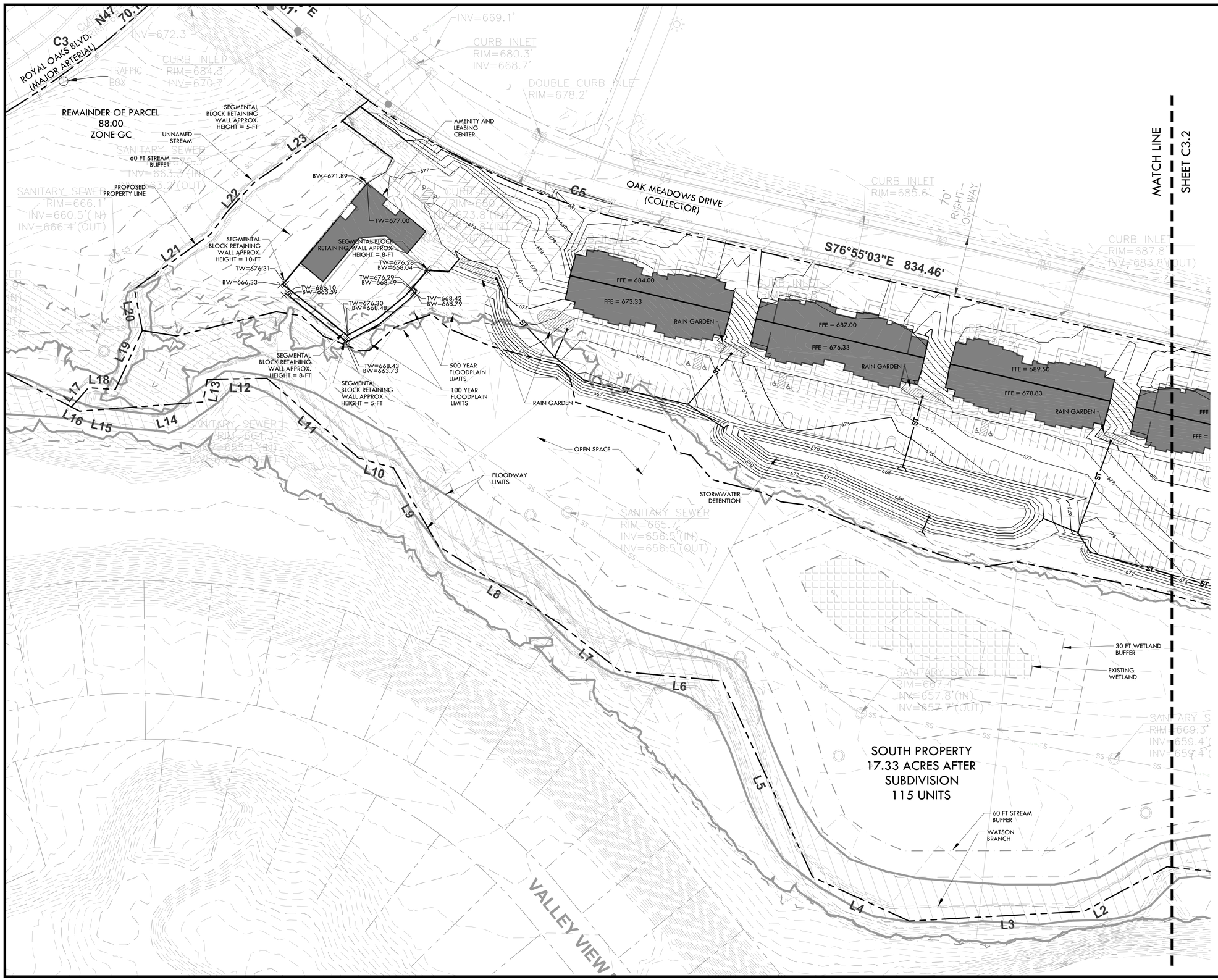
COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C3.0

OVERALL GRADING PLAN



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WILSON CAMPBELL REGISTERED LANDSCAPE ARCHITECT AGRICULTURE COMMERCE 114180 STATE OF TENNESSEE 4/7

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

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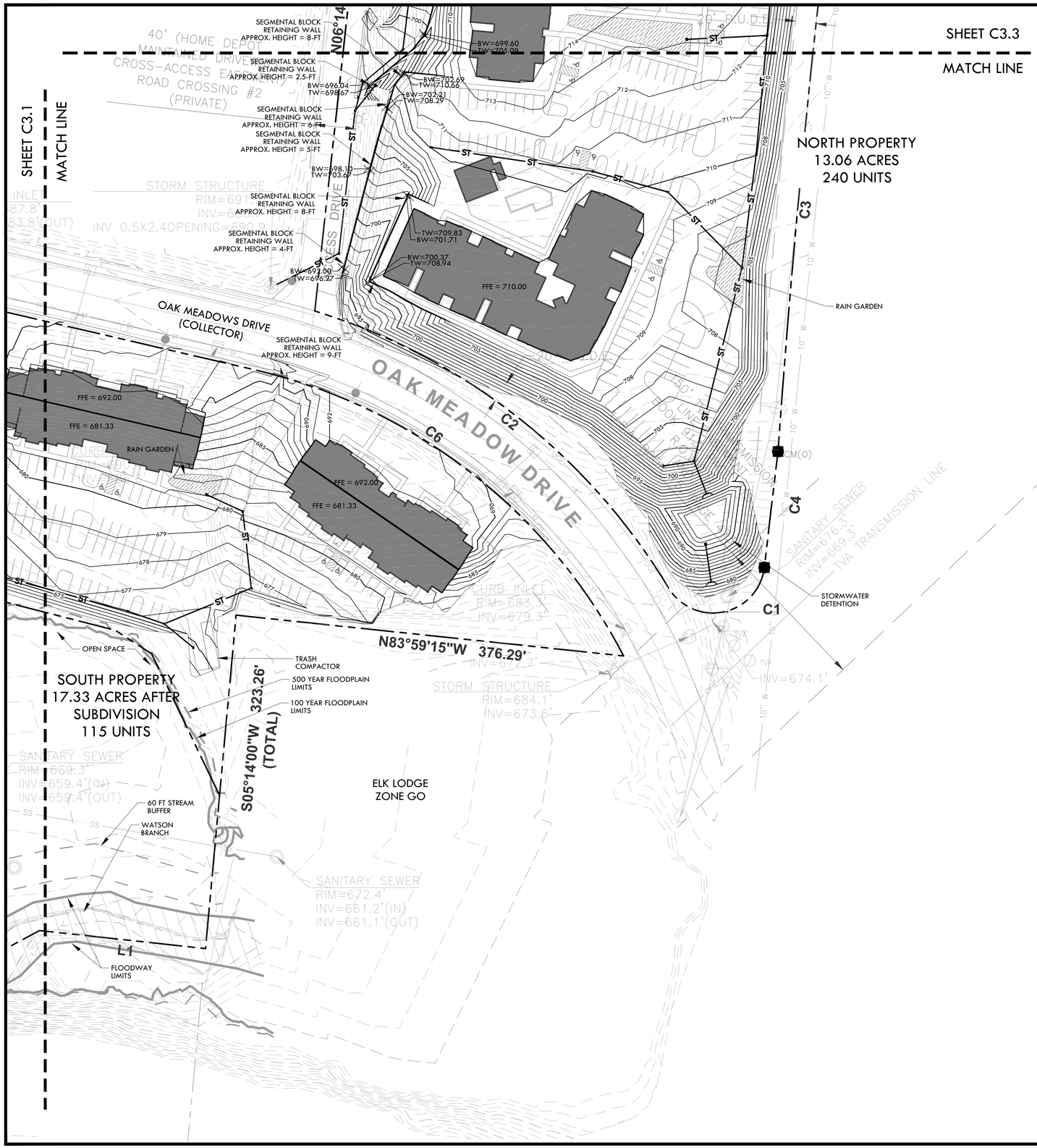
C3.1

SOUTH SITE GRADING PLAN



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ENGINEERING CRUNK

WILSON CAIN REGISTERED LANDSCAPE ARCHITECT AGRICULTURE COMMERCE No. 114180 STATE OF TENNESSEE 4/7/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

FRANKLIN, TN

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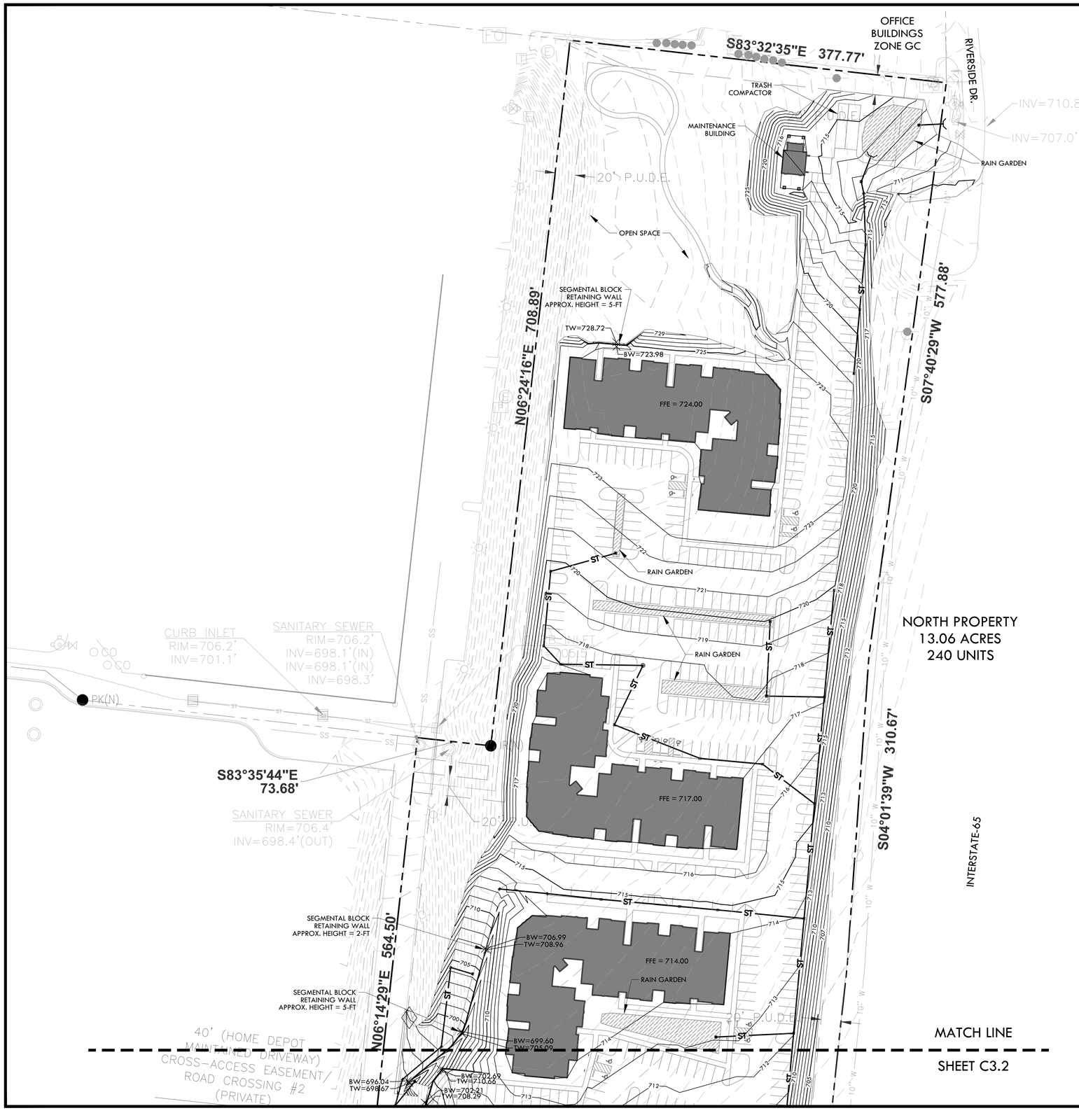
C3.2

SOUTH & NORTH SITE GRADING PLAN



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ENGINEERING CRUNK

JOHN WILSON CARR
REGISTERED
AGRICULTURE
COMMERCE
No. 114180
STATE OF TENNESSEE
4/7/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

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C3.3

NORTH SITE GRADING PLAN

NOTE THAT NO NEW R.O.W. IS PROPOSED FOR THIS PROJECT. REFER TO TRAFFIC STUDY FOR INFORMATION REGARDING L.O.S.

STATEMENT OF IMPACT:
The proposed project will add 355 multi-family units with access along Oak Meadow Drive and Riverside Drive. The primary road corridor serving the project is the major arterial South Royal Oaks Boulevard. Based on the traffic study performed for this project, the majority of traffic will be directed in the northernly direction toward Cool Springs.

R.O.W. & Access General Notes

1. Prior to beginning any construction, the Developer and/or Contractor, shall obtain all necessary permits as required by law. Such permits may include, but are not limited to, those required by State of Tennessee, Williamson County and other City of Franklin agencies.
2. All off-site work within the public right-of-way shall require an approved traffic control plan which complies with the MUTCD. No off-site excavation may be undertaken in any street, road, alley or right-of-way of any utility or temporary construction easement of the City of Franklin by any entity unless 72-hour notice has been given to the City of Franklin Traffic Operations Center. The contractor shall have an approved traffic control plan onsite during construction.
3. Construction materials shall be fully tested in accordance with the designations and requirements within the referenced "TDOT Standard Specifications" sections, unless otherwise noted within the "Standard Specifications" section of the City of Franklin Transportation & Street Technical Standards.
4. An authorized representative of the City shall make a final inspection of the project after completion to determine acceptability of the work and for release of performance bonds if required. Before this final inspection can be made, the Engineer responsible for the project shall certify in writing to the City Engineer that the work has been completed in accordance with approved plans and specifications.
5. Locating and coordination for the relocation of existing utilities is the responsibility of the contractor. Tennessee's One-Call and the City of Franklin utility location service shall be utilized in addition to coordination with local utility owners. The contractor shall at all times protect existing utilities and will be responsible for costs due to damage caused to any utility lines.
6. All temporary striping shall conform to "Standard Specifications for Road and Bridge Construction," published by TDOT, the latest revision except as herein amended. When approved, temporary striping shall be required prior to the opening of a street for travel where pavement and/or permanent striping cannot be completed due to weather and/or time constraints.
7. Thermoplastic pavement markings should be used on all public and private City street projects. Thermoplastic traffic striping and pavement markings shall conform to Section 716.03 "Thermoplastic Pavement Markings", of the Tennessee Department of Transportation Specifications (TDOT), and to the City of Franklin Transportation & Street Technical Standards.

The Epoch Development R.O.W. & Access Data Chart
Daily Trip Generation: 2,360 veh per day
Peak Hour Trip Generation: 145 AM / 143 PM veh per hour
Traffic Impact Study Required: YES
Circulation Plan Required: NO

Access Management
Min. Distance Between Intersection: 600 FT
Min. Distance Between high volume/alleys & Intersections: 300 FT
Min. Distance Between driveway & Intersections: 300 ft
Driveway Width (two-way): 24 ft
Driveway Approach Street Configuration: 15 ft Radius Return or Curb Cut.

FIRE TRUCK TURNING MOVEMENT INFORMATION

Number of Front Axles 1
Front Track Width = 8'
Wheels on Each Front Axle = 2
Number of Rear Axles = 2
Rear Track Width = 8'
Wheel Base = 21.316' (Front Axle to Front Rear Axle)
Rear Axle Spacing = 4.417'
Body Length = 50.0417
Width = 8.333'
Rear Overhang = 22.1424'
Body Style = Fire Truck
Turning Radius Wall to Wall = 42'

ROW ACCESS POINT

0 40 80 160
GRAPHIC SCALE

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ENGINEERING CRUNK

WILSON CAIN — REGISTERED LANDSCAPE ARCHITECT — AGRICULTURE — COMMERCE — No. 114180 — STATE OF TENNESSEE — 4/7/16

THE EPOCH DEVELOPMENT
PUD SUBDIVISION, DEVELOPMENT PLAN
FRANKLIN, TN
COF #6086

REVISIONS		
No.	DATE	

04/07/16 15001

C4.0
OVERALL ACCESS PLAN

SOUTH PROPERTY
17.33 ACRES AFTER SUBDIVISION
115 UNITS

ASSISTED LIVING CENTER
(UNDER CONSTRUCTION)
ZONE GC

HOME DEPOT
ZONE GC

ELK LODGE
ZONE GO

OAK MEADOW DRIVE

40' (HOME DEPOT MAINTAINED DRIVEWAY) CROSS-ACCESS EASEMENT/ ROAD CROSSING #2 (PRIVATE)

260 FT SIGHT DISTANCE IN EACH DIRECTION

ALIGNMENT FOR WESTERN DRIVE PROFILE

ACCESS DRIVE

40 FT FRONT SETBACK

20' P.U.D.E.

60 UNITS
4 STORY

OPEN SPACE

MAINTENANCE BUILDING

POOL AND AMENITY CENTER

TRASH COMPACTOR

OFFICE BUILDINGS
ZONE GC

GATED ENTRY

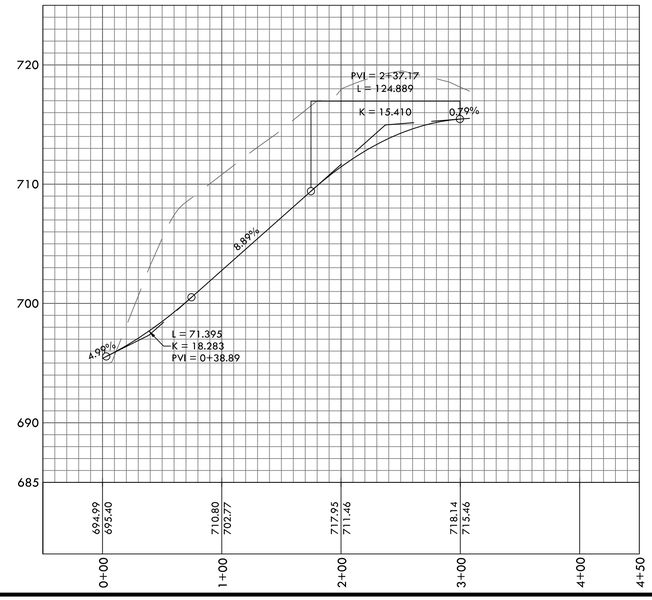
40 FT INTERSTATE BUFFER

NORTH PROPERTY
13.06 ACRES
240 UNITS

INTERSTATE-65

RIVERSIDE DR.

WESTERN DRIVE PROFILE



GRAPHIC SCALE 0 30 60 120

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ENGINEERING CRUNK

WILSON CALDWELL REGISTERED LANDSCAPE ARCHITECT AGRICULTURE COMMERCE No. 114180 STATE OF TENNESSEE 4/7

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

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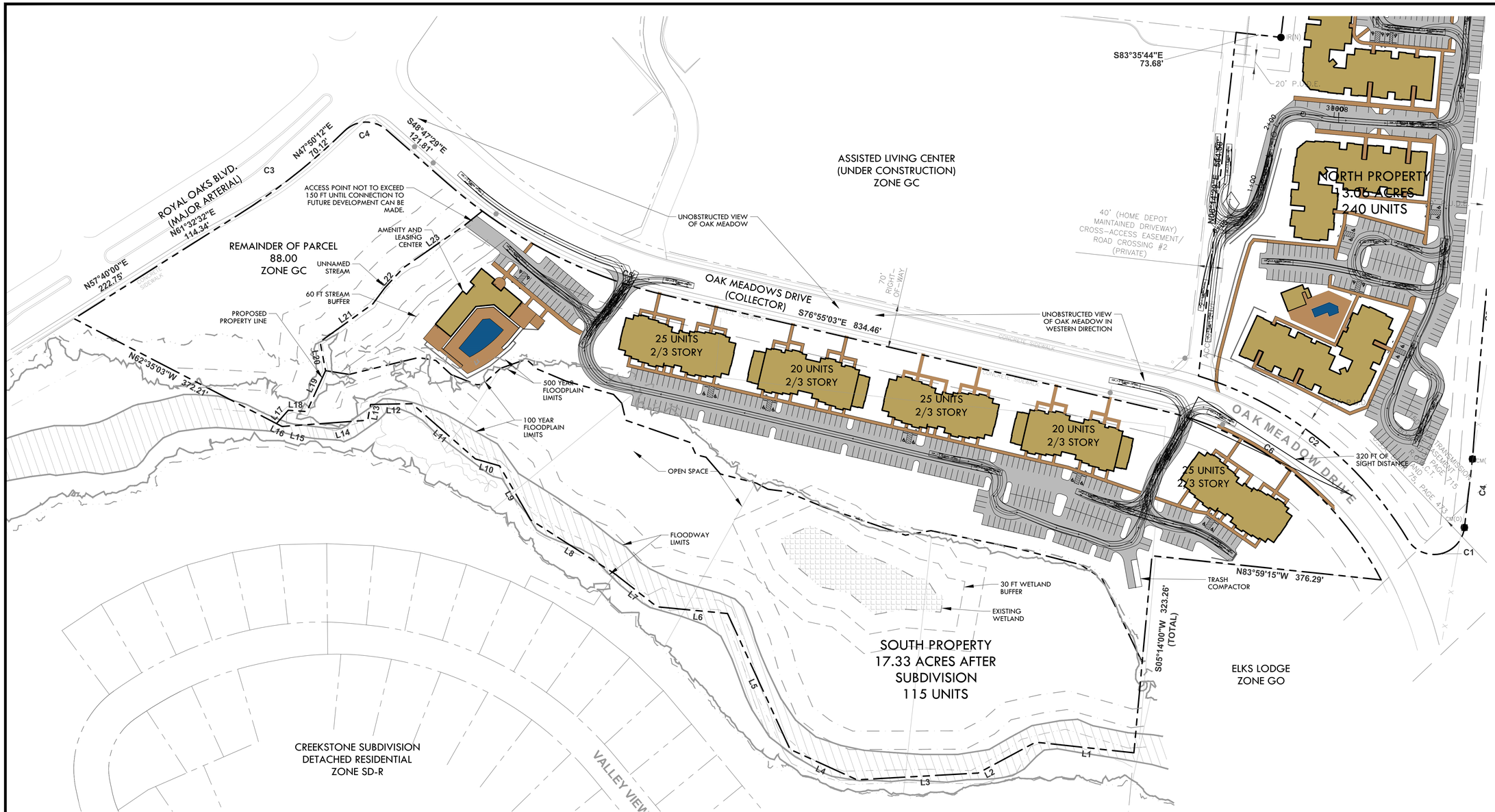
C4.1

NORTH SITE ACCESS PLAN



CRUNK ENGINEERING LLC
1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

ENGINEERING CRUNK

JEFF WILSON CARR
REGISTERED LANDSCAPE ARCHITECT
AGRICULTURE
COMMERCE
No. 114180
STATE OF TENNESSEE
4/7/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

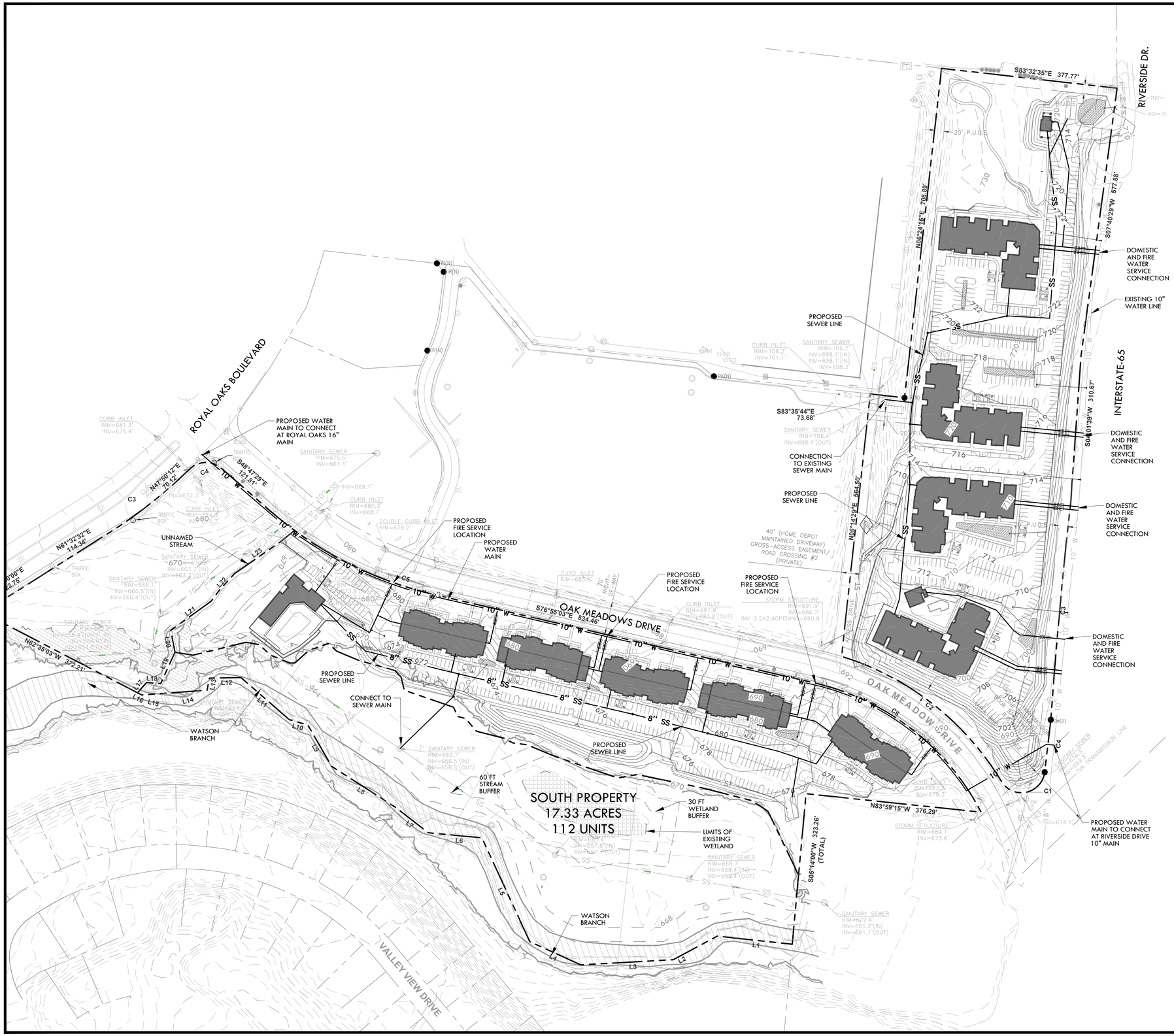
REVISIONS

No.	DATE

04/07/16 15001

C4.2

SOUTH SITE ACCESS PLAN



STATEMENT OF IMPACTS

The proposed project is the construction of 355 new attached dwelling units with a mixture of one, two, and three bedroom units. The project will result in a projected flow of 101,250 GPD. The Northern site will be served by water off of the existing 10" main in the old Riverside Drive ROW, and sewer at the existing manhole behind the Home Depot. The Southern site will be served by water with a new 8" main along Oak Meadow Dr. that will connect from Royal Oaks Blvd. and tie into the 10" main along the old Riverside Drive ROW, and sewer will be served by the existing 24" main that runs along Watson Branch on the subject property. Reclaimed water is not located in the project vicinity.

Water & Sewer General Notes

1. All persons who undertake the construction of water, sewer and/or reclaimed water lines located in, or affecting services provided by the City of Franklin shall comply with the requirements and regulations set forth in the "General Requirements & Technical Specifications, Water Management Department, City of Franklin, Tennessee" latest edition, along with any amendments, additions, or alteration that may thereafter be adopted by the board of mayor and aldermen by resolution.
2. Contractor shall obtain Water & Sewer Infrastructure Installation Permit prior to scheduling required Pre-Construction Site Meeting. Contractor shall complete the PreConstruction Site Meeting prior to commencing with construction.
3. Contractor shall obtain and keep all of the following items on the jobsite at all times during construction:
   a. Approved, Stamped and Signed Water and/or Sewer Plans
   b. Water & Sewer Infrastructure Installation Permit, with all steps completed and signed by appropriate City employees.
   c. Copy of approved availability request response letter.
   d. A copy of all approved Cut Sheets.
4. Acceptance of City of Franklin public water infrastructure, sanitary sewer infrastructure and/or reclaimed water infrastructure shall become the responsibility of the City of Franklin, TN following approval from the City of Franklin Inspectors and acceptance by the Franklin Municipal Planning Commission. The Acceptance date shall be based on the day maintenance sureties are established by the Franklin Municipal Planning Commission.
5. Prior to the acceptance of City of Franklin public water infrastructure, sanitary sewer infrastructure and/or reclaimed water infrastructure the contractor shall be required to submit as-built drawings to the Planning and Sustainability Department.
6. All off-site work within the public right-of-way shall require an approved traffic control plan which complies with the MUTCD. No off-site excavation may be undertaken in any street, road, alley or right-of-way of any utility or temporary construction easement of the City of Franklin by any entity unless 72-hour notice has been given to the City of Franklin Traffic Operations Center. The contractor shall have an approved traffic control plan onsite during construction.
7. Any damages caused to existing utilities during construction shall, at his own expense, be replaced or repaired to original condition and quality, as approved by the owner and representative of the appropriate utility company, by the Contractor.
8. The City of Franklin is not a member of TN one call, contractor's responsibility to contact Franklin Water Management, no less than 72 hours prior to commencing work.
   City of Franklin Water Management Contact:
   124 Lumber Dr.
   Franklin, TN 37064
   Attn: Utility Inspector
   (615) 794-4554

WATER & SEWER DATA CHART

Facility Type:	APARTMENTS
Unit Flow in GPD:	250 GPD for 1-bedroom
	300 GPD for 2-bedroom
	350 GPD for 3-bedroom
Number of Units:	149 1-bedroom
	162 2-bedroom
	44 3-bedroom
Total Flow in GPD:	101,250 GPD

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WWW.CRUNKENG.COM

CRUNK ENGINEERING

WILSON CAMP REGISTERED LANDSCAPE ARCHITECT AGRICULTURE COMMERCE No. 114180 STATE OF TENNESSEE 4/7/16

THE EPOCH DEVELOPMENT
PUD SUBDIVISION, DEVELOPMENT PLAN
FRANKLIN, TN
COF #6086

REVISIONS		
No.	DATE	

04/07/16 15001

C5.0
OVERALL UTILITY PLAN

SOUTH PROPERTY
17.33 ACRES AFTER
SUBDIVISION
115 UNITS

05°14'00"W 323.26'
(TOTAL)

N83°59'15"W 376.29'

OAKMEADOW DRIVE

ACCESS DRIVE

40' (HOME DEPOT MAINTAINED DRIVEWAY) CROSS-ACCESS EASEMENT / ROAD CROSSING #2 (PRIVATE)

S83°35'44"E 73.68'

N06°14'29"E 564.50'

N06°24'16"E 708.89'

S83°32'35"E 377.77'

S04°01'39"W 310.67'

S07°40'29"W 577.88'

RIVERSIDE DR.

INTERSTATE-65

NORTH PROPERTY
13.06 ACRES
240 UNITS

CONNECT TO EXISTING MANHOLE

SANITARY SEWER MANHOLE

SANITARY SERVICE LINE

SANITARY CLEANOUT FOR SERVICE LINE

WATER SERVICE LINE

40 FT FRONT SETBACK

FIRE HYDRANT

OPEN SPACE

MAINTENANCE BUILDING

TRASH COMPACTOR

DOMESTIC AND FIRE WATER CONNECTION

DOMESTIC WATER CONNECTION

WATER MAIN CONNECTION TO RIVERSIDE DRIVE

CURB INLET RIM=687.8' INV=683.8'(OUT) INV 0.5X2.4OPENING=690.9

STORM STRUCTURE RIM=691.9' INV=686.7'

SANITARY SEWER RIM=706.4' INV=698.4'(OUT)

CURB INLET RIM=706.2' INV=701.1'

SANITARY SEWER RIM=706.2' INV=698.1'(IN) INV=698.1'(IN) INV=698.3'

STORM STRUCTURE RIM=684.1' INV=673.6'

CURB INLET RIM=679.3' INV=674.1'

SANITARY SEWER RIM=676.3' INV=669.3'

SANITARY SEWER RIM=676.3' INV=669.3'

TVA TRANSMISSION LINE

INV=707.0'

INV=710.8'

0 30 60 120
GRAPHIC SCALE

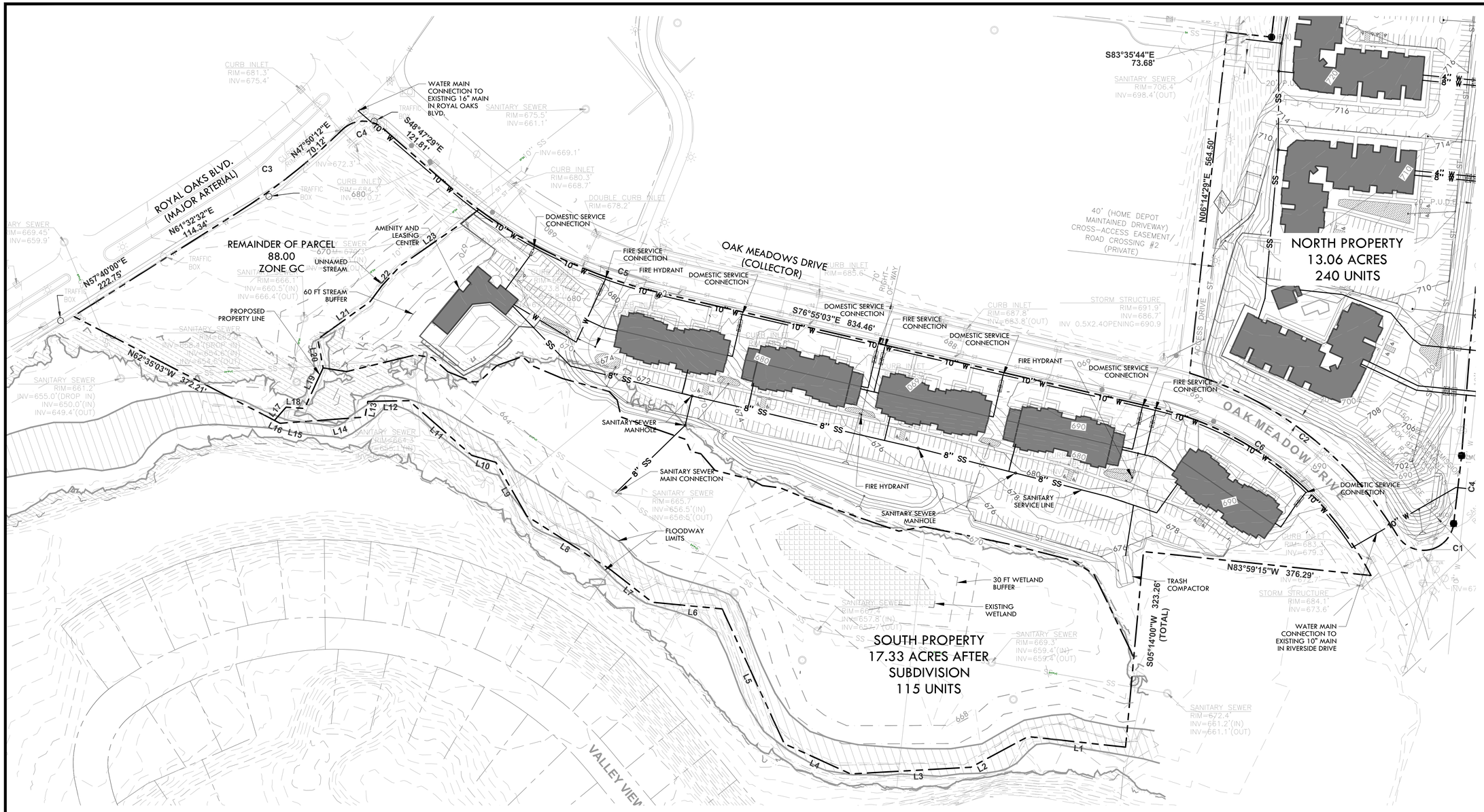
CRUNK ENGINEERING LLC
1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
(615) 873-1795
WWW.CRUNKENG.COM

THE EPOCH DEVELOPMENT
PUD SUBDIVISION, DEVELOPMENT PLAN
COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C5.1
NORTH SITE UTILITY PLAN



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ENGINEERING CRUNK

WILSON CAUDILL REGISTERED LANDSCAPE ARCHITECT AGRICULTURE 4/7/16 No. 114180 STATE OF TENNESSEE

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C5.2

SOUTH SITE UTILITY PLAN

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

ELEVATION

NORTH PARCEL

PROJECT #6068

FUGLEBERG KOCH

EPOCH RESIDENTIAL™

BUILDING ELEVATIONS

2016-04-07

THE EPOCH DEVELOPMENT

FRANKLIN, TENNESSEE

© 2016 FUGLEBERG KOCH, PLLC
2555 TEMPLE TRAIL WINTER PARK, FLORIDA 32789 TEL: 407-629-0595 FAX: 407-628-1057 LICENSE NO. 3705

SIDE ELEVATION

NORTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

PROJECT #6068

FUGLEBERG KOCH

EPOCH RESIDENTIAL™

BUILDING ELEVATIONS

2016-04-07

THE EPOCH DEVELOPMENT

FRANKLIN, TENNESSEE

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NORTH ELEVATION
(OAK MEADOW DRIVE)

SOUTH PARCEL

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

PROJECT #6068

FUGLEBERG KOCH

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BUILDING ELEVATIONS

2016-04-07

THE EPOCH DEVELOPMENT

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SOUTH ELEVATION

GRAPHIC SCALE

16 0 4 8 16

(IN INCHES)
1/16" = 1'-0"

FUGLEBERG KOCH

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SOUTH PARCEL

PROJECT #6068

BUILDING ELEVATIONS

2016-04-07

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GRAPHIC SCALE

8 0 2 4 8

(IN INCHES)
1/8" = 1'-0"

AMENITY / CLUBHOUSE CENTER
ELEVATION

SOUTH PARCEL

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF AGRICULTURE
COMMERCE
NO. 10541
STATE OF TENNESSEE

A5.0

PROJECT #6068

FUGLEBERG KOCH

EPOCH RESIDENTIAL™

BUILDING ELEVATIONS

2016-04-07

THE EPOCH DEVELOPMENT

FRANKLIN, TENNESSEE

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POOL PAVILION ELEVATION

NORTH PARCEL

GRAPHIC SCALE

8 0 2 4 8

(IN INCHES)
1/8" = 1'-0"

KENNETH LINEHAN
REGISTERED ARCHITECT
DEPARTMENT OF AGRICULTURE
COMMERCE
No. 10541
STATE OF TENNESSEE

A6.0

PROJECT #6068

FUGLEBERG KOCH

EPOCH RESIDENTIAL™

BUILDING ELEVATIONS

2016-04-07

THE EPOCH DEVELOPMENT

FRANKLIN, TENNESSEE

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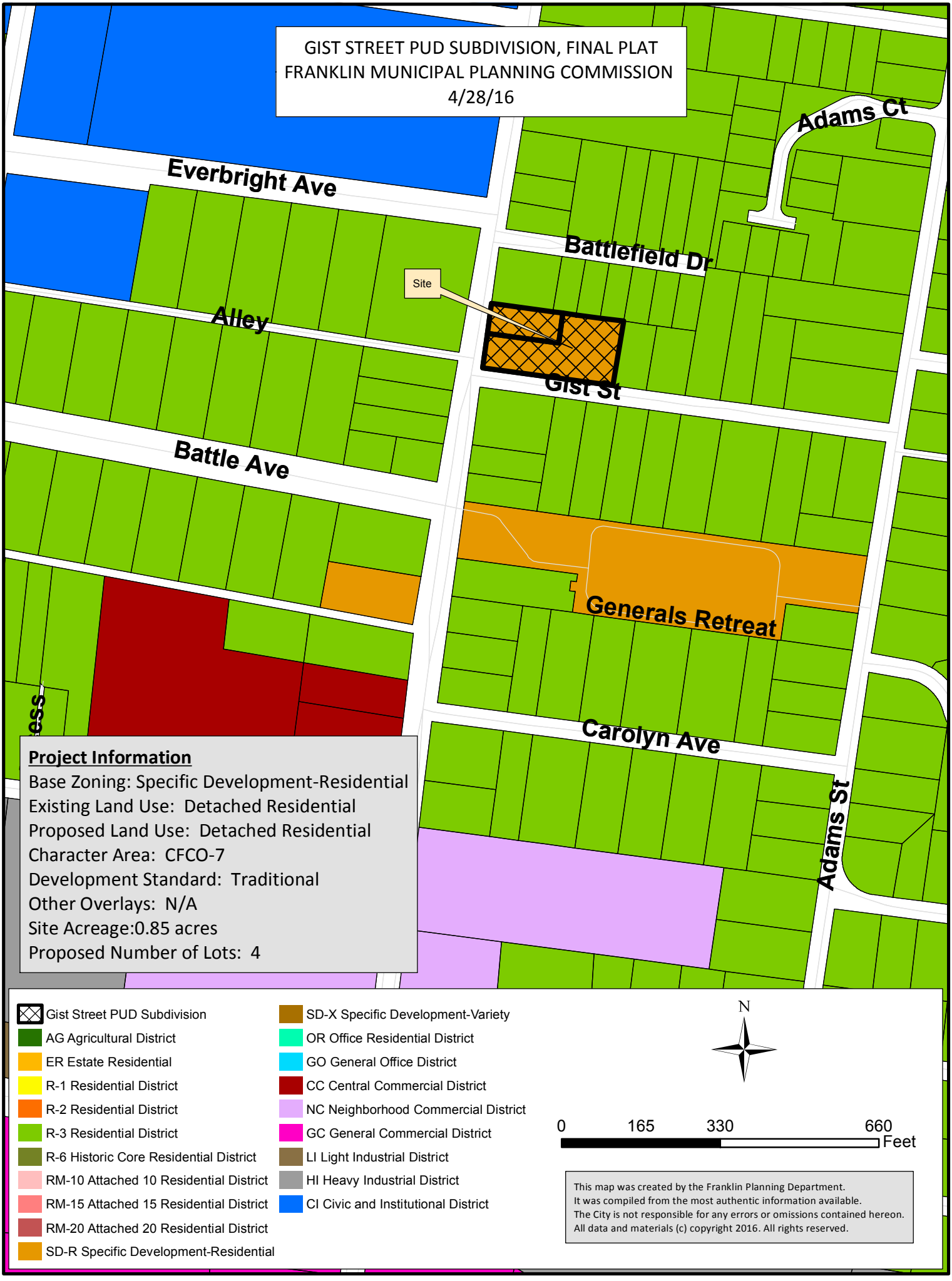
2555 TEMPLE TRAIL WINTER PARK, FLORIDA 32789 TEL: 407-629-0595 FAX: 407-628-1057 LICENSE NO. 3705

Formal Open Space locations: not integrated into the site, but rather “left-over” spaces after building and parking lot locations were set

Detention locations


GIST STREET PUD SUBDIVISION, FINAL PLAT
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/16
Everbright Ave
Adams Ct
Battlefield Dr
Site
Alley
Gist St
Battle Ave
Generals Retreat
Carolyn Ave
Adams St
Project Information
Base Zoning: Specific Development-Residential
Existing Land Use: Detached Residential
Proposed Land Use: Detached Residential
Character Area: CFCO-7
Development Standard: Traditional
Other Overlays: N/A
Site Acreage:0.85 acres
Proposed Number of Lots: 4
Gist Street PUD Subdivision
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
165
330
660
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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COF no: 6011

CONDITIONS OF APPROVAL:

Engineering - Preliminary Plat Checklist

General Comments

1. Offsite easement

-

The previous comment must remain open until the site plan issue related to this comment is completely addressed.
The site plan for this property indicates an off site drainage easement is required. The previous comment "Applicant shall provide an offsite drainage easement for any concentrated stormwater flow downstream of the site requiring a stormwater conveyance that does not currently exist. The stormwater from this site must not adversely affect any adjoining properties. The stormwater management on the site must not adversely affect any properties upstream or downstream of this property." was not addressed.

Performance Agreement and Surety

Gist Street PUD Subdivision.pdf

2. Engineering Sureties

- Any unposted sureties associated with this development from site plan(s) 5948 shall be transferred to this final plat as a condition of approval. No action is necessary from applicant.

(Previous comment restated for informational purposes only, no response necessary.)

Planning

General Comments

3. Existing Conditions

- The applicant shall make the following revisions:

Note number 4 should correctly state the zoning as SD-R (4.71);
Also, the note at the bottom right corner of the page should correctly label the current zoning as SD-R (4.71);
Add the R to the word Residence;
Add that this is within CFCO**-7.**

COF PROJECT 6011 4-6-2016.pdf

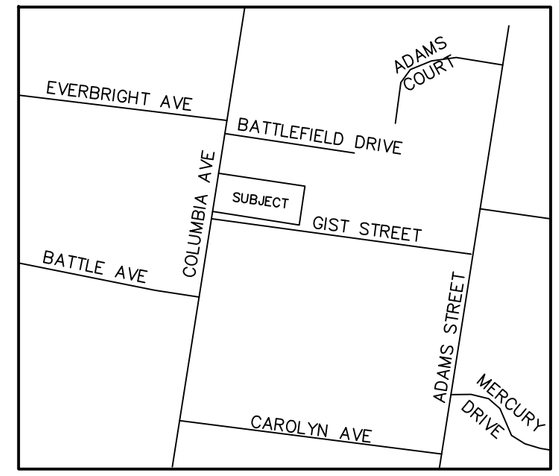
4. Easements

- The applicant shall dimension the ingress/egress easement.

GRAPHIC SCALE 1"=50'

0 50 100 150

N



VICINITY MAP
(NOT TO SCALE)

NOTES

1) THE PURPOSE FOR THIS PLAT IS TO CREATE FOUR LOTS.
2) BEARINGS AS SHOWN ARE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FIPSZONE 4100; NAD 83 DATUM.
3) SUBJECT PARCEL: MAP 78k, PARCEL 19.00 & 19.01
4) SUBJECT PROPERTY ZONED: MGA–1 MUNICIPAL GROWTH 1
5) MINIMUM REQUIRED SETBACKS ARE AS FOLLOWS:
   FRONT 29.5'
   SIDE 5'
   REAR 30'
6) SUBJECT PROPERTY IS NOT LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA PER FIRM MAP NUMBER 47187C0211F, MAP REVISED SEPTEMBER 29, 2006.
7) WITHIN NEW DEVELOPMENTS AND FOR OFF SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES SUCH AS CABLE TEVELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER,TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
8) UTILITIES AS SHOWN WERE TAKEN FROM VISIBLE FIELD LOCATIONS. UTILITY DETAILS AND PRECISE GROUND LOCATIONS SHOULD BE OBTAINED FROM THE PROPER AUTHORITIES BEFORE ANY GROUND DISTURBANCE OR CONSTRUCTION IS STARTED.
9) THE CURRENT OWNER HAS NO KNOWLEDGE OF ANY ENTITY HAVING MINERAL RIGHTS TO THE SUBJECT PROPERTY.
10) THE CITY OF FRANKLIN WATER MANAGEMENT IS NOT RESPONSIBLE FOR ANY DRIVEWAY CROSSINGS.
11) MAINTENANCE OF ALL STORMWATER MANAGEMENT FEATURES SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER(S) OR HOA.
12) LOTS SHALL CONFORM TO ALL REQUIREMENTS OF THE "FRANKLIN ZONING ORDINANCE".
13) ALL SIDEWALKS WITHIN THE PUBLIC ACCESS EASEMENT SHALL BE MAINTAINED BY THE PROPERTY OWNERS AND/ OR THE HOMEOWNERS ASSOCIATION, WHICHEVER APPLIES.

DETACHED RESIDENTIAL LOT TREE CHART

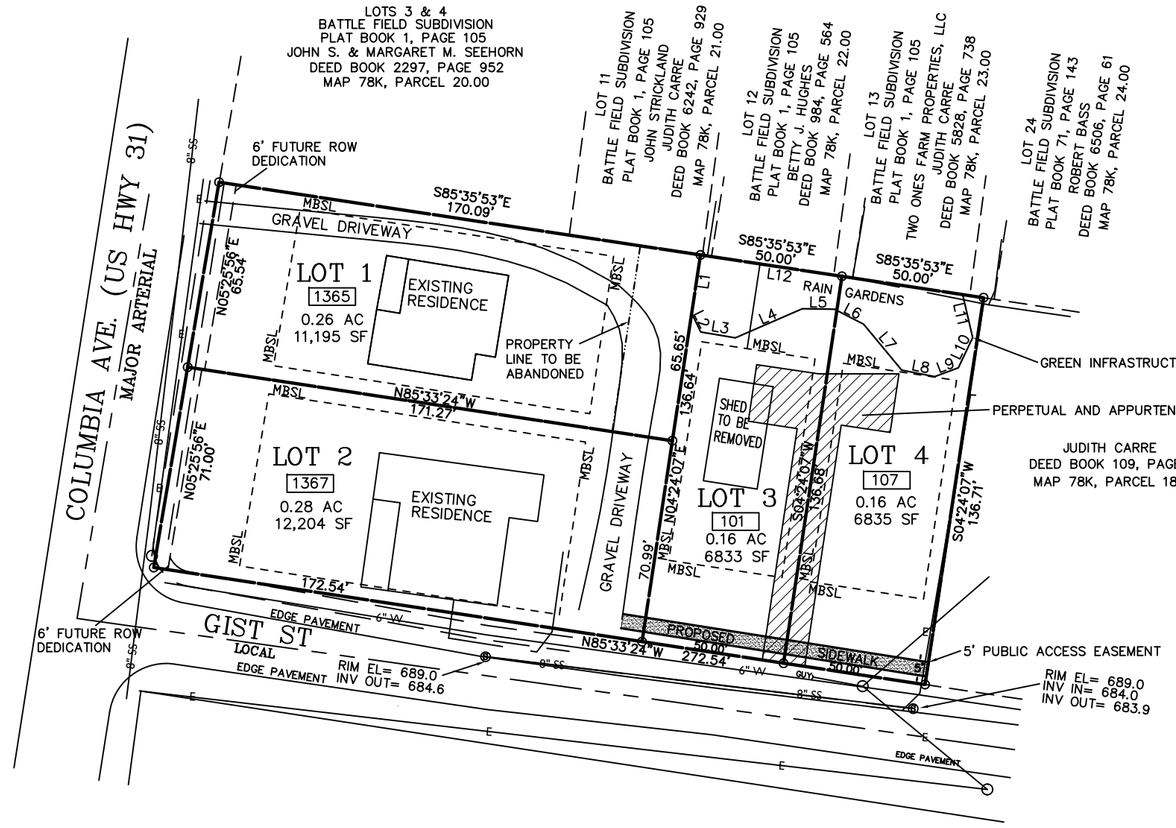
LOT NUMBER	LOT SIZE	CALIPER INCHES	# TREES
LOT 1	11,195 SF	3"	3
LOT 2	12,204 SF	3"	3
LOT 3	6833 SF	3"	2
LOT 4	6835 SF	3"	2

NOTE:
THIS PLAT SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES. BEFORE ANY GROUND DISTURBANCE OR CONSTRUCTION EVENT, DIAL 811, TENNESSEE ONE CALL.

OWNERS INFORMATION:

BOB BASS
204 LEWISBURG PIKE
FRANKLIN, TENNESSEE 37064
PARCEL 19.01 OF MAP 78K
DEED BOOK 6560, PAGE 428, R.O.W.C
PHONE: 615–347–5942
EMAIL: bob.bass@comcast.net

PHILIP & MELISSA WALTON
1230 MOHER BLVD. # 202
FRANKLIN, TENNESSEE 37069
PARCEL 19.00 OF MAP 78K
DEED BOOK 2071, PAGE 944, R.O.W.C
PHONE: 615–566–2241
EMAIL: pwalton37069@yahoo.com



GREEN INFRASTRUCTURE EASEMENT LINE TABLE

LINE	DISTANCE	BEARING
L1	20.68'	S04°16'47"W
L2	7.19'	S29°55'39"E
L3	12.26'	S84°33'56"E
L4	25.55'	N62°19'22"E
L5	11.23'	N86°40'45"E
L6	11.47'	S66°54'46"E
L7	20.80'	S43°47'42"E
L8	11.78'	S83°06'23"E
L9	8.81'	N65°11'18"E
L10	11.66'	N21°06'22"E
L11	15.41'	N17°12'19"W
L12	92.65'	N85°35'28"W

LEGEND

- IRON PIN (SET)
- IRON PIN (FOUND)
- E — ELECTRIC LINE
- G — GAS LINE
- S — SANITARY SEWER LINE
- W — WATER LINE
- (S) SANITARY SEWER MANHOLE
- ORIGINAL PROPERTY LINES
- PROPOSED AND EXISTING PROPERTY LINES

CERTIFICATE OF OWNERSHIP

I(WE) HEREBY CERTIFY THAT I AM(WE ARE) THE OWNER(S) OF THE PROPERTY SHOWN HEREON AS OF RECORD IN BOOK 6560, PAGE 428, & BOOK 2071, PAGE 944, R.O.W.C., TENNESSEE, AND ADOPT THE PLAN OF SUBDIVISION OF THE PROPERTY AS SHOWN HEREON AND DEDICATE ALL PUBLIC WAYS AND EASEMENTS AS NOTED. NO LOT(S) AS SHOWN HEREON SHALL AGAIN BE SUBDIVIDED, RESUSDIVIDED, ALTERED OR CHANGED SO AS TO PRODUCE LESS AREA THAN IS HEREBY ESTABLISHED UNTIL OTHERWISE APPROVED BY THE FRANKLIN MUNICIPAL PLANNING COMMISSION, AND UNDER NO CONDITION SHALL SUCH LOT(S) BE MADE TO PRODUCE LESS AREA THAN IS PRESCRIBED BY THE RESTRICTIVE COVENANTS AS OF RECORD IN BOOK PAGE , R.O.W.C., TENNESSEE, RUNNING WITH THE TITLE TO THE PROPERTY. I (WE) FURTHER CERTIFY THAT THERE ARE NO LIENS ON THIS PROPERTY, EXCEPT AS FOLLOWS: BOOK , PAGE , R.O.W.C.

OWNER: DATE

OWNER: DATE

OWNER: DATE

OWNER: DATE

CERTIFICATE OF SURVEY

I HEREBY CERTIFY THAT THE SUBDIVISION PLAT AS SHOWN HEREON IS CORRECT AND THAT ALL OF THE MONUMENTS SHOWN HEREON HAVE BEEN PLACED AS INDICATED. THIS SUBDIVISION PLAT CORRECTLY REPRESENTS A SURVEY MADE UNDER MY SUPERVISION ON MARCH 3, 2016

SURVEYOR TENN. LICENSE NO. 1859 DATE MARCH 3, 2016

CERTIFICATE OF APPROVAL FOR RECORDING

APPROVED BY THE FRANKLIN MUNICIPAL PLANNING COMMISSION, FRANKLIN, WILLIAMSON COUNTY, TENNESSEE, WITH THE EXCEPTION OF SUCH CONDITIONS, IF ANY, AS ARE NOTED IN THE PLANNING COMMISSION MINUTES FOR THE DAY OF , 2015, AND THIS PLAT HAS BEEN APPROVED FOR RECORDING IN THE REGISTER'S OFFICE OF WILLIAMSON COUNTY.

SECRETARY DATE
FRANKLIN, MUNICIPAL PLANNING COMMISSION.

CERTIFICATE OF APPROVAL OF WATER AND SEWER SYSTEMS

I HEREBY CERTIFY THAT:
(1) THE WATER AND SEWER SYSTEMS DESIGNATED IN "GIST STREET PUD SUBDIVISION" HAVE BEEN INSTALLED IN ACCORDANCE WITH CITY SPECIFICATIONS, OR
(2) A PERFORMANCE BOND IN THE AMOUNT OF $ FOR THE WATER SYSTEM AND $ FOR THE SEWER SYSTEM HAS BEEN POSTED WITH THE CITY OF FRANKLIN, TO ASSURE COMPLETION OF SUCH SYSTEMS. AND REQUIRED IMPROVEMENTS IN CARE OF DEFAULT.

DIRECTOR WATER MANAGEMENT DEPARTMENT DATE
CITY OF FRANKLIN, TENNESSEE.

CERTIFICATE OF APPROVAL OF SUBDIVISION NAME, STREETS,AND ADDRESSING

SUBDIVISION NAME AND STREET NAMES APPROVED BY THE WILLIAMSON COUNTY EMERGENCEY MANAGEMENT AGENCY.

WILLIAMSON COUNTY EMERGENCY MANAGEMENT AGENCY DATE

CITY OF FRANKLIN DATE

CERTIFICATE OF APPROVAL OF STREETS, DRAINAGE, AND SIDEWALKS

I HEREBY CERTIFY THAT:
(1) THE STREETS, DRAINAGE, AND SIDEWALKS DESIGNATED IN GIST STREET PUD SUBDIVISION HAVE BEEN INSTALLED IN ACCORDANCE WITH CITY SPECIFICATIONS, OR
(2) A PERFORMANCE AGREEMENT AND SURETY IN THE AMOUNT OF $ FOR STREETS, $ FOR DRAINAGE, AND $ FOR SIDEWALKS HAS BEEN POSTED WITH THE CITY OF FRANKLIN, TENNESSEE TO ASSURE COMPLETION OF SUCH IMPROVEMENTS.

DIRECTOR, STREETS DEPARTMENT DATE
CITY OF FRANKLIN, TENNESSEE

ARROWHEAD SURVEY
4151 OLD HILLSBORO ROAD
FRANKLIN, TN 37064
mark@arrowheadsurvey.com
615-599-7347

CURRENT ZONING:
R–3, RESIDENTIAL
CAO–2 COLUMBIA AVENUE OVERLAY
TRADITIONAL
SINGLE FAMILY ESIDENCE
CFCO

GIST STREET PUD SUBDIVISION FINAL PLAT

COF PROJECT #6011

TOTAL ACRES = .85	TOTAL LOTS = 4
FEET NEW STREETS =0.00	ACRES NEW STREETS = 0.00
PARCELS 19.00 & 19.01 OF TAX MAP 78K	GROUP B
CITY OF FRANKLIN, WILLIAMSON COUNTY, TENNESSEE	
9TH COUNCIL DISTRICT	SHEET 1 OF 1
DATE: 04/06/2016 | SCALE: 1"= 50'	CLOSURE: 1/10,000

COF no: 6059

CONDITIONS OF APPROVAL:

Performance Agreement and Surety

General Comments

1. Engineering Sureties

- Sureties for this final plat were posted with the original final plat. There are no further sureties associated with this plat.

(Previous comment restated for informational purposes only, no response necessary.)

Planning

General Comments

2. Project number

- Number not correct, revise to 6059.

3. Owner affidavit

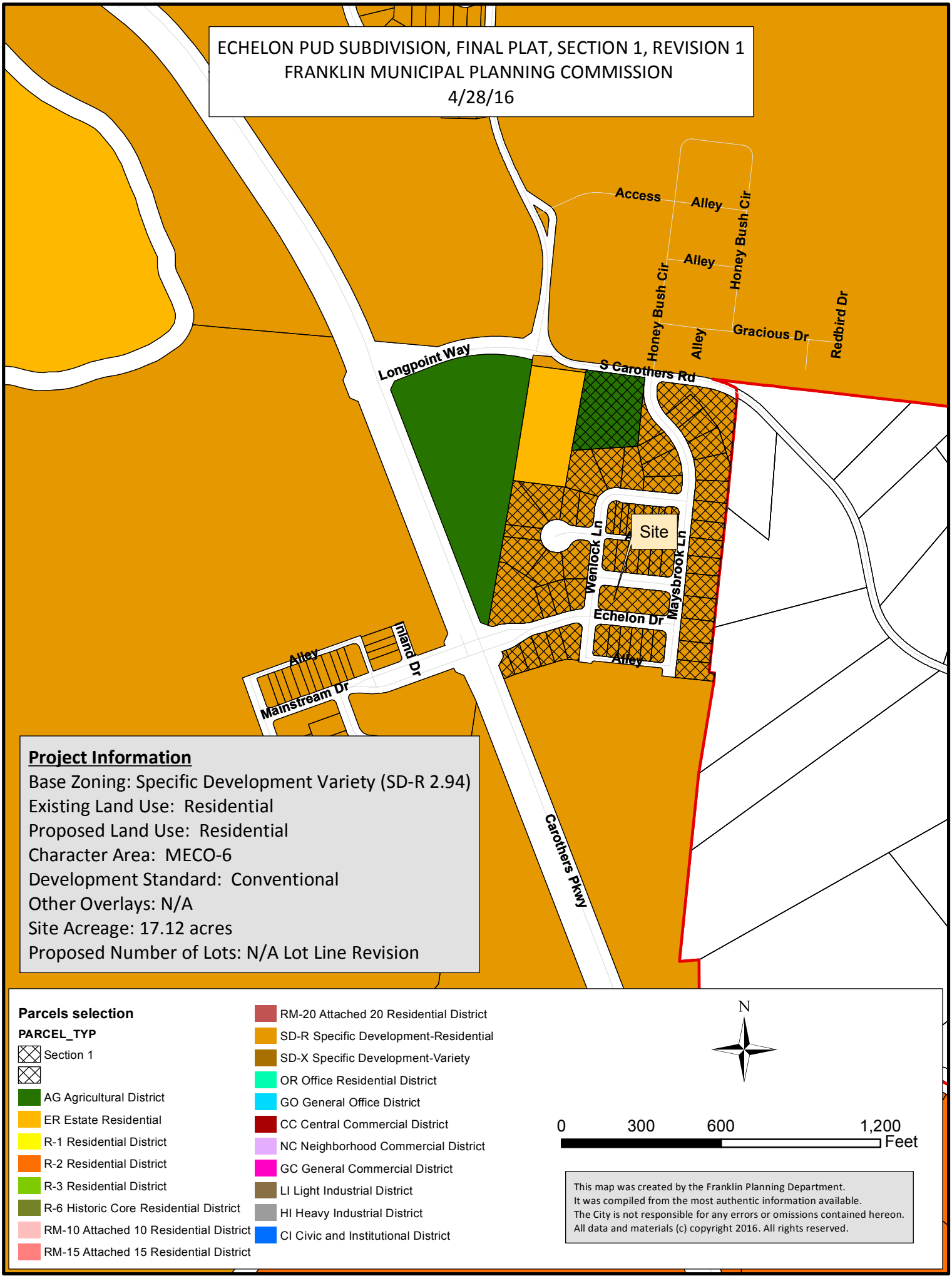
- Owner affidavit is not filled out.

Planning (Landscape)

General Comments

4. Open Space lots

- All shall be numbered.


ECHELON PUD SUBDIVISION, FINAL PLAT, SECTION 1, REVISION 1
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/16
Access
Alley
Honey Bush Cir
Alley
Honey Bush Cir
Alley
Gracious Dr
Redbird Dr
Longpoint Way
S Carothers Rd
Site
Wenlock Ln
Maysbrook Ln
Echelon Dr
Alley
Alley
Mainstream Dr
Carothers Pkwy
Project Information
Base Zoning: Specific Development Variety (SD-R 2.94)
Existing Land Use: Residential
Proposed Land Use: Residential
Character Area: MECO-6
Development Standard: Conventional
Other Overlays: N/A
Site Acreage: 17.12 acres
Proposed Number of Lots: N/A Lot Line Revision
Parcels selection
PARCEL_TYP
Section 1
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
300
600
1,200
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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Notes

1. The purpose of this plat is to revise the lot lines for lots 59-68.
2. The entire property is located within Zone "X" (Areas determined to be outside the 0.2% annual chance floodplain) on Fema Firm Community Panel No. 47187C0214 F, September 29, 2006.
3. The lots shall be served by public water from Milcrofton Utility District and sewer from the City of Franklin. Individual water and/or sanitary sewer service lines are required for each parcel.
4. Parcel ID's shown thus (000) pertain to property map 089.
5. All property corners not designated otherwise shall be marked with 1/2" iron rods x 18" long with plastic caps.
6. Bearings based on Tennessee Grid, NAD 83.
7. Within new development and for off-site lines constructed as a result of, or to provide service to, the new development, all utilities, such as cable television, electrical (excluding transformers), gas, sewer, telephone and water lines shall be placed underground.
8. All street light locations and quantities are approximate. Final positioning and quantity shall be at direction of MTEMC.
9. All open space area to be public utility and drainage easements (PUDEs).
10. The property owner(s) or Homeowner's association will maintain all open space, landscape and stormwater management feature areas, detention/retention areas, and all sidewalks and pathways located outside public rights-of-way. All roadways shall be public streets constructed to the City of Franklin specifications in public rights-of-way.
11. All Milcrofton Utility District (M.U.D.) easements shown are exclusive easements. No excavation, building, structure or obstruction of any kind shall be constructed or permitted within the easements except for the installation of pavement for private or public driveways which cross an easement. No trees or shrubbery will be planted within the utility and drainage easements.
12. Lots shall conform to all the requirements of the Franklin Zoning Ordinance.
13. There shall be a minimum of 10' between buildings.
14. Any and all mineral rights for the subject property shall transfer to the owner.
15. Residential fire sprinklers systems shall be provided if 1,500 gpm / 20 psi is not available.
16. Greenway Easement Note: The 95' wide all access public easement located on the east side of Carothers Parkway shall be dedicated at the time of Final Plat for Section 2, approximately 2016. The 95' easement located west of Carothers Parkway shall be dedicated at the time of the Final Plat for Section 4, approximately 2018.
17. No obstructions or encroachments which impede the flow of stormwater shall be permitted within Public Drainage Easements between lots. The City of Franklin is not responsible for repair or replacement of any encroachments that are damaged or removed in the course of maintenance activity within easements.

Site Data

Project Name:	Echelon Subdivision - Section 1, Revision 1
COF Project #	6509
Subdivision	Echelon
Lot numbers:	Lots 13-47 & Lots 59-79
Address:	South Carothers Road
City:	Franklin
County:	Williamson
State:	Tennessee
Civil District:	14th
Existing zoning and charter area overlay:	SD-R (Specific Development-Residential) - MECO-6
Other applicable overlays:	N/A
Applicable development standard:	Conventional
Acreage of site:	17.12
Approved Density:	SD-R 2.94
Minimum required setback lines:	Manor Lots (Lots 13-39)
Yard fronting on any street:	15 Feet
Side yard:	5 Feet
Rear yard:	10 Feet
Minimum required setback lines:	Garden Lots (40-47)
Yard fronting on any street:	8 Feet
Side yard:	5 Feet
Rear yard:	10 Feet
Minimum required setback lines:	Cottage Lots (Lots 69-79)
Yard fronting on any street:	8 Feet
Side yard:	5 Feet
Rear yard:	4 Feet
Minimum required setback lines:	Townhome Lots (59-68)
Yard fronting on any street:	8 Feet
Side yard:	5 Feet
Rear yard:	4 Feet (4 Feet for attached units)
Owners representative:	Crescent Helm, LLC
Address:	227 W. Trade Street, Suite 1000
	Charlotte, NC 28202
Phone number:	615.312.8242
Email address:	kpascarella@pearlstreetpartners.com
Contact name:	Khris Pascarella
Applicant:	Edge Planning, Landscape Arch. & Graphic Design
Address:	210 12th Avenue S, Suite 202 - Nashville, Tn 37203
Phone number:	(615) 250-8154
Fax number:	(615) 250-8155
Email address:	jhaas@edgela.com
Contact name:	John Haas
Engineer / Land Surveyor:	Energy Land & Infrastructure
Address:	1420 Donelson Pike, Suite A12 Nashville, TN 37217
Phone number:	(615 383-6300
Fax number:	(615) 383-6341
Contact names:	Michael Ray

* Some items such as building square footage, building height, parking requirements, etc. are not included in the Site Data Chart due to the nature of this project. Parkland dedication is not applicable due to the date of Concept Plan approval for this Project.

Detached Residential Lot Tree Chart

Lot	Area (Sq. Ft./Acres)	Cal.	# Trees
13	9,042/0.21	2"	3
14	9,119/0.21	2"	3
15	10,607/0.24	2"	6
16	10,610/0.24	2"	6
17	10,619/0.24	2"	6
18	8,377/0.19	2"	3
19	8,383/0.19	2"	3
20	8,389/0.19	2"	3
21	9,397/0.22	2"	3
22	9,946/0.23	2"	3
23	11,935/0.27	2"	6
24	10,871/0.25	2"	6
25	9,396/0.22	2"	3
26	8,227/0.19	2"	3
27	9,155/0.21	2"	3
28	11,090/0.25	2"	6
29	8,652/0.20	2"	3
30	11,548/0.27	2"	6
31	13,224/0.30	2"	6
32	19,108/0.44	2"	6
33	7,860/0.18	2"	3
34	8,132/0.19	2"	3
35	13,999/0.32	2"	6
36	16,775/0.39	2"	6
37	16,896/0.39	2"	6
38	12,619/0.29	2"	6
39	13,121/0.30	2"	6
40	7,897/0.18	2"	3
41	7,209/0.17	2"	3
42	6,240/0.14	2"	3
43	5,412/0.12	2"	3
44	5,906/0.14	2"	3
45	6,498/0.15	2"	3
46	6,278/0.14	2"	3
47	8,611/0.20	2"	3
59	3,854/0.09	2"	3
60	2,930/0.07	2"	3
61	2,880/0.07	2"	3
62	2,880/0.07	2"	3
63	3,503/0.08	2"	3
64	3,510/0.08	2"	3
65	2,880/0.07	2"	3
66	2,880/0.07	2"	3
67	2,949/0.07	2"	3
68	3,919/0.09	2"	3
69	5,653/0.13	2"	3
70	5,106/0.12	2"	3
71	5,183/0.12	2"	3
72	5,028/0.12	2"	3
73	5,261/0.12	2"	3
74	5,619/0.13	2"	3
75	5,008/0.11	2"	3
76	4,980/0.11	2"	3
77	4,980/0.11	2"	3
78	4,980/0.11	2"	3
79	5,648/0.13	2"	3
O/S 1	31,433/0.72	-	-
O/S 2	7,677/0.18	-	-
O/S 3	33,818/0.78	-	-
O/S 4	24,270/0.56	-	-
O/S 5A	6,253/0.14	-	-
O/S 6	3,462/0.08	-	-
O/S 12	6,195/0.14	-	-

Legend

- FH — Fire Hydrant
- W — Water Line
- S — Sewer Line
- (S) — Sewer Manhole
- Iron Rod (New)
- Monument (New)
- Proposed Stormwater Inlet
- Concrete Sidewalk
- (1) — Lot Number

Total area: 745,642 S.F. or 17.12 Acres

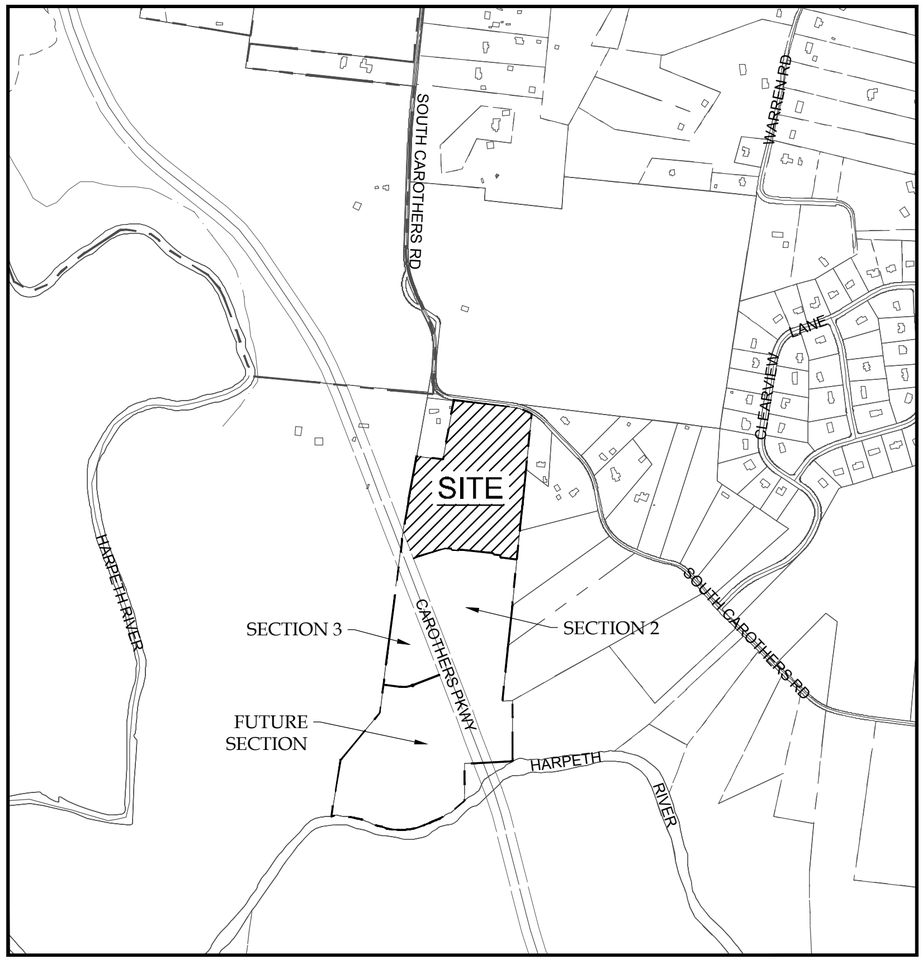
Road Data:

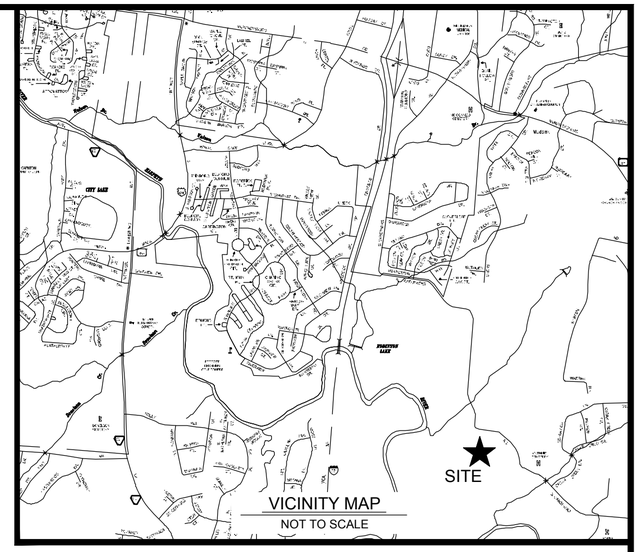
Acreage in new roads	4.40 Acres
Linear footage of new roads	3,334 Feet
Linear footage of alleys	634 Feet

GRAPHIC SCALE (IN FEET)
800 0 800 1600
1 inch = 800ft.

N

TN STATE PLANE
ZONE 5301, FIPSZONE 4100
NAD 83 DATUM





Certificate Of Ownership

I (we) hereby certify that I am (we are) the owner(s) of the property shown hereon as of record in Deed Book 5791, Page 574, R.O.W.C., Tennessee and that I (we) hereby adopt this plan of subdivision of the property as shown hereon and dedicate all public ways and easements as noted. No lot or lots as shown hereon shall again be subdivided, re-subdivided, altered or changed so as to produce less area than is hereby established until otherwise approved by the Franklin Municipal Planning Commission and under no condition shall such lot or lots be made to produce less area than is prescribed by the restrictive covenants as of record in Book _____ , Page _____ , R.O.W.C., Tennessee, running with the title to the property. I (we) further certify that there are no liens on this property, except as follows: Deed of Trust Book 5869, Page 123, R.O.W.C., Tennessee.

Owner _____ Date _____

Owner Information
Khris Pascarella
Crescent Helm, LLC
227 W. Trade Street, Suite 1000
Charlotte, NC 28202
Phone: 615-312-8242
Email: kpascarella@pearlstreetpartners.com

Certificate Of Approval of Subdivision Name, Street Names, and Addressing

Subdivision name and street names approved by the Williamson County Emergency Management Agency.

Williamson County Emergency Management Agency _____ Date _____

City of Franklin _____ Date _____

Certificate Of Approval of Sewer Systems

I hereby certify that:

(1) The sewer system designated in Echelon Subdivision - Section 1 has been installed in accordance with City specifications, or

(2) A performance agreement and surety in the amount of $ _____ for the sewer system has been posted with the City of Franklin, Tennessee, to assure completion of such systems.

Director, Water Management Department _____ Date _____
City of Franklin, Tennessee

Utility Disclaimer

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Tennessee811 Know what's below. Call before you dig.

Certificate Of Approval for Recording

Approved by the Franklin Municipal Planning Commission, Franklin, Williamson County, Tennessee, with the exception of such conditions, if any, as are noted in the Planning Commission minutes for the _____ day of _____, 20 ___ , and this plat has been approved for recording in the Register's Office of Williamson County.

Secretary, Franklin Municipal Planning Commission _____ Date _____

Certificate Of Approval of Streets, Drainage, and Sidewalks

I hereby certify that:

(1) the streets, drainage, and sidewalks designated in Echelon Subdivision - Section 1 has been installed in accordance with City specifications, or

(2) a performance agreement and surety in the amount of $ _____ for streets, $ _____ for drainage, and $ _____ for sidewalks has been posted with the City of Franklin, Tennessee, to assure completion of such improvements.

Director, Streets Department _____ Date _____
City of Franklin, Tennessee

Certificate Of Approval of Water

I hereby certify that:

(1) The water system designated in Echelon Subdivision - Section 1 has been installed in accordance with City specifications, or

(2) A performance agreement and surety in the amount of $ _____ for the water system has been posted with the Milcrofton Utility District to assure completion of such improvements.

General Manager, Milcrofton Utility District _____ Date _____

Certificate Of Survey

I (we) hereby certify that the subdivision plat as shown hereon is correct and that all of the monuments shown hereon will be placed as indicated upon completion of construction. This subdivision plat correctly represents a survey prepared by Gresham, Smith and Partners.

Surveyor Information
Mike Dial
ELI, LLC
1420 Donelson Pike, Suite A12
Nashville, Tn 37217
Phone: 615-383-6300
Email: mike.dial@eli-llc.com

ARTHUR M. DIAL REGISTERED LAND SURVEYOR XVI AGRICULTURE COMMISSION TENNESSEE NO. 2471 4/7/16

ECHELON PUD SUBDIVISION
SECTION 1, REVISION 1
SHEET 1 OF 4

14th CIVIL DISTRICT
TAX MAP 089, PART OF PARCEL 50.01
FRANKLIN, WILLIAMSON COUNTY, TENNESSEE
CITY OF FRANKLIN PROJECT #6509
DATE: 02-23-2016
REVISED: 04-07-2016

ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A12 • NASHVILLE, TN 37217
OFFICE 615-383-6300 • WWW.ELI-LLC.COM
ENGINEERS•SURVEYORS•INFRASTRUCTURE•ENVIRONMENTAL

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TN STATE PLANE
ZONE 5301, FIPSZONE 4100
NAD 83 DATUM

GRAPHIC SCALE (IN FEET)
50 0 50 100
1 inch = 50 ft.

JAMES R. SOUTHERLAND
DEED BOOK 1645, PAGE 827
TAX MAP 89, PARCEL 51.00

HENRY M. SMALL
DEED BOOK 774, PAGE 756
TAX MAP 89, PARCEL 51.01

JOHN T. HELM, IV
AND ELLEN HELM SACCHI
DEED BOOK 5637 PAGE 726, TAX MAP 89
PARCEL 50.02

Legend

- FH — Fire Hydrant
- W — Water Line
- S — Sewer Line
- (S) — Sewer Manhole
- ● — Iron Rod (New)
- ■ — Monument (New)
- Proposed Stormwater Inlet
- Concrete Sidewalk
- (1) — Lot Number

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Tennessee 811
Know what's below. Call before you dig.

ARTHUR M. DIAL
REGISTERED LAND SURVEYOR
TENNESSEE NO. 2471
4/7/16

ECHELON PUD SUBDIVISION
SECTION 1, REVISION 1
SHEET 2 OF 4

14th CIVIL DISTRICT
TAX MAP 089, PART OF PARCEL 50.01
FRANKLIN, WILLIAMSON COUNTY, TENNESSEE
CITY OF FRANKLIN PROJECT #6509
DATE: 02-23-2016
REVISED: 04-06-2016

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N

TN STATE PLANE
ZONE 5301, FIPSZONE 4100
NAD 83 DATUM

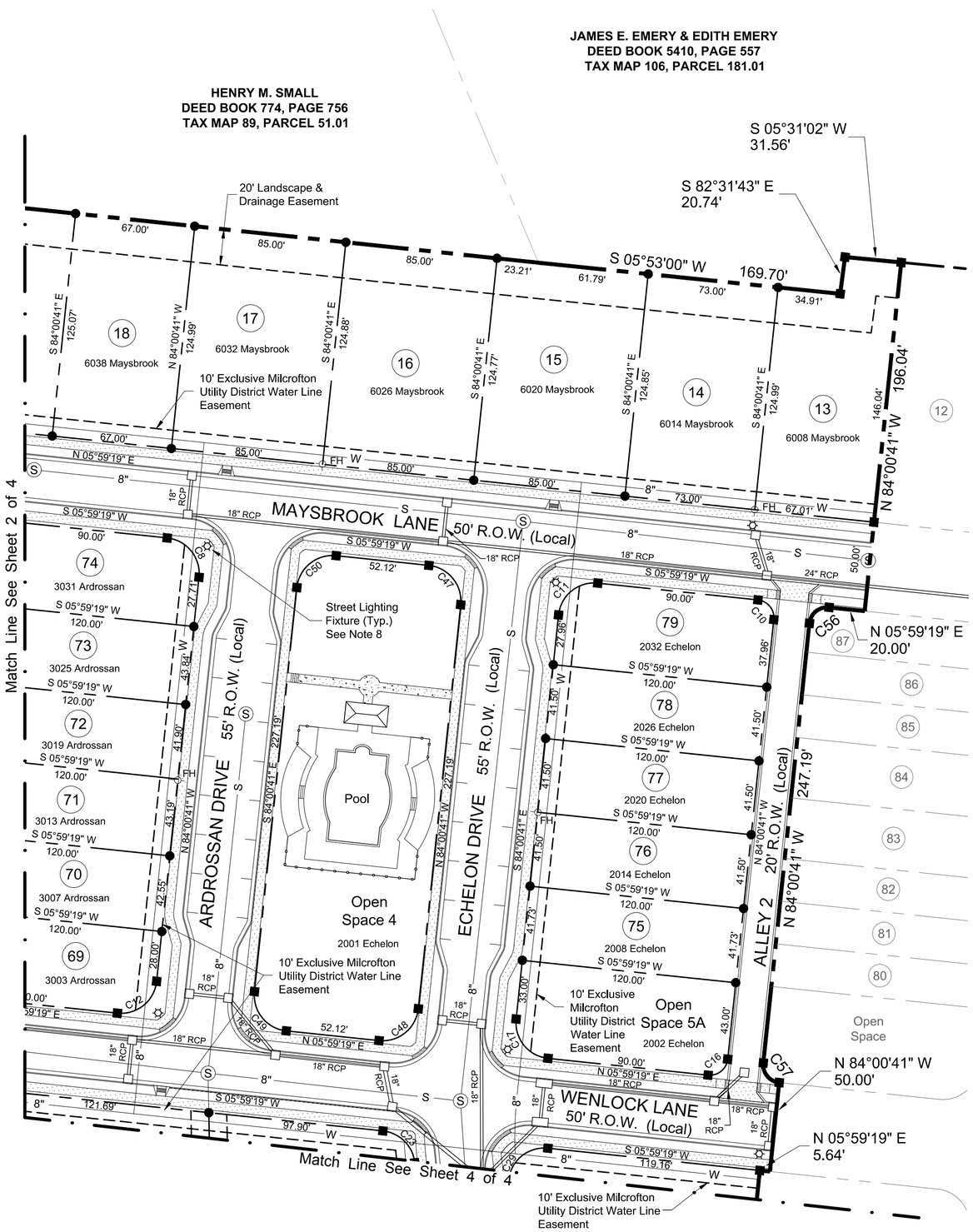
GRAPHIC SCALE (IN FEET)
50 0 50 100
1 inch = 50 ft.

Legend

- FH — Fire Hydrant
- W — Water Line
- S — Sewer Line
- (S) — Sewer Manhole
- Iron Rod (New)
- Monument (New)
- Proposed Stormwater Inlet
- Concrete Sidewalk
- (1) — Lot Number

Curve Data Chart

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C2	10.00'	15.71'	14.14'	N 39°00'41" W	90°00'00"
C3	30.00'	47.12'	42.43'	N 50°59'19" E	90°00'00"
C4	150.00'	2.98'	2.98'	N 72°53'37" E	1°08'13"
C5	10.00'	15.71'	14.14'	S 50°59'19" W	90°00'00"
C6	20.00'	31.42'	28.28'	S 39°00'41" E	90°00'00"
C7	150.00'	38.16'	38.06'	N 65°02'14" E	14°34'33"
C8	20.00'	31.42'	28.28'	S 50°59'19" W	90°00'00"
C9	10.00'	15.71'	14.14'	S 39°00'41" E	90°00'00"
C10	10.00'	15.71'	14.14'	S 50°59'19" W	90°00'00"
C11	20.00'	31.42'	28.28'	S 39°00'41" E	90°00'00"
C12	20.00'	31.42'	28.28'	N 39°00'41" W	90°00'00"
C13	10.00'	15.71'	14.14'	N 50°59'19" E	90°00'00"
C14	150.00'	20.57'	20.55'	N 61°40'39" E	7°51'23"
C15	62.00'	46.05'	45.00'	S 05°59'19" W	42°33'26"
C16	10.00'	15.71'	14.14'	N 39°00'41" W	90°00'00"
C17	20.00'	31.42'	28.28'	N 50°59'19" E	90°00'00"
C18	150.00'	20.57'	20.55'	N 69°32'02" E	7°51'23"
C19	325.00'	25.88'	25.87'	S 75°44'36" W	4°33'45"
C20	175.00'	151.09'	146.44'	S 18°37'38" E	49°28'08"
C21	80.00'	40.62'	40.19'	S 20°32'08" W	29°05'37"
C22	20.00'	31.42'	28.28'	S 50°59'19" W	90°00'00"
C23	20.00'	27.25'	25.19'	S 45°01'06" W	78°03'33"
C24	325.00'	34.17'	34.15'	S 81°02'10" W	6°01'25"
C25	38.00'	22.48'	22.16'	N 67°03'38" W	33°54'05"
C26	62.00'	33.78'	33.37'	N 65°43'10" W	31°13'07"
C27	300.00'	25.02'	25.01'	N 40°58'22" W	4°46'40"
C28	275.00'	30.10'	30.08'	N 76°35'51" E	6°16'16"
C29	20.00'	37.09'	32.00'	S 47°08'21" E	106°15'20"
C30	20.00'	31.42'	28.28'	S 50°59'19" W	90°00'00"
C31	250.00'	33.99'	33.96'	S 02°05'37" W	7°47'25"
C32	250.00'	73.24'	72.98'	S 34°58'07" E	16°47'09"
C33	300.00'	63.79'	63.67'	N 32°29'33" W	12°10'59"
C34	300.00'	22.21'	22.20'	N 03°52'06" E	4°14'27"
C35	300.00'	71.40'	71.23'	N 19°34'58" W	13°38'10"
C36	250.00'	108.10'	107.26'	S 14°11'19" E	24°46'28"
C37	300.00'	75.99'	75.78'	N 05°30'30" W	14°30'45"
C38	62.00'	59.56'	57.29'	S 79°35'06" E	55°02'18"
C39	62.00'	44.84'	43.87'	N 52°10'34" E	41°26'23"
C40	38.00'	42.80'	40.57'	N 63°43'21" E	64°31'57"
C41	20.00'	31.42'	28.28'	S 39°00'41" E	90°00'00"
C42	80.00'	40.03'	39.62'	S 81°39'09" W	28°40'21"
C43	62.00'	42.20'	41.39'	S 79°10'17" W	38°59'59"
C44	62.00'	35.06'	34.60'	S 43°28'10" W	32°24'15"
C45	62.00'	39.80'	39.12'	S 33°40'40" E	36°46'33"
C46	80.00'	45.01'	44.42'	S 51°11'57" W	32°14'02"
C47	20.00'	31.42'	28.28'	S 50°59'19" W	90°00'00"
C48	20.00'	31.42'	28.28'	N 39°00'41" W	90°00'00"
C49	20.00'	31.42'	28.28'	N 50°59'19" E	90°00'00"
C50	20.00'	31.42'	28.28'	S 39°00'41" E	90°00'00"
C51	125.00'	107.92'	104.60'	N 18°37'38" W	49°28'08"
C52	20.00'	31.82'	28.57'	N 51°41'29" E	91°10'07"
C53	325.44'	125.25'	124.48'	S 68°39'06" E	22°03'04"
C54	150.00'	41.14'	41.01'	S 81°19'06" W	15°42'46"
C55	150.00'	41.14'	41.01'	S 81°19'06" W	15°42'46"
C56	10.00'	15.71'	14.14'	S 39°00'41" E	90°00'00"
C57	10.00'	15.71'	14.14'	N 50°59'19" E	90°00'00"
C58	349.23'	140.56'	139.62'	S 70°58'29" E	23°03'41"



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ARTHUR M. DIAL
REGISTERED LAND SURVEYOR
TENNESSEE NO. 2411
4/7/16

ECHELON PUD SUBDIVISION
SECTION 1, REVISION 1
SHEET 3 OF 4

14th CIVIL DISTRICT
TAX MAP 089, PART OF PARCEL 50.01
FRANKLIN, WILLIAMSON COUNTY, TENNESSEE
CITY OF FRANKLIN PROJECT #6509
DATE: 02-23-2016
REVISED: 04-06-2016

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GRAPHIC SCALE (IN FEET)
50 0 50 100
1 inch = 50 ft.

N

TN STATE PLANE
ZONE 5301, FIPSZONE 4100
NAD 83 DATUM

Match Line See Sheet 2 of 4

Match Line See Sheet 3 of 4

OBREE COURT
50' R.O.W. (Local)

ECHELON DRIVE
50' R.O.W. (Local)

PROPOSED CAROTHERS PARKWAY
(COLLECTOR)
CITY OF FRANKLIN
DEED BOOK 4971, PAGE 337

CAROTHERS LAND CO., LLC.
DEED BOOK 4740, PAGE 414
TAX MAP 89, PARCEL 49.00

33 104 Obree
34 110 Obree
35 116 Obree
36 122 Obree
37 123 Obree
38 111 Obree
39 105 Obree
40 1035 Echelon
41 1029 Echelon
42 1023 Echelon
43 1004 Echelon
44 1010 Echelon
45 1016 Echelon
46 1022 Echelon
47 1028 Echelon
48
49
50

Open Space 12
Open Space 3 (Detention) 1011 Echelon
Open Space 6

10' Exclusive Milcrofton Utility District Water Line Easement
10.6' Maximum Depth on Sanitary Sewer line
20' Sanitary Sewer Easement
37.5' Incompatible Use Buffer
45' Access Easement
25' Incompatible Use Buffer
5' Storm Sewer Easement
10' Storm Sewer Easement
Street Lighting Fixture (Typ.) See Note 8
Slope Easement
Permanent Drainage Easement
40' Proposed Utility Easement (By Others)
Proposed 16' Water Line (By Others)

S 74°15'00" E 131.16' 73.15'
N 05°59'19" E 131.30'
S 82°48'45" E 196.86' 175.04'
N 08°33'12" E 124.38' 58.01' 2.63'
N 30°19'42" W 30.70'
N 38°07'09" W 160.39'
N 84°00'41" W 42.00'
S 84°00'41" E 19.98'
N 88°52'11" E 86.97'
S 11°58'32" E 121.41'
S 05°04'30" E 102.34'
N 73°27'43" E 64.79' 90.48'
S 16°32'17" E 120.00'
N 16°32'17" W 120.00'
N 37°56'03" E 127.94'
S 84°00'41" E 139.01'
N 84°00'41" W 141.98'
N 57°03'27" W 68.30' 158.78' 90.48'
N 09°45'50" E 552.22' 168.12' 45.10' 96.23'
N 80°14'10" W 25.00'
242.78'
S 72°40'11" W 20.67'
N 21°06'03" W 120.00'
S 73°27'43" W 52.00'
N 73°27'43" E 52.00'
S 16°32'17" E 123.96' 39.93' 4.01'
N 16°35'35" W 120.04' 3.52'
S 18°53'39" E 119.28' 51.66'
S 18°53'39" E 106.80' 32.61'
N 57°44'38" E 18.31'
S 21°06'03" E 97.04'
N 73°27'43" E 12.71' 9.97'
N 84°00'41" W 43.94'
S 78°36'03" W 27.10'
S 73°27'43" W 17.67'
S 72°50'52" W 159.15' 52.02'
S 68°42'20" W 45.01' 51.95'
N 21°05'38" W 53.45'
N 28°28'57" E 38.56'
N 70°41'02" W 16.08'

Legend

- FH — Fire Hydrant
- W — Water Line
- S — Sewer Line
- S — Sewer Manhole
- Iron Rod (New)
- Monument (New)
- Proposed Stormwater Inlet
- Concrete Sidewalk
- 1 — Lot Number

Utility Disclaimer

Energy, Land and Infrastructure, LLC (ELI, LLC) has not physically located the underground utilities. Above grade and underground utilities shown were taken from visible appurtenances at the site, public records and/or maps prepared by others. ELI, LLC makes no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. ELI, LLC further does not warrant that the underground utilities are in the exact location indicated. Therefore, reliance upon the type, size and location of utilities shown should be done so with this circumstance considered. Detailed verification of existence, location and depth should also be made prior to any decision relative thereto is made. Availability and cost of service should be confirmed with the appropriate utility company. In Tennessee, it is a requirement, per "The Underground Utility Damage Prevention Act", that anyone who engages in excavation must notify all known underground utility owner, no less than three (3) nor more than ten (10) working days prior to the date of their intent to excavate and also to avoid any possible hazard or conflict. Tennessee One Call 811.

Tennessee 811
Know what's below. Call before you dig.

ARTHUR M. DIAL
REGISTERED LAND SURVEYOR
TENNESSEE NO. 2411
4/7/16

ECHELON PUD SUBDIVISION
SECTION 1, REVISION 1
SHEET 4 OF 4

14th CIVIL DISTRICT
TAX MAP 089, PART OF PARCEL 50.01
FRANKLIN, WILLIAMSON COUNTY, TENNESSEE
CITY OF FRANKLIN PROJECT #6509
DATE: 02-23-2016
REVISED: 04-06-2016

ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A12 • NASHVILLE, TN 37217
OFFICE 615-383-6300 • WWW.ELI-LLC.COM
ENGINEERS•SURVEYORS•INFRASTRUCTURE•ENVIRONMENTAL

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N

GRAPHIC SCALE (IN FEET)
20 0 10 20 40
1 inch = 20 ft.

WENLOCK LANE 50' R.O.W. (Local)

MAYSBROOK LANE 50' R.O.W. (Local)

OBREE COURT
50' R.O.W. (Local)

ALLEY 1 20' R.O.W (Local)

Utility Boxes (pull box)
Sewer Service
Gas Service
Telephone Box
Telephone Pedestal
ELECT STUB
ELECTRIC TRANSFORMER
Unknown
WM

Lot	Width	Depth
59	33'	125'
60	73'	120'
61	24'	120'
62	24'	120'
63	29'	120'
64	29'	120'
65	24'	120'
66	24'	120'
67	32'	125'
68		95'

PROPOSED LOT LINE REVISIONS

ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A12 • NASHVILLE, TN 37217
OFFICE 615-383-6300 • WWW.ELI-LLC.COM
ENGINEERS • SURVEYORS • INFRASTRUCTURE • ENVIRONMENTAL

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ECHELON
SECTION 1 LOT LINE REVISION EXHIBIT
FINAL PLAT CITY OF FRANKLIN PROJECT NO. 5824
FRANKLIN, TENNESSEE

Rev.	Date	Revision Description

Issue Date: February 17, 2016
ELI Project No: BN 8236
Drafted By: LCW
Checked By: LCW

Sheet Title:

Sheet No.

Filename: W:\8236 BN Helm Property\CAD\Final Plats\Section 1\Exhibit\Echelon, Section 1 Lot Line Revisions Exhibit.dwg
Layout: Lot Line Revisions
Plotted: Wednesday, February 17, 2016 - 1:10 pm
By: clayw

COF no: 6081

CONDITIONS OF APPROVAL:

Parks

General Comments

1. Parkland information

- Parks:There is no mention of the Parkland information on the Plat that I can find. Please place unit count and square footage in a note on the plat.

2. parkland dedication

- Parks-This plat can not be recorded until the fees are paid.

Performance Agreement and Surety

General Comments

3. Engineering Sureties

-

Any unposted sureties associated with this development from site plan(s) 4715 shall be transferred to this final plat as a condition of approval. No action is necessary from applicant.

(Previous comment restated for informational purposes only, no response necessary.)

Planning

General Comments

4. Open space lots

- Applicant must include Open Space lots within the lot table with associated lot number.

5. One-Stop Procedure

- Due to the applicant's diligence in addressing staff comments and resolving most issues prior to resubmittal, this project is eligible for the One-Stop Post-PC review process. To participate in the One-Stop Post-PC process, the applicant must submit complete and corrected plans electronically through the IDT online review system by the scheduled One-Stop review date and be present at the One-Stop Center on the scheduled date and time that the One-Stop Post-PC service is available. The intent of One-Stop review is to close all outstanding conditions of approval and gain final document approval in an abbreviated time frame. Plans are reviewed on a first-come, first-serve basis in the One-Stop Center.

  - For eligible final plats, the applicant shall bring a mylar with all non-City Hall signatures provided. The applicant will also be required to establish required sureties prior to City Department signatures being applied. The sureties may be established after the one stop process.
  - In the case of site plans, the one stop process can only satisfy the City of Franklin review process. The review by State Authority and pre-construction meetings with staff in the field will still be required prior to the issue of stormwater and grading and/or utility construction permits.

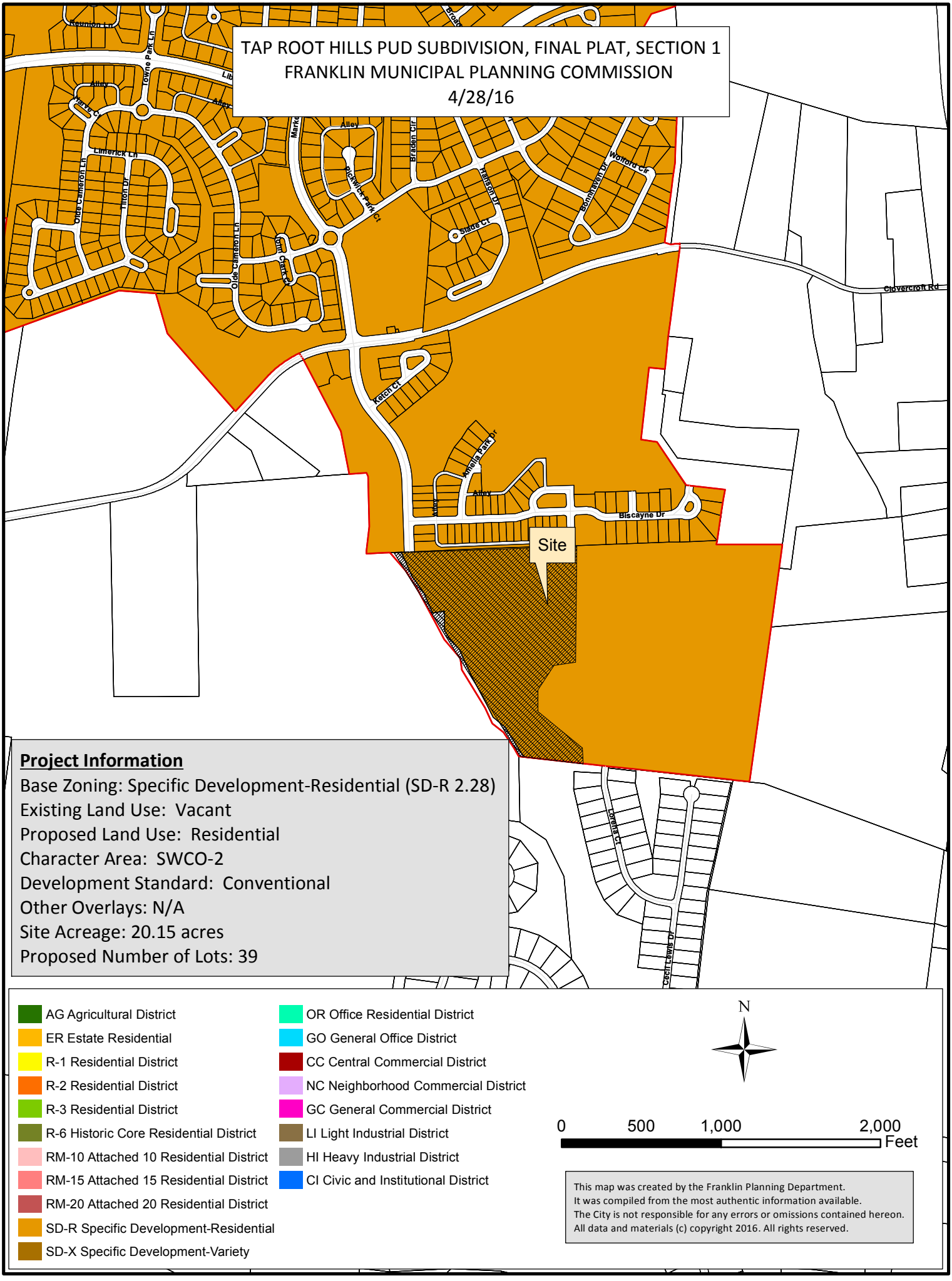
If all conditions of approval have not been met at the scheduled One-Stop review, the applicant will be required to submit the project for additional review at another scheduled One-Stop date. The next available One-Stop Post-PC date is **[DATE]** and the applicant must check in at the One Stop center **between the hours of 8:00 and 11:00 a.m.** in order for their plans to be reviewed that day. The applicant may contact the Department of Building and Neighborhood Services with any questions regarding the process and for any future One-Stop Post-PC dates.

Planning (Landscape)

General Comments

6. Critical Tree lts

- Lots, 10, 78, 83 and 84 shall be labeled and * as critical tree lots.


TAP ROOT HILLS PUD SUBDIVISION, FINAL PLAT, SECTION 1
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/16
Site
Biscayne Dr
Cloverclot Rd
Alley
Towne Park Ln
Limerick Ln
Olde Cameron Ln
Tiffon Dr
Tom Grant Cv
Stage Ct
Braden Cir
Harrison Dr
Bonnaraven Dr
Wofford Cir
Ketch Ct
Amelia Park Dr
Dorothy Ct
Cecil Lewis Dr
Project Information
Base Zoning: Specific Development-Residential (SD-R 2.28)
Existing Land Use: Vacant
Proposed Land Use: Residential
Character Area: SWCO-2
Development Standard: Conventional
Other Overlays: N/A
Site Acreage: 20.15 acres
Proposed Number of Lots: 39
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
500
1,000
2,000
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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Site Data

Project Name:	Tap Root Hills PUD Subdivison - Section One
COF Project #:	6081
Subdivision:	Tap Root Hills PUD Subdivison
Lot numbers:	Lots 1-11, 60-86, 104, 500-502 & 507 with Lots 500-502 & 507 being Open Spaces
Address:	Clovercroft Road
City:	Franklin
County:	Williamson
State:	Tennessee
Civil District:	14th
Existing zoning and charter area overlay:	SD-R (2.28) / SWC-02 (Seward Hall)
Applicable development standard:	Conventional
Acreage of site:	20.16 acres
Minimum required setback lines:	See Setback Detail this sheet
Owners representative:	Patterson Company, LLC
Address:	321 Billingsly Court, Suite 19 Franklin, TN 37067
Phone number:	615.472.1317
Email address:	WPatterson@buypatterson.com
Contact name:	Wes Patterson
Applicant:	Energy Land & Infrastructure
Address:	1420 Donelson Pike, Suite A12 Nashville, TN 37217
Phone number:	(615) 383-6300
Fax number:	(615) 383-6341
Email address:	michael.ray@eli-llc.com
Contact name:	Michael Ray
Engineer / Land Surveyor:	Energy Land & Infrastructure
Address:	1420 Donelson Pike, Suite A12 Nashville, TN 37217
Phone number:	(615 383-6300
Fax number:	(615) 383-6341
Contact names:	Mike Dial

Notes

1. The purpose of this plat is to create 39 single-family residential lots, and four open space lots.
2. This property is not located within a flood hazard area as per FEMA NFIP FIRM MAP NUMBER 47187C0220 F, MAP REVISED SEPTEMBER 29, 2006.
3. The lots shall be served by water from Milcrofton Utility District and sewer from the City of Franklin. Individual water and/or sanitary sewer service lines are required for each parcel.
4. Parcel ID's shown thus (000) pertain to property map 080.
5. All property corners not designated otherwise shall be marked with 1/2" iron rods x 18" long with plastic caps.
6. Bearings based on Tennessee Grid, NAD 83.
7. Within new development and for off-site lines constructed as a result of, or to provide service to, the new development, all utilities, such as cable television, electrical (excluding transformers), gas, sewer, telephone and water lines shall be placed underground.
8. All street light locations and quantities are approximate. Final positioning and quantity shall be at direction of MTEMC.
9. All open space area to be public utility and drainage easements (PUDEs).
10. The property owner(s) or Homeowner's association will maintain all open space, landscape and stormwater management feature areas, detention/retention areas, and all sidewalks and pathways located outside public rights-of-way. All roadways shall be public streets constructed to the City of Franklin specifications in public rights-of-way.
11. All Milcrofton Utility District (M.U.D.) easements shown are exclusive easements. No excavation, building, structure or obstruction of any kind shall be constructed or permitted within the easements except for the installation of pavement for private or public driveways which cross an easement. No trees or shrubbery will be planted within the utility and drainage easements.
12. Residential fire sprinklers systems shall be provided if 1,500 gpm / 20 psi is not available.
13. Sidewalks and trails outside of public right-of-way shall be public access easements and shall be maintained by the Homeowners Association.
14. Residential fire sprinklers (NFPA 13D) shall be provided in all new homes until the roadway connection to Watkins Creek Subdivision is complete and accessible for emergency vehicles.
15. No obstructions or encroachments which impede the flow of stormwater shall be permitted within Public Drainage Easements between lots. The City of Franklin is not responsible for repair or replacement of any encroachments that are damaged or removed in the course of maintenance activity within easements.
16. There shall be no mowing, clearing, grading, construction, storage, or disturbance of vegetation in riparian buffers except as permitted by the City Engineer, or his designee.
17. Any side elevation visible from a street shall have the same degree of architectural details as the front facade.

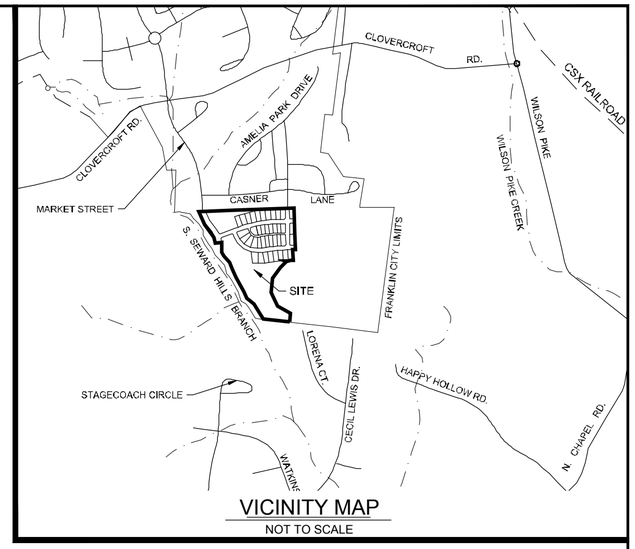
Total area: 878,090 S.F. or 20.158 Acres

Road Data:

Acreage in new roads including alley right-of-ways	3.32 Acres
Linear footage of new roads	1,730 Feet
Linear footage of new alleys	519 Feet

Deed Reference

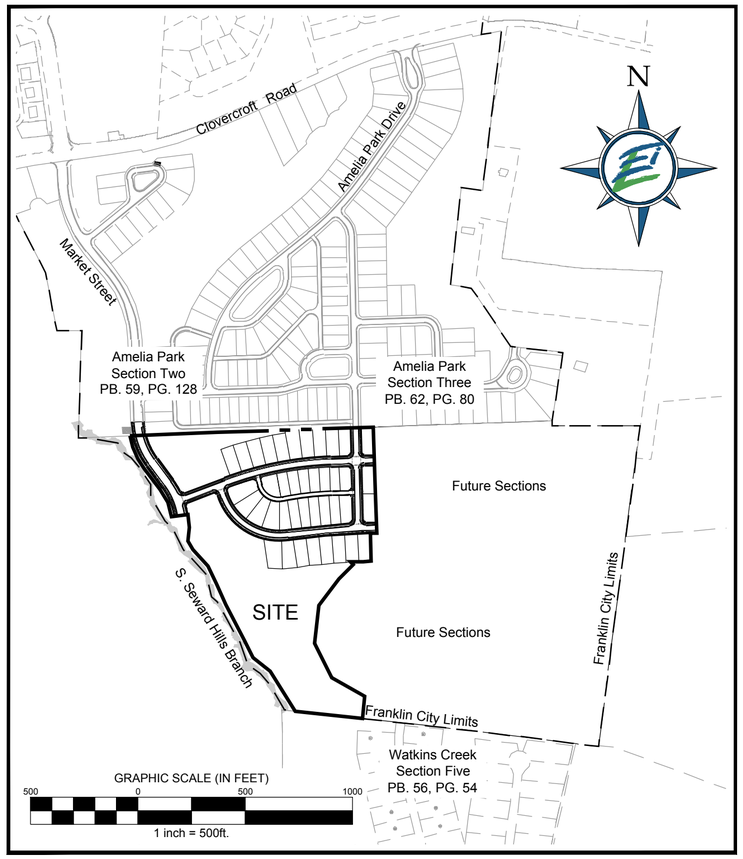
TAX MAP 080, PART OF PARCEL 44.03
Owner: Patterson Company, LLC
P/O Deed Book 6336, Page 102
Register's Office for Williamson County, TN

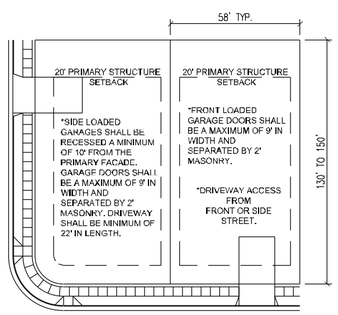


VICINITY MAP
NOT TO SCALE

Lot Table/Tree Requirement Chart					
Lot #	Square Feet	Acres	ACI	Cal. Inches per Tree	# of Trees
1	7,794	0.18	6	2	3
2	7,794	0.18	6	2	3
3	7,794	0.18	6	2	3
4	7,794	0.18	6	2	3
5	7,794	0.18	6	2	3
6	8,397	0.19	6	2	3
7	8,055	0.18	6	2	3
8	7,862	0.18	6	2	3
9	7,628	0.18	6	2	3
10	7,161	0.16	6	2	3
11	7,470	0.17	6	2	3
45	7,609	0.17	6	2	3
46	7,610	0.17	6	2	3
60	7,566	0.17	6	2	3
63	7,610	0.17	6	2	3
64	7,611	0.17	6	2	3
65	7,607	0.17	6	2	3
66	8,240	0.19	6	2	3
67	9,577	0.22	12	2	6
68	7,572	0.17	6	2	3

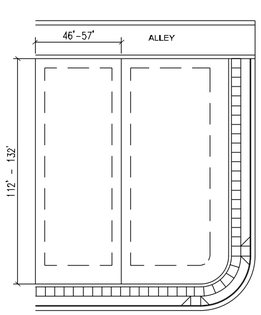
Lot Table/Tree Requirement Chart					
Lot #	Square Feet	Acres	ACI	Cal. Inches per Tree	# of Trees
69	6,330	0.15	6	2	3
70	6,408	0.15	6	2	3
71	6,444	0.15	6	2	3
72	6,433	0.15	6	2	3
73	6,377	0.15	6	2	3
74	6,363	0.15	6	2	3
75	8,169	0.19	6	2	3
76	8,280	0.19	6	2	3
77	8,590	0.20	6	2	3
78	9,783	0.22	12	2	6
79	5,359	0.12	6	2	3
80	5,360	0.12	6	2	3
81	5,358	0.12	6	2	3
82	5,358	0.12	6	2	3
83	5,360	0.12	6	2	3
84	5,113	0.12	6	2	3
85	6,139	0.14	6	2	3
86	7,767	0.18	6	2	3
104	8,001	0.18	6	2	3





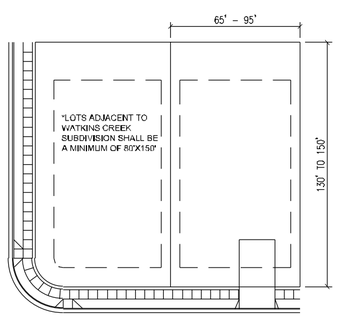
SINGLE FAMILY DETACHED A (LABELED AS TYPE A)

10' FRONT YARD
10' CORNER YARD
5' SIDE YARD
20' REAR YARD FOR PRIMARY STRUCTURE



ALLEY LOADED SINGLE FAMILY DETACHED (LABELED AS ALLEY)

10' FRONT YARD
10' CORNER YARD
5' SIDE YARD
5' REAR YARD



SINGLE FAMILY DETACHED B (LABELED AS TYPE B)

15' FRONT YARD
15' CORNER YARD
5' SIDE YARD
20' REAR YARD

Certificate Of Ownership

I (we) hereby certify that I am (we are) the owner(s) of the property shown hereon as of record in Book 6336, Page 102, R.O.W.C., Tennessee and that I (we) hereby adopt this plan of subdivision of the property as shown hereon and dedicate all public ways and easements as noted. No lot or lots as shown hereon shall again be subdivided, re-subdivided, altered or changed so as to produce less area than is hereby established until otherwise approved by the Franklin Municipal Planning Commission and under no condition shall such lot or lots be made to produce less area than is prescribed by the restrictive covenants as of record in Book _____ , Page _____ , R.O.W.C., Tennessee, running with the title to the property. I (we) further certify that there are no liens on this property, except as follows: Deed of Trust Book 6336, Page 105, R.O.W.C., Tennessee.

Owner _____ Date _____

Certificate Of Approval of Subdivision Name, Street Names, and Addressing

Subdivision name and street names approved by the Williamson County Emergency Management Agency.

Williamson County Emergency Management Agency _____ Date _____

City of Franklin _____ Date _____

Certificate Of Approval of Sewer Systems

I hereby certify that:
(1) The sewer system designated in Tap Root Hills - Section One has been installed in accordance with City specifications, or
(2) A performance agreement and surety in the amount of $ _____ for the sewer system has been posted with the City of Franklin, Tennessee, to assure completion of such systems.

Director, Water Management Department
City of Franklin, Tennessee _____ Date _____

Certificate Of Approval of Water

I hereby certify that:
(1) The water system designated in Tap Root Hills - Section One has been installed in accordance with City specifications, or
(2) A performance agreement and surety in the amount of $ _____ for the water system has been posted with the Milcrofton Utility District to assure completion of such improvements.

General Manager, Milcrofton Utility District _____ Date _____

Certificate Of Approval of Streets, Drainage, and Sidewalks

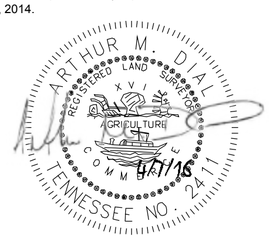
I hereby certify that:
(1) the streets, drainage, and sidewalks designated in Tap Root Hills - Section One has been installed in accordance with City specifications, or
(2) a performance agreement and surety in the amount of $ _____ for streets, $ _____ for access, $ _____ for drainage,
and $ _____for sidewalks has been posted with the City of Franklin, Tennessee, to assure completion of such improvements.

Director, Streets Department
City of Franklin, Tennessee _____ Date _____

Certificate Of Survey

I (we) hereby certify that the subdivision plat as shown hereon is correct and that all of the monuments shown hereon will be placed as indicated upon completion of construction. This subdivision plat correctly represents a survey prepared by Energy Land & Infrastructure, LLC dated November 25, 2014.

Surveyor Information
Mike Dial
ELI, LLC
1420 Donelson Pike, Suite A12
Nashville, Tn 37217
Phone: 615-383-6300
Email: mike.dial@eli-llc.com



Certificate Of Approval for Recording

Approved by the Franklin Municipal Planning Commission, Franklin, Williamson County, Tennessee, with the exception of such conditions, if any, as are noted in the Planning Commission minutes for the _____ day of _____, 2016, and this plat has been approved for recording in the Register's Office of Williamson County.

Secretary, Franklin Municipal Planning Commission _____ Date _____

TAP ROOT HILLS PUD SUBDIVISION - SECTION ONE

SHEET 1 OF 3

14th CIVIL DISTRICT

FRANKLIN, WILLIAMSON COUNTY, TENNESSEE
CITY OF FRANKLIN PROJECT #6081
DATE: 03-14-2016
REVISED: 04-07-2016

ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A12 · NASHVILLE, TN 37217
OFFICE 615-383-6300 · WWW.ELI-LLC.COM
ENGINEERS·SURVEYORS·INFRASTRUCTURE·ENVIRONMENTAL

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Amelia Park
Section Two
PB. 59, PG. 128

Amelia Park
Section Three
PB. 62, PG. 80

ALLEY 3 (20' ROW)

FAIRBANKS STREET

15' MUD Waterline Easement (see note 11)

N87°37'38"E 408.35'

N88°02'09"E 725.69'

N01°14'27"W 116.85'

S01°14'27"E 117.17'

S88°02'09"W 45.40'

Proposed Fire Hydrant (Typical)

S01°57'51"E 310.00'

N88°02'09"E 46.36'

N01°14'27"W 238.02'

S88°02'09"W 1.70'

10' Drainage Easement

S01°57'51"E 184.00'

S88°02'09"W 47.67'

S88°02'09"W 35.05'

S88°02'09"W 30.85'

S01°57'51"E 130.00'

C1T

65' R.O.W.

MARKET STREET
65' PUBLIC ROW (LOCAL)

N36°42'33"W 124.81'

N36°42'33"W 123.52'

Retaining Wall

C3

C5

Preserved Wetlands

N36°42'33"W 124.81'

30' Sewer Easment

60' (Average) Zone 2 Buffer

30' Zone 1 Buffer

500
Open
Space
84,943 sq. ft or
1.95 acres

NOLENCREST DRIVE
50' PUBLIC ROW (LOCAL)

S69°13'26"W 197.78'

502
Open Space
7,074 sq. ft.
or 0.16 acres

20' PUBLIC ROW (ALLEY)

FAIRBANKS STREET
50' PUBLIC ROW (LOCAL)

507
Open
Space
5,534 sq. ft or
0.13 acres

South Seward Hills Branch

C2

C4

N69°13'26"E 125.91'

S81°00'14"W 78.00'

C1

N30°51'44"W 48.17'

N41°46'47"W 103.13'

Bioretention / Detention Area

15' MUD Waterline Easement (see note 11)

Underground Storm

Edge of Detention Pond

Edge of Detention Pond

30' Sewer Easment

60' (Average) Zone 2 Buffer

30' Zone 1 Buffer

501
Open
Space
352,574 sq. ft. or
8.094 acres

S88°12'24"E 66.69'

Bioretention Area

10' Drainage Easement

20' Sewer Easement

FARMHOUSE DRIVE
50' PUBLIC ROW (LOCAL)

L1 L2 L3 L4

SHEET 2
SHEET 3

SHEET 2
SHEET 3

N
TN STATE PLANE
NAD 83

GRAPHIC SCALE (IN FEET)
60 0 60 120
1 inch = 60 ft.

Legend

- Fire Hydrant
- W — Water Line
- S — Sewer Line
- (S) Sewer Manhole
- Iron Rod (New)
- Monument (New)
- Proposed Stormwater Inlet
- Concrete Sidewalk
- (1) Lot Number

Utility Note

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ARTHUR M. DIAL
REGISTERED LAND SURVEYOR
TENNESSEE NO. 2411
4/7/16

Tennessee 811
Know what's below.
Call before you dig.

TAP ROOT HILLS PUD
SUBDIVISION - SECTION ONE

SHEET 2 OF 3

14th CIVIL DISTRICT

FRANKLIN, WILLIAMSON COUNTY, TENNESSEE
CITY OF FRANKLIN PROJECT #6081
DATE: 03-14-2016
REVISED: 04-07-2016

ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A12 · NASHVILLE, TN 37217
OFFICE 615-383-6300 · WWW.ELI-LLC.COM
ENGINEERS·SURVEYORS·INFRASTRUCTURE·ENVIRONMENTAL

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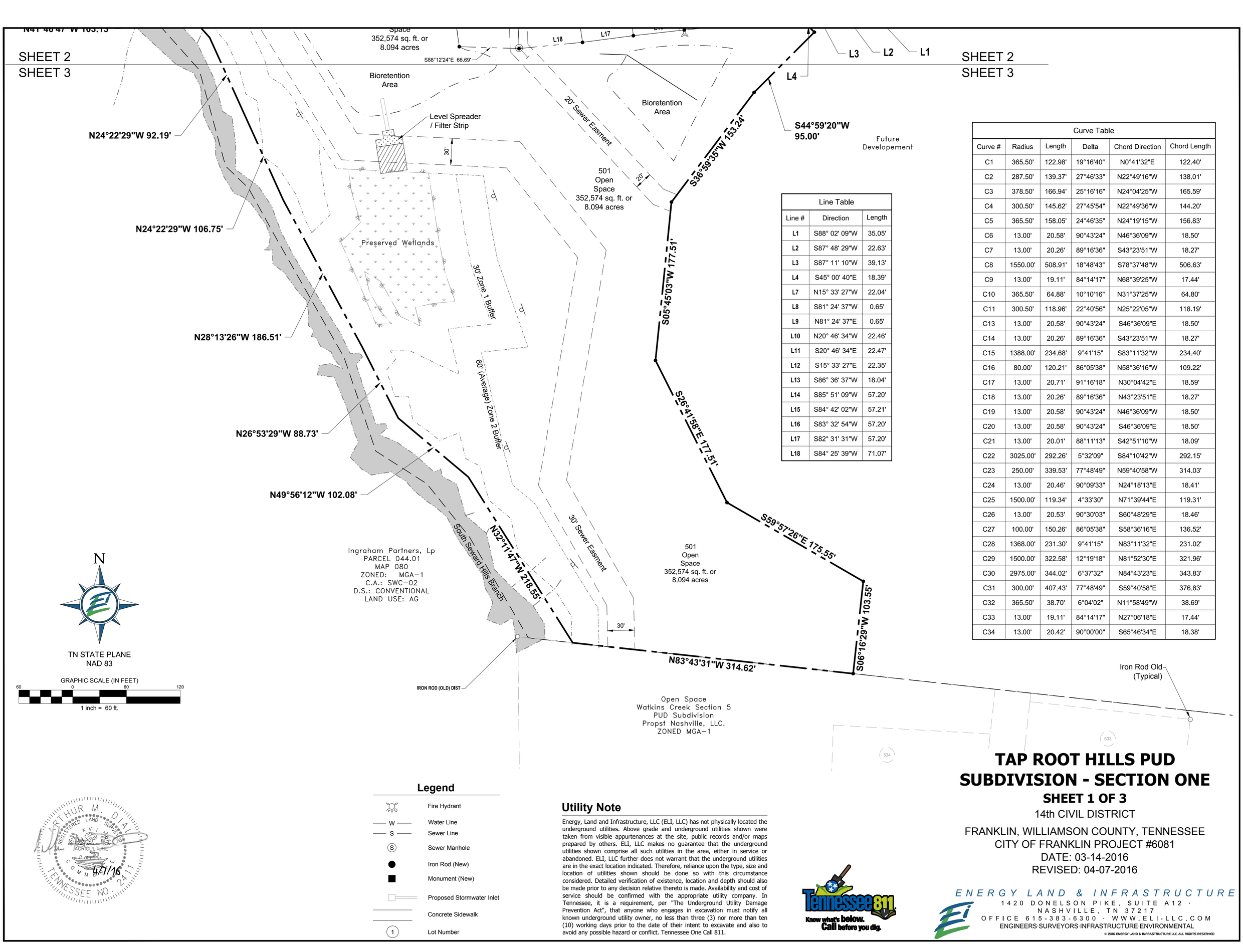

Line Table		
Line #	Direction	Length
L1	S88° 02' 09"W	35.05'
L2	S87° 48' 29"W	22.63'
L3	S87° 11' 10"W	39.13'
L4	S45° 00' 40"E	18.39'
L7	N15° 33' 27"W	22.04'
L8	S81° 24' 37"W	0.65'
L9	N81° 24' 37"E	0.65'
L10	N20° 46' 34"W	22.46'
L11	S20° 46' 34"E	22.47'
L12	S15° 33' 27"E	22.35'
L13	S86° 36' 37"W	18.04'
L14	S85° 51' 09"W	57.20'
L15	S84° 42' 02"W	57.21'
L16	S83° 32' 54"W	57.20'
L17	S82° 31' 31"W	57.20'
L18	S84° 25' 39"W	71.07'

Curve Table					
Curve #	Radius	Length	Delta	Chord Direction	Chord Length
C1	365.50'	122.98'	19°16'40"	N0°41'32"E	122.40'
C2	287.50'	139.37'	27°46'33"	N22°49'16"W	138.01'
C3	378.50'	166.94'	25°16'16"	N24°04'25"W	165.59'
C4	300.50'	145.62'	27°45'54"	N22°49'36"W	144.20'
C5	365.50'	158.05'	24°46'35"	N24°19'15"W	156.83'
C6	13.00'	20.58'	90°43'24"	N46°36'09"W	18.50'
C7	13.00'	20.26'	89°16'36"	S43°23'51"W	18.27'
C8	1550.00'	508.91'	18°48'43"	S78°37'48"W	506.63'
C9	13.00'	19.11'	84°14'17"	N68°39'25"W	17.44'
C10	365.50'	64.88'	10°10'16"	N31°37'25"W	64.80'
C11	300.50'	118.96'	22°40'56"	N25°22'05"W	118.19'
C13	13.00'	20.58'	90°43'24"	S46°36'09"E	18.50'
C14	13.00'	20.26'	89°16'36"	S43°23'51"W	18.27'
C15	1388.00'	234.68'	9°41'15"	S83°11'32"W	234.40'
C16	80.00'	120.21'	86°05'38"	N58°36'16"W	109.22'
C17	13.00'	20.71'	91°16'18"	N30°04'42"E	18.59'
C18	13.00'	20.26'	89°16'36"	N43°23'51"E	18.27'
C19	13.00'	20.58'	90°43'24"	N46°36'09"W	18.50'
C20	13.00'	20.58'	90°43'24"	S46°36'09"E	18.50'
C21	13.00'	20.01'	88°11'13"	S42°51'10"W	18.09'
C22	3025.00'	292.26'	5°32'09"	S84°10'42"W	292.15'
C23	250.00'	339.53'	77°48'49"	N59°40'58"W	314.03'
C24	13.00'	20.46'	90°09'33"	N24°18'13"E	18.41'
C25	1500.00'	119.34'	4°33'30"	N71°39'44"E	119.31'
C26	13.00'	20.53'	90°30'03"	S60°48'29"E	18.46'
C27	100.00'	150.26'	86°05'38"	S58°36'16"E	136.52'
C28	1368.00'	231.30'	9°41'15"	N83°11'32"E	231.02'
C29	1500.00'	322.58'	12°19'18"	N81°52'30"E	321.96'
C30	2975.00'	344.02'	6°37'32"	N84°43'23"E	343.83'
C31	300.00'	407.43'	77°48'49"	S59°40'58"E	376.83'
C32	365.50'	38.70'	6°04'02"	N11°58'49"W	38.69'
C33	13.00'	19.11'	84°14'17"	N27°06'18"E	17.44'
C34	13.00'	20.42'	90°00'00"	S65°46'34"E	18.38'

N

TN STATE PLANE
NAD 83

GRAPHIC SCALE (IN FEET)
60 0 60 120
1 inch = 60 ft.

ARTHUR M. DIAL
REGISTERED LAND SURVEYOR
AGRICULTURE
4/7/16
TENNESSEE NO. 2411

Legend

- Fire Hydrant
- W — Water Line
- S — Sewer Line
- (S) Sewer Manhole
- ● Iron Rod (New)
- ■ Monument (New)
- Proposed Stormwater Inlet
- Concrete Sidewalk
- (1) Lot Number

Utility Note

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Tennessee 811
Know what's below.
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TAP ROOT HILLS PUD
SUBDIVISION - SECTION ONE

SHEET 1 OF 3

14th CIVIL DISTRICT

FRANKLIN, WILLIAMSON COUNTY, TENNESSEE
CITY OF FRANKLIN PROJECT #6081
DATE: 03-14-2016
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COF no: 6088

CONDITIONS OF APPROVAL:

Performance Agreement and Surety

General Comments

1. Engineering Sureties

-

Any unposted sureties associated with this development from site plan(s) 5850 shall be transferred to this final plat as a condition of approval. No action is necessary from applicant.

(Previous comment restated for informational purposes only, no response necessary.)

Planning

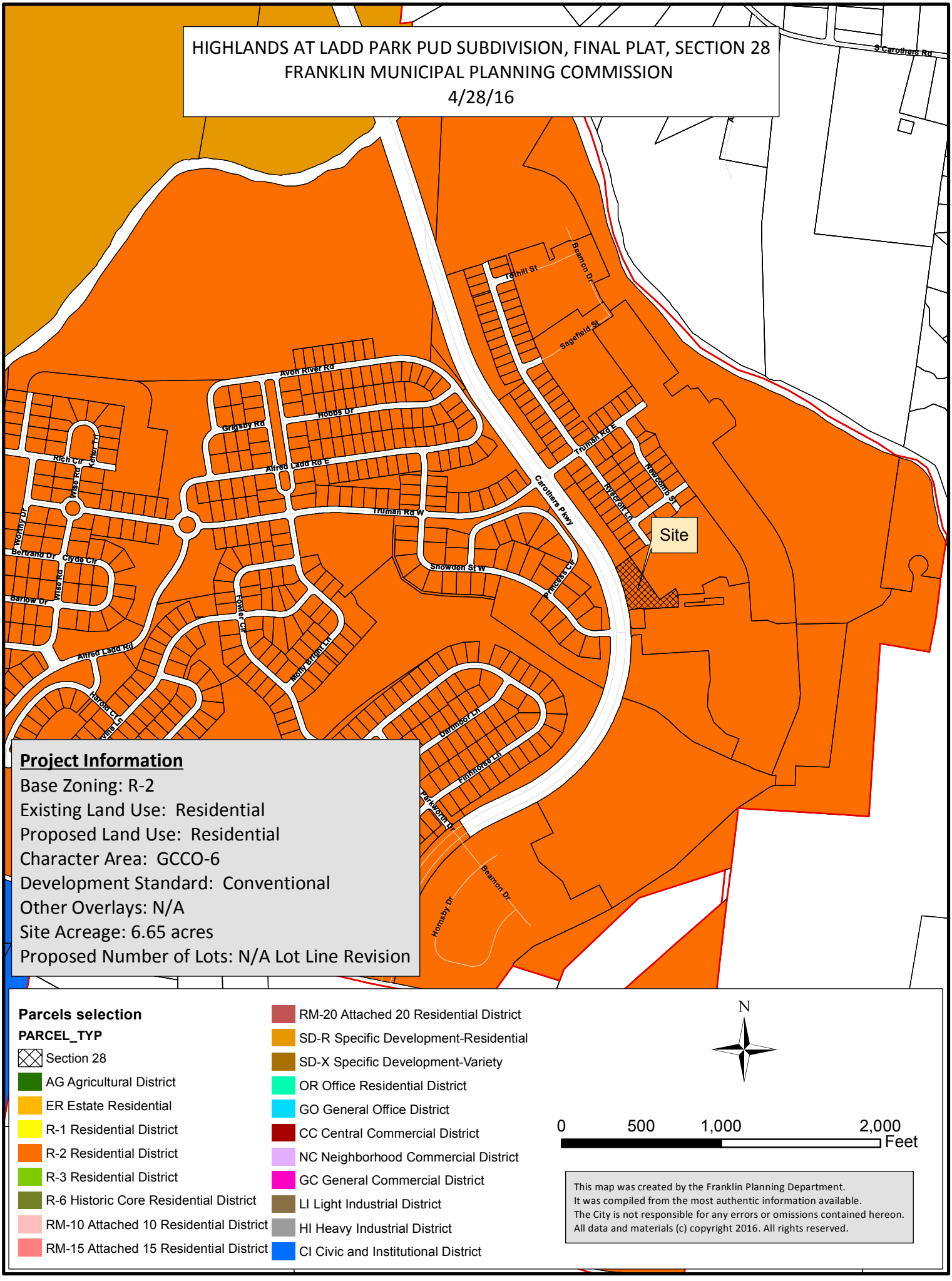
General Comments

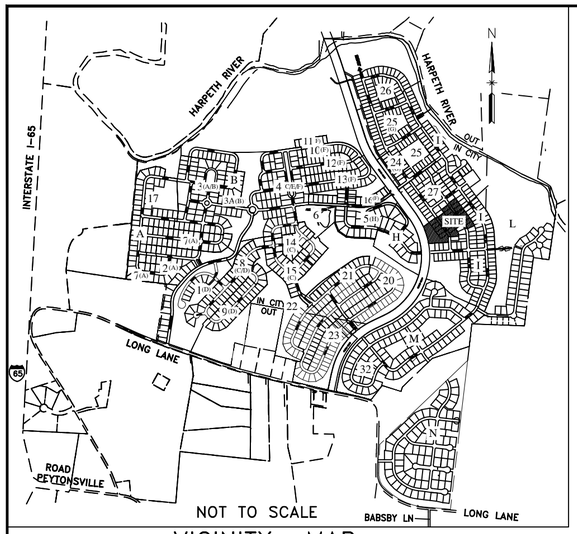
2. One-Stop Procedure

- Due to the applicant's diligence in addressing staff comments and resolving most issues prior to resubmittal, this project is eligible for the One-Stop Post-PC review process. To participate in the One-Stop Post-PC process, the applicant must submit complete and corrected plans electronically through the IDT online review system by the scheduled One-Stop review date and be present at the One-Stop Center on the scheduled date and time that the One-Stop Post-PC service is available. The intent of One-Stop review is to close all outstanding conditions of approval and gain final document approval in an abbreviated time frame. Plans are reviewed on a first-come, first-serve basis in the One-Stop Center.

- For eligible final plats, the applicant shall bring a mylar with all non-City Hall signatures provided. The applicant will also be required to establish required sureties prior to City Department signatures being applied. The sureties may be established after the one stop process.
- In the case of site plans, the one stop process can only satisfy the City of Franklin review process. The review by State Authority and pre-construction meetings with staff in the field will still be required prior to the issue of stormwater and grading and/or utility construction permits.

If all conditions of approval have not been met at the scheduled One-Stop review, the applicant will be required to submit the project for additional review at another scheduled One-Stop date. The next available One-Stop Post-PC date is **[DATE]** and the applicant must check in at the One Stop center **between the hours of 8:00 and 11:00 a.m.** in order for their plans to be reviewed that day. The applicant may contact the Department of Building and Neighborhood Services with any questions regarding the process and for any future One-Stop Post-PC dates.


HIGHLANDS AT LADD PARK PUD SUBDIVISION, FINAL PLAT, SECTION 28
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/16
Site
Project Information
Base Zoning: R-2
Existing Land Use: Residential
Proposed Land Use: Residential
Character Area: GCCO-6
Development Standard: Conventional
Other Overlays: N/A
Site Acreage: 6.65 acres
Proposed Number of Lots: N/A Lot Line Revision
Parcels selection
PARCEL_TYP
Section 28
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0 500 1,000 2,000
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
All data and materials (c) copyright 2016. All rights reserved.



NOT TO SCALE

VICINITY MAP

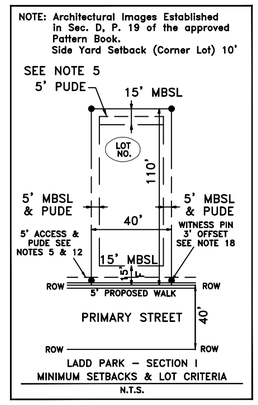
LOT AREA TABLE			REQUIRED # OF 3" CALIPER TREES PER LOT
LOT NO.	SQ. FT.	ACRES	3" TREES
693	7,560.00	0.174	2
694	7,560.00	0.174	2
695	7,560.00	0.174	2
696	7,560.00	0.174	2
697	7,560.00	0.174	2
699	11,422.90	0.262	3
700	7,562.79	0.174	2
701	7,560.00	0.174	2
702	7,560.00	0.174	2
703	7,560.00	0.174	2
704	7,560.00	0.174	2
708	7,560.00	0.174	2
709	7,560.00	0.174	2
710	7,560.00	0.174	2

LOT AREA TABLE			REQUIRED # OF 3" CALIPER TREES PER LOT
LOT NO.	SQ. FT.	ACRES	3" TREES
711	7,560.00	0.174	2
712	7,560.00	0.174	2
713	7,560.00	0.174	2
714	8,113.56	0.186	2
756	8,535.48	0.196	2
757	7,725.44	0.177	2
758	7,560.00	0.174	2
759	7,560.00	0.174	2
760	7,560.00	0.174	2
761	7,560.00	0.174	2
762	7,560.00	0.174	2
763	7,560.00	0.174	2
TOTAL LOTS	194,006.60	4.454	
O.S. 2033	61,952.56	1.422	
ROW	14,647.65	0.336	
ROW	19,103.26	0.439	
TOTAL ROW	33,750.91	0.775	
TOTAL	289,710.07	6.651	

LEGEND

- FIRE HYDRANT PROPOSED ····· FH
- LIGHT POLE PROPOSED ····· ☐
- EXISTING POWER POLE ····· —
- CURB INLET PROPOSED ····· ■
- IRON PIN FOUND ····· ● (F)
- 5/8" IRON PIN SET THIS PLAT ···· ●
- UTILITY STUB OUT ····· ST
- STREET ADDRESS ····· 714
- SEWER MANHOLE PROPOSED ····· ○
- PROPERTY/R.O.W. LINE ····
- PUBLIC UTILITY & DRAINAGE EASEMENT ····· PUDE
- PROPOSED 8" WATER LINE ···· 8 W
- PROPOSED 8" SEWER LINE ···· S 8
- PROPOSED CURB LINES ····
- SANITARY SEWER EASEMENT ···· 20' SSE
- MIILCROFTON EASEMENT SEE NOTE 17 ····· MUDEE
- ACCESS & PUBLIC UTILITY & DRAINAGE EASEMENT ····· 5' AE & PUDE
- HOME OWNERS ASSOCIATION EASEMENT ····· HOA ESMT
- MIDDLE TENNESSEE ELECTRIC MEMBERSHIP CORPORATION EASEMENT SEE NOTE 16 ····· 15' MTE

TYPICAL LOT DETAIL
N.T.S.



GRAPHIC SCALE

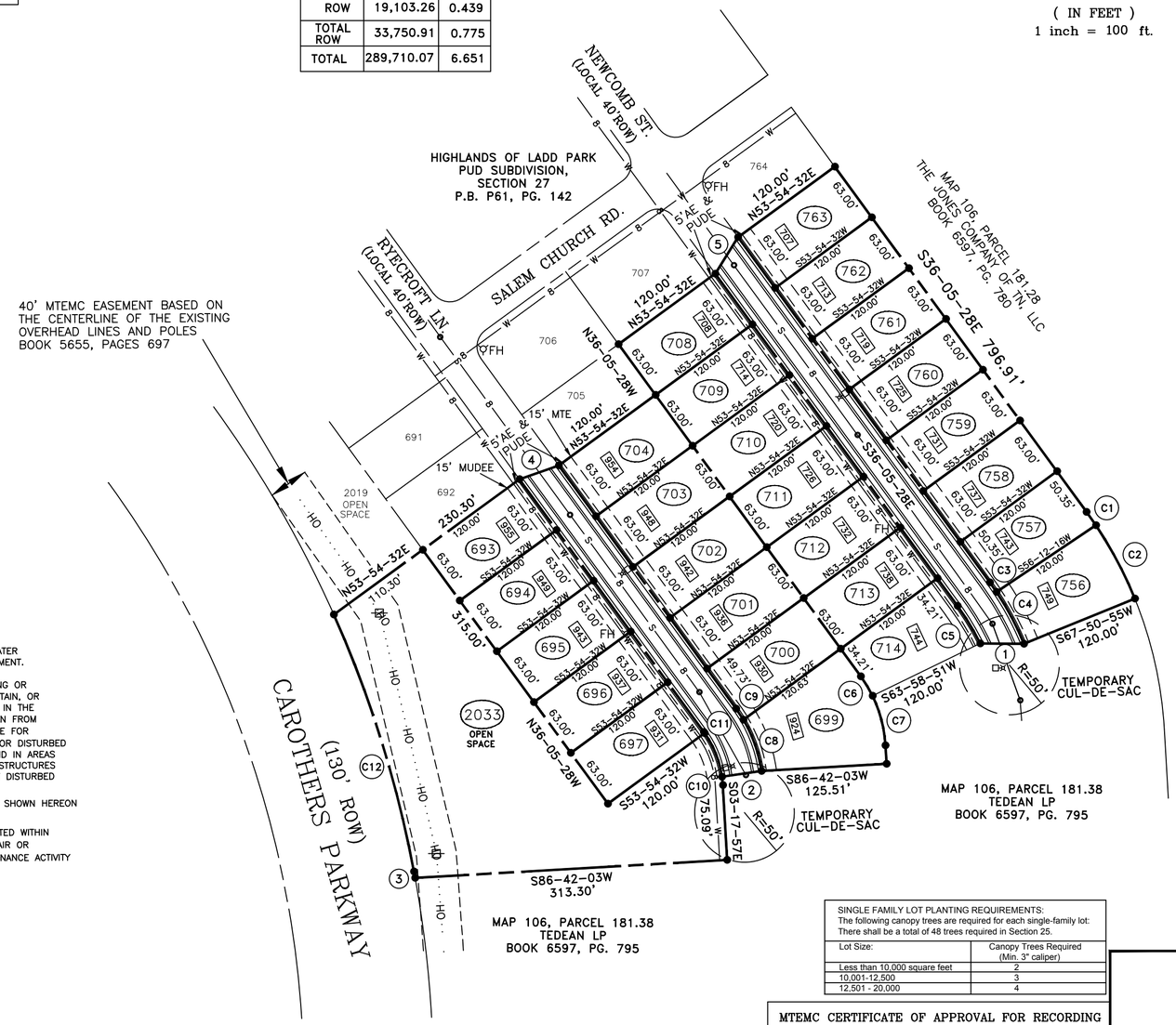
100 0 50 100 200

(IN FEET)
1 inch = 100 ft.

ADSZONE 5301, FIPSZONE 4100
S.P.C.S. NAD 83

NOTES:

1) THE PURPOSE OF THIS PLAT IS TO CREATE 26 RESIDENTIAL LOTS 1 OPEN SPACE LOT AND DEDICATE ROW FOR SECTION 28 HIGHLANDS AT LADD PARK PUD SUBDIVISION.
2) ALL DISTANCES WERE MEASURED WITH E.D.M. EQUIPMENT AND HAVE BEEN ADJUSTED FOR TEMPERATURE.
3) UTILITIES HAVE BEEN PLOTTED FROM SURFACE FEATURES FOUND AT THE TIME OF SURVEY AND AVAILABLE MAPS AND RECORDS. THERE MAY BE OTHER UTILITIES, THE EXISTENCE OF WHICH ARE NOT KNOWN TO THE UNDERSIGNED. SIZE AND LOCATION OF ALL UNDERGROUND UTILITIES MUST BE VERIFIED BY THE APPROPRIATE UTILITY COMPANY PRIOR TO ANY CONSTRUCTION.
4) BY SCALING, GRAPHIC INTERPOLATION AND PLOTTING THE SUBJECT PROPERTY IS LOCATED IN ZONE "X" "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN" AS SHOWN ON F.E.M.A. "FLOOD RATE INSURANCE MAP", MAP NO. 47187C0360F DATED: 9-29-06.
5) 5' DRAINAGE AND UTILITY EASEMENT ALONG ALL EXTERIOR BOUNDARY LINES AND ALONG ROAD RIGHT-OF-WAYS, AND 5' ALONG EACH SIDE OF INTERIOR LOT LINES. SEE TYPICAL LOT DETAIL.
6) 5/8" IRON RODS WITH CAPS (●) SET AT ALL CORNERS UNLESS OTHERWISE SHOWN.
7) WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES (INCLUDING CABLE TELEVISION, ELECTRICAL, NATURAL GAS SEWER, TELEPHONE AND WATER LINES) SHALL BE PLACED UNDERGROUND.
8) DEED REFERENCE FOR THE PROPERTY SURVEYED IS AS FOLLOWS: PARCEL 181.33 THE JONES COMPANY OF TENNESSEE, LLC IN BOOK 6297, PG. 12.
9) STREET LIGHTS LOCATIONS AND QUANTITIES ARE APPROXIMATE. FINAL POSITIONING AND QUANTITY SHALL BE AT DIRECTION OF MTEMC.
10) THIS PROPERTY IS ALL OF WILLIAMSON COUNTY TAX MAP 106, PARCEL 181.33.
11) THIS PROPERTY IS ZONED R2 AND GCCO-6/CONVENTIONAL; MINIMUM DEPTH=100', WIDTH AT SETBACK=63', SEE TYPICAL LOT DETAIL FOR SPECIFIC SETBACK INFORMATION.
12) THE 5' ACCESS EASEMENTS (AE) AS SHOWN HEREON SHALL CONTAIN CONCRETE SIDEWALK AND BE MAINTAINED BY THE HOA. SEE TYPICAL LOT DETAIL.
13) ALL OPEN SPACE IS PUBLIC UTILITY AND DRAINAGE EASEMENT (PUDE) AND SHALL BE MAINTAINED BY THE HOA. ALL DRAINAGE EASEMENTS SHALL BE MAINTAINED BY THE HOA. MAINTENANCE OF ALL STORMWATER MANAGEMENT FEATURES SHALL BE THE RESPONSIBLIITY OF THE PROPERTY OWNER(S) OR THE HOA.
14) THERE IS A 3' MINIMUM GARAGE SETBACK FOR ALL STREET LOADED GARAGES MEASURED FROM THE FRONT FACADE OF THE HOUSE.
15) CURRENT OWNER HAS NO KNOWLEDGE OF ANY ENTITY HAVING MINERAL RIGHTS TO THE SUBJECT PROPERTY.
16) THERE SHALL BE A 15' MIDDLE TENNEESEE ELECTRIC MEMBERSHIP CORPORATION EASEMENT ALONG ALL RIGHT-OF-WAYS CREATED HEREON, ACCEPT WHERE THERE IS A PROPOSED MILCROFTON UTILITY DISTRICT WATERLINE (SEE NOTE 17).
17) MILCROFTON UTILITY DISTRICT (MILCROFTON) HAS UNRESTRICTED ACCESS TO ITS WATER LINES AND WATER SYSTEM IMPROVEMENTS LOCATED WITHIN ITS EXCLUSIVE WATER LINE EASEMENTS WITHIN THE DEVELOPMENT. IN THE EVENT LANDSCAPING, FENCING OR OTHER STRUCRURES ARE INSTALLED OR PLACED WITHIN A MILCROFTON EASEMENT, MILCROFTON SHALL HAVE THE RIGHT TO REMOVE SUCH LANDSCAPING, FENCING OR OTHER STRUCTURE WITHIN THE EASEMENT AS MAY BE NECESSARY FOR MILCROFTON TO REPAIR, MAINTAIN, OR REPLACE ITS LINES, VALVES, APPLIANCES, FITTINGS OR OTHER WATER FACILITIES WHICH ARE NOW OR IN THE FUTURE WHICH MAY BE LOCATED WITHIN THE EASEMENT WITHOUT OBTAINING ANY FURTHER PERMISSION FROM DECLARANT OR SUBSEQUENT PROPERTY OWNERS. DECLARANT OR ASSOCIATION SHALL BE RESPONSIBLE FOR REPAIRING AND/OR REPLACING ANY SUCH LANDSCAPING, FENCING OR OTHER STRUCTURES REMOVED OR DISTURBED BY MILCROFTON AT THE DECLARANT'S OR ASSOCIATION'S EXPENSE IN COMMON OPEN SPACE LOTS AND IN AREAS OWNED BY THE DECLARANT OR ASSOCIATION. INDIVIDUAL HOMEOWNERS SHALL BE RESPONSIBLE FOR STRUCTURES REMOVED OR DISTURBED BY MILCROFTON AT THE HOMEOWNERS EXPENSE ON THE HOMEOWNER'S LOT DISTURBED BY MILCROFTON AT THE HOMEOWNERS EXPENSE ON THE HOMEOWNER'S LOT.
18) ALL CORNERS FALLING ALONG RIGHT OF WAY THAT FALL WITHIN THE PROPOSED CONCRETE WALKS AS SHOWN HEREON WILL BE SET 3' OFFSET FROM THE PROPERTY LINE BEHIND THE WALK AS A WITNESS PIN.
19) NO OBSTRUCTIONS OR ENCROACHMENTS WHICH IMPEDE THE FLOW OF STORMWATER SHALL BE PERMITTED WITHIN PUBLIC DRAINAGE EASEMENTS BETWEEN LOTS. THE CITY OD FRANKLIN IS NOT RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ANY ENCROACHMENTS THAT ARE DAMAGED OR REMOVED IN THE COURSE OF MAINTENANCE ACTIVITY WITHIN EASEMENTS.



CERTIFICATE OF APPROVAL OF SUBDIVISION NAME, STREET NAMES AND ADDRESSING

Subdivision name and street names approved by the Williamson County Emergency Management Agency.

Williamson County Emergency Management Agency — Date

City of Franklin, Tennessee — Date

CERTIFICATE OF OWNERSHIP

I (We) hereby certify that I am (we are) the owner(s) of the property shown hereon (SEE NOTE 8) and adopt the plan of subdivision of the property shown hereon and dedicate all public ways and easements as noted. No lot(s) as shown hereon shall again be subdivided, resubdivided, altered, or changed so as to produce less area than is hereby established until otherwise approved by the Franklin Municipal Planning Commission, and under no condition shall such lot(s) be made to produce less area than is perscribed by the restrictive covenants as of record in Book_____, Page_____, R.O.W.C., Tennessee, running with the title to the property I (We) further certify that there are no leins on this property, except as follows:

Book_____, Page_____, R.O.W.C., Tennessee.

By: _____ Date: _____

DAVID E. PITTA, DIRECTOR OF LAND ACQUISITION AND DEVELOPMENT
THE JONES COMPANY OF TENNESSEE, LLC

CERTIFICATE OF APPROVAL OF WATER AND SEWER SYSTEMS

I hereby certify that:
(1) the sewer systems designated in HIGHLANDS AT LADD PARK PUD SUBDIVISION, SECTION 28, Subdivision have been installed in accordance with City specifications, or
(2) a performance agreement and surety in the amount of $_____ for the sewer system has been posted with the City of Franklin, Tennessee, to assure completion of such systems.

Director Sewer Management Department City of Franklin, TN — Date

(3) a performance bond in the amount of $_____ for the on site water system and/or $_____ for off-site water system has been posted with the Milcrofton Utility District to assure completion of such systems.

General Manger Milcrofton Utility District — Date

CERTIFICATE OF APPROVAL OF STREETS, DRAINAGE AND SIDEWALKS

I hereby certify that:
(1) the streets, drainage and sidewalks designated in THE HIGHLANDS AT LADD PARK PUD SUBDIVISION, SECTION 28, have been installed in accordance with City specifications, or

amount of $_____ for streets, $_____ for drainage and $_____ for sidewalks has been posted with the City of Franklin, Tennessee to assure completion of such improvements.

Director Streets Department City of Franklin, Tennessee — Date

CERTIFICATE OF APPROVAL FOR RECORDING

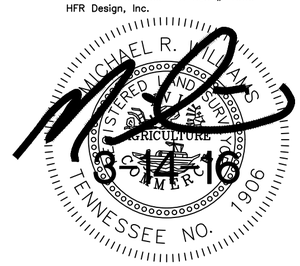
Approved by the Franklin Municipal Planning Commission, Franklin, Williamson County, Tennessee, with the exception of such conditions, if any, as are noted in the Planning Commission minutes for the _____ day of _____, 20____, and this plat has been approved for recording in the Register's Office of Williamson County.

Secretary: Franklin Municipal Planning Commission — Date

CERTIFICATE OF SURVEY

I (We) hereby certify that the subdivision plat as shown hereon is correct and that all of the monuments shown hereon have been placed as indicated. This subdivision plat correctly represents a survey made under my supervision on the _____ day of _____, 20____

Michael R. Williams TN RLS # 1906
HFR Design, Inc.



SINGLE FAMILY LOT PLANTING REQUIREMENTS: The following canopy trees are required for each single-family lot: There shall be a total of 48 trees required in Section 25.	
Lot Size:	Canopy Trees Required (Min. 3" caliper)
Less than 10,000 square feet	2
10,001-12,500	3
12,501 - 20,000	4

CURVE DATA

NO.	DELTA	RADIUS	TANGENT	LENGTH	CHORD	BEARING
C1	02-17-45	410.00'	8.22'	16.43'	16.43'	S34-56-36E
C2	11-38-38	410.00'	41.81'	83.32'	83.18'	S27-58-24E
C3	02-17-45	290.00'	5.81'	11.62'	11.62'	N34-56-36W
C4	11-38-38	290.00'	29.57'	58.94'	58.83'	N27-58-24W
C5	10-04-19	250.00'	22.03'	43.95'	43.89'	S31-03-19E
C6	10-04-19	130.00'	11.46'	22.85'	22.82'	S31-03-19E
C7	22-43-12	130.00'	26.12'	51.55'	51.21'	S14-39-33E
C8	22-28-27	140.00'	27.81'	54.91'	54.56'	N19-24-54W
C9	05-26-21	140.00'	6.65'	13.29'	13.29'	N33-22-18W
C10	27-11-08	100.00'	24.18'	47.45'	47.00'	S21-46-14E
C11	00-43-40	100.00'	0.64'	1.27'	1.27'	S35-43-38E
C12	13-28-00	1,150.51'	135.83'	270.41'	269.79'	N17-18-47W

MTEMC CERTIFICATE OF APPROVAL FOR RECORDING

Middle Tennessee Electric Membership Corporation (MTEMC) will provide electric service to the subject property according to the normal operating practices of MTEMC as defined in the rules and regulations, bylaws, policy bulletins and operational bulletins of MTEMC, and in accordance with the plat approval checklist, tree planting guidelines and other regulations contained on the MTEMC website at www.mtemc.com (collectively the "Requirements"). No electric service will be provided until MTEMC's Requirements have been met and approved in writing by an authorized representative of MTEMC. Any approval is, at all times, contingent upon continuing compliance with MTEMC's Requirements.

Middle Tennessee Electric Membership Corporation — Date

COF PROJECT # 6088

THE HIGHLANDS AT LADD PARK PUD SUBDIVISION, FINAL PLAT, Section 28

FRANKLIN, WILLIAMSON COUNTY, TENNESSEE

TOTAL ACRES: 6.651 TOTAL LOTS: 27
ACRES NEW STREETS: 0.78 FEET NEW STREETS: 843.8'±
CIVIL DISTRICT: 10TH CLOSURE ERROR: 1:10,000+
SCALE: 1"=100' DATE: 3-14-16

HFR PROJECT NO. 2014088-54

PREPARED BY:

HFR DESIGN
214 Centerview Drive Suite 300
Brentwood, TN 37027
615.370.8530
hfrdesign.com
615.370.8500
SURVEY DIVISION mwilliams@hfrdesign.com

Owner/Subdivider:
THE JONES COMPANY OF TENNESSEE, LLC
ATT. DAVID E. PITTA, DIRECTOR OF LAND ACQUISITION AND DEVELOPMENT
1221 LIBERTY PIKE
FRANKLIN, TN 37067
PH. 615-595-5439

G:\2015165\Survey\plat\2015165 ladd sec 28 plat.dwg, 4/7/2016 8:12:16 AM, DReagan, ARCH full bleed C (24.00 x 18.00 Inches), 1:100

COF no: 6089

CONDITIONS OF APPROVAL:

Performance Agreement and Surety

General Comments

1. Engineering Sureties

- Any unposted sureties associated with this development from site plan(s) 5901 shall be transferred to this final plat as a condition of approval. No action is necessary from applicant.

(Previous comment restated for informational purposes only, no response necessary.)

Planning

General Comments

2. Board of Zoning Appeals

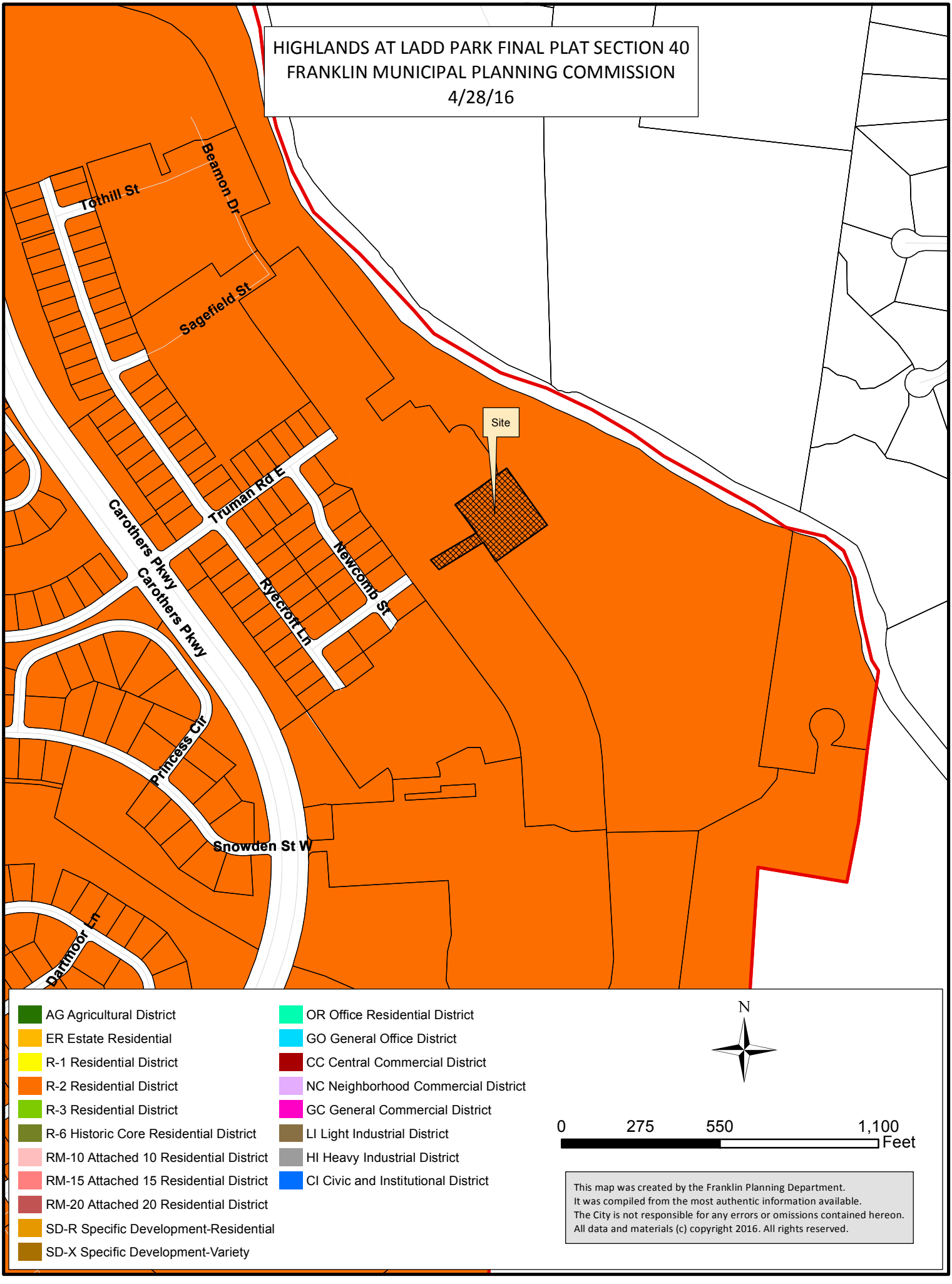
- The Plat cannot be recorded until the Board of Zoning Appeals has approved the adjusting of the FFO boundary.

3. One-Stop Procedure

- Due to the applicant's diligence in addressing staff comments and resolving most issues prior to resubmittal, this project is eligible for the One-Stop Post-PC review process. To participate in the One-Stop Post-PC process, the applicant must submit complete and corrected plans electronically through the IDT online review system by the scheduled One-Stop review date and be present at the One-Stop Center on the scheduled date and time that the One-Stop Post-PC service is available. The intent of One-Stop review is to close all outstanding conditions of approval and gain final document approval in an abbreviated time frame. Plans are reviewed on a first-come, first-serve basis in the One-Stop Center.

  - For eligible final plats, the applicant shall bring a mylar with all non-City Hall signatures provided. The applicant will also be required to establish required sureties prior to City Department signatures being applied. The sureties may be established after the one stop process.
  - In the case of site plans, the one stop process can only satisfy the City of Franklin review process. The review by State Authority and pre-construction meetings with staff in the field will still be required prior to the issue of stormwater and grading and/or utility construction permits.

If all conditions of approval have not been met at the scheduled One-Stop review, the applicant will be required to submit the project for additional review at another scheduled One-Stop date. The next available One-Stop Post-PC date is **[DATE]** and the applicant must check in at the One Stop center **between the hours of 8:00 and 11:00 a.m.** in order for their plans to be reviewed that day. The applicant may contact the Department of Building and Neighborhood Services with any questions regarding the process and for any future One-Stop Post-PC dates.


HIGHLANDS AT LADD PARK FINAL PLAT SECTION 40
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/16
Tothill St
Beamon Dr
Sagefield St
Site
Truman Rd E
Carothers Pkwy
Carothers Pkwy
Ryecroft Ln
Newcomb St
Princess Cir
Snowden St W
Dartmoor Ln
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
275
550
1,100
Feet
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It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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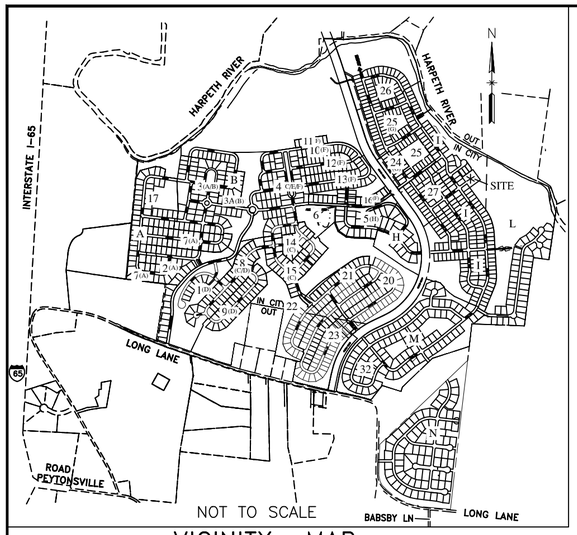


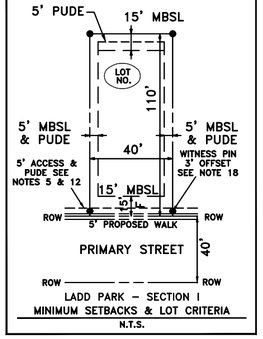
VICINITY MAP

NOTES:

1) THE PURPOSE OF THIS PLAT IS TO CREATE THE AMENITIES CENTER LOT FOR LADD PARK AND BEING KNOWN AS SECTION 40.
2) ALL DISTANCES WERE MEASURED WITH E.D.M. EQUIPMENT AND HAVE BEEN ADJUSTED FOR TEMPERATURE.
3) UTILITIES HAVE BEEN PLOTTED FROM SURFACE FEATURES FOUND AT THE TIME OF SURVEY AND AVAILABLE MAPS AND RECORDS. THERE MAY BE OTHER UTILITIES, THE EXISTENCE OF WHICH ARE NOT KNOWN TO THE UNDERSIGNED. SIZE AND LOCATION OF ALL UNDERGROUND UTILITIES MUST BE VERIFIED BY THE APPROPRIATE UTILITY COMPANY PRIOR TO ANY CONSTRUCTION.
4) BY SCALING, GRAPHIC INTERPOLATION AND PLOTTING THE SUBJECT PROPERTY IS LOCATED IN ZONE "X" "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN" AS SHOWN ON F.E.M.A. "FLOOD RATE INSURANCE MAP", MAP NO. 47187C0360F DATED: 9-29-06.
5) 5' DRAINAGE AND UTILITY EASEMENT ALONG ALL EXTERIOR BOUNDARY LINES AND ALONG ROAD RIGHT-OF-WAYS, AND 5' ALONG EACH SIDE OF INTERIOR LOT LINES.
6) 5/8" IRON RODS WITH CAPS (●) SET AT ALL CORNERS UNLESS OTHERWISE SHOWN.
7) WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES (INCLUDING CABLE TELEVISION, ELECTRICAL, NATURAL GAS SEWER, TELEPHONE AND WATER LINES) SHALL BE PLACED UNDERGROUND.
8) DEED REFERENCE FOR THE PROPERTY SURVEYED IS AS FOLLOWS: PORTION OF PARCEL 181.30, TEDEAN, LP IN BOOK 6296, PG. 979 ON TAX MAP 106.
9) STREET LIGHTS LOCATIONS AND QUANTITIES ARE APPROXIMATE. FINAL POSITIONING AND QUANTITY SHALL BE AT DIRECTION OF MTEMC.
10) THIS PROPERTY IS FOUND ON WILLIAMSON COUNTY TAX MAP 106.
11) THIS PROPERTY IS ZONED R2 AND GCCO-6/CONVENTIONAL; MINIMUM DEPTH=100', WIDTH AT SETBACK=63', SEE TYPICAL LOT DETAIL ON SHEET 1 FOR SPECIFIC SETBACK INFORMATION.
12) THE 5' ACCESS EASEMENTS (AE) AS SHOWN HEREON SHALL CONTAIN CONCRETE SIDEWALKS AND BE MAINTAINED BY THE HOA.
13) ALL OPEN SPACE IS PUBLIC UTILITY AND DRAINAGE EASEMENT (PUDE) AND SHALL BE MAINTAINED BY THE HOA. ALL DRAINAGE EASEMENTS SHALL BE MAINTAINED BY THE HOA. MAINTENANCE OF ALL STORMWATER MANAGEMENT FEATURES SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER(S) OR THE HOA.
14) CURRENT OWNER HAS NO KNOWLEDGE OF ANY ENTITY HAVING MINERAL RIGHTS TO THE SUBJECT PROPERTY.
16) THERE SHALL BE A 15' MIDDLE TENNEESEE ELECTRIC MEMBERSHIP CORPORATION EASEMENT ALONG ALL RIGHT-OF-WAYS CREATED HEREON, ACCEPT WHERE THERE IS A PROPOSED MILCROFTON UTILITY DISTRICT WATERLINE (SEE NOTE 17).
17) MILCROFTON UTILITY DISTRICT (MILCROFTON) HAS UNRESTRICTED ACCESS TO ITS WATER LINES AND WATER SYSTEM IMPROVEMENTS LOCATED WITHIN ITS EXCLUSIVE WATER LINE EASEMENTS WITHIN THE DEVELOPMENT. IN THE EVENT LANDSCAPING, FENCING OR OTHER STRUCRURES ARE INSTALLED OR PLACED WITHIN A MILCROFTON EASEMENT, MILCROFTON SHALL HAVE THE RIGHT TO REMOVE SUCH LANDSCAPING, FENCING OR OTHER STRUCTURE WITHIN THE EASEMENT AS MAY BE NECESSARY FOR MILCROFTON TO REPAIR, MAINTAIN, OR REPLACE ITS LINES, VALVES, APPLIANCES, FITTINGS OR OTHER WATER FACILITIES WHICH ARE NOW OR IN THE FUTURE WHICH MAY BE LOCATED WITHIN THE EASEMENT WITHOUT OBTAINING ANY FURTHER PERMISSION FROM DECLARANT OR SUBSEQUENT PROPERTY OWNERS. DECLARANT OR ASSOCIATION SHALL BE RESPONSIBLE FOR REPAIRING AND/OR REPLACING ANY SUCH LANDSCAPING, FENCING OR OTHER STRUCTURES REMOVED OR DISTURBED BY MILCROFTON AT THE DECLARANT'S OR ASSOCIATION'S EXPENSE IN COMMON OPEN SPACE LOTS AND IN AREAS OWNED BY THE DECLARANT OR ASSOCIATION. INDIVIDUAL HOMEOWNERS SHALL BE RESPONSIBLE FOR STRUCTURES REMOVED OR DISTURBED BY MILCROFTON AT THE HOMEOWNERS EXPENSE ON THE HOMEOWNER'S LOT DISTURBED BY MILCROFTON AT THE HOMEOWNERS EXPENSE ON THE HOMEOWNER'S LOT.
18) ALL CORNERS FALLING ALONG RIGHT OF WAY THAT FALL WITHIN THE PROPOSED CONCRETE WALKS AS SHOWN HEREON WILL BE SET 3' OFFSET FROM THE PROPERTY LINE BEHIND THE WALK AS A WITNESS PIN.

TYPICAL LOT DETAIL
N.T.S.

NOTE: Architectural Images Established in Sec. D, P. 19 of the approved Pattern Book.
Side Yard Setback (Corner Lot) 10'



LADD PARK - SECTION I
MINIMUM SETBACKS & LOT CRITERIA
N.T.S.

TYPICAL ROADWAY DETAIL
N.T.S.

2' CURB
5' GRASS STRIP
5' SIDEWALK

LEGEND

FIRE HYDRANT PROPOSED	
LIGHT POLE PROPOSED	
EXISTING POWER POLE	
CURB INLET PROPOSED	
IRON PIN FOUND	●(F)
5/8" IRON PIN SET THIS PLAT	●
UTILITY STUB OUT	○ ST
STREET ADDRESS	802
SEWER MANHOLE PROPOSED	○
PROPERTY/R.O.W. LINE	
PUBLIC UTILITY & DRAINAGE EASEMENT	PUDE
PROPOSED 16" WATER LINE	16" W
PROPOSED 8" SEWER LINE	8" S
PROPOSED 16" SEWER LINE	
PROPOSED CURB LINES	
SANITARY SEWER EASEMENT	20' SSE
MIILCROFTON EASEMENT SEE NOTE 17	MUDEE
ACCESS & PUBLIC UTILITY & DRAINAGE EASEMENT	5' AE & PUDE
HOME OWNERS ASSOCIATION EASEMENT	HOA ESMT
MIDDLE TENNESSEE ELECTRIC MEMBERSHIP CORPORATION EASEMENT SEE NOTE 16	15' MTE

MTEMC CERTIFICATE OF APPROVAL FOR RECORDING

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Middle Tennessee Electric Membership Corporation

GRAPHIC SCALE

60 0 30 60 120
(IN FEET)
1 inch = 60 ft.

S.P.C.S.

CERTIFICATE OF APPROVAL OF SUBDIVISION NAME, STREET NAMES AND ADDRESSING

Subdivision name and street names approved by the Williamson County Emergency Management Agency.

Date

Williamson County Emergency Management Agency — Date

City of Franklin, Tennessee — Date

CERTIFICATE OF OWNERSHIP

I (We) hereby certify that I am (we are) the owner(s) of the property shown hereon (SEE NOTE 8) and adopt the plan of subdivision of the property shown hereon and dedicate all public ways and easements as noted. No lot(s) as shown hereon shall again be subdivided, resubdivided, altered, or changed so as to produce less area than is hereby established until otherwise approved by the Franklin Municipal Planning Commission, and under no condition shall such lot(s) be made to produce less area than is perscribed by the restrictive covenants as of record in Book_____, Page_____, R.O.W.C., Tennessee, running with the title to the property I (We) further certify that there are no leins on this property, except as follows:

Book_____, Page_____, R.O.W.C., Tennessee.

By: _____ Date: _____

PAUL ARNOLD TEDEAN, L.P. (PARTNER) (SEE NOTE 8)

CERTIFICATE OF APPROVAL OF WATER AND SEWER SYSTEMS

I hereby certify that:
(1) the sewer systems designated in HIGHLANDS AT LADD PARK PUD SUBDIVISION, SECTION 40, Subdivision have been installed in accordance with City specifications, or
(2) a performance agreement and surety in the amount of $_____ for the sewer system has been posted with the City of Franklin, Tennessee, to assure completion of such systems.

Director Sewer Management Department City of Franklin, TN — Date

(Where applicable)

(3) a performance bond in the amount of $_____ for the on site water system and/or $_____ for off-site water system has been posted with the Milcrofton Utility District to assure completion of such systems.

General Manger Milcrofton Utility District — Date

CERTIFICATE OF APPROVAL OF STREETS, DRAINAGE AND SIDEWALKS

I hereby certify that:
(1) the streets, drainage and sidewalks designated in THE HIGHLANDS AT LADD PARK PUD SUBDIVISION, SECTION 40, have been installed in accordance with City specifications, or

(2) a performance agreement and surety in the amount of $_____ for streets, $_____ for drainage and $_____ for sidewalks has been posted with the City of Franklin, Tennessee to assure completion of such improvements.

Director Streets Department City of Franklin, Tennessee — Date

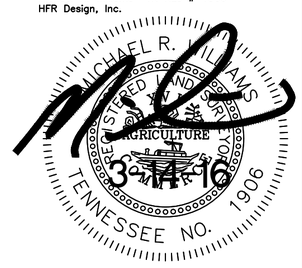
CERTIFICATE OF APPROVAL FOR RECORDING

Approved by the Franklin Municipal Planning Commission, Franklin, Williamson County, Tennessee, with the exception of such conditions, if any, as are noted in the Planning Commission minutes for the _____ day of _____, 20____, and this plat has been approved for

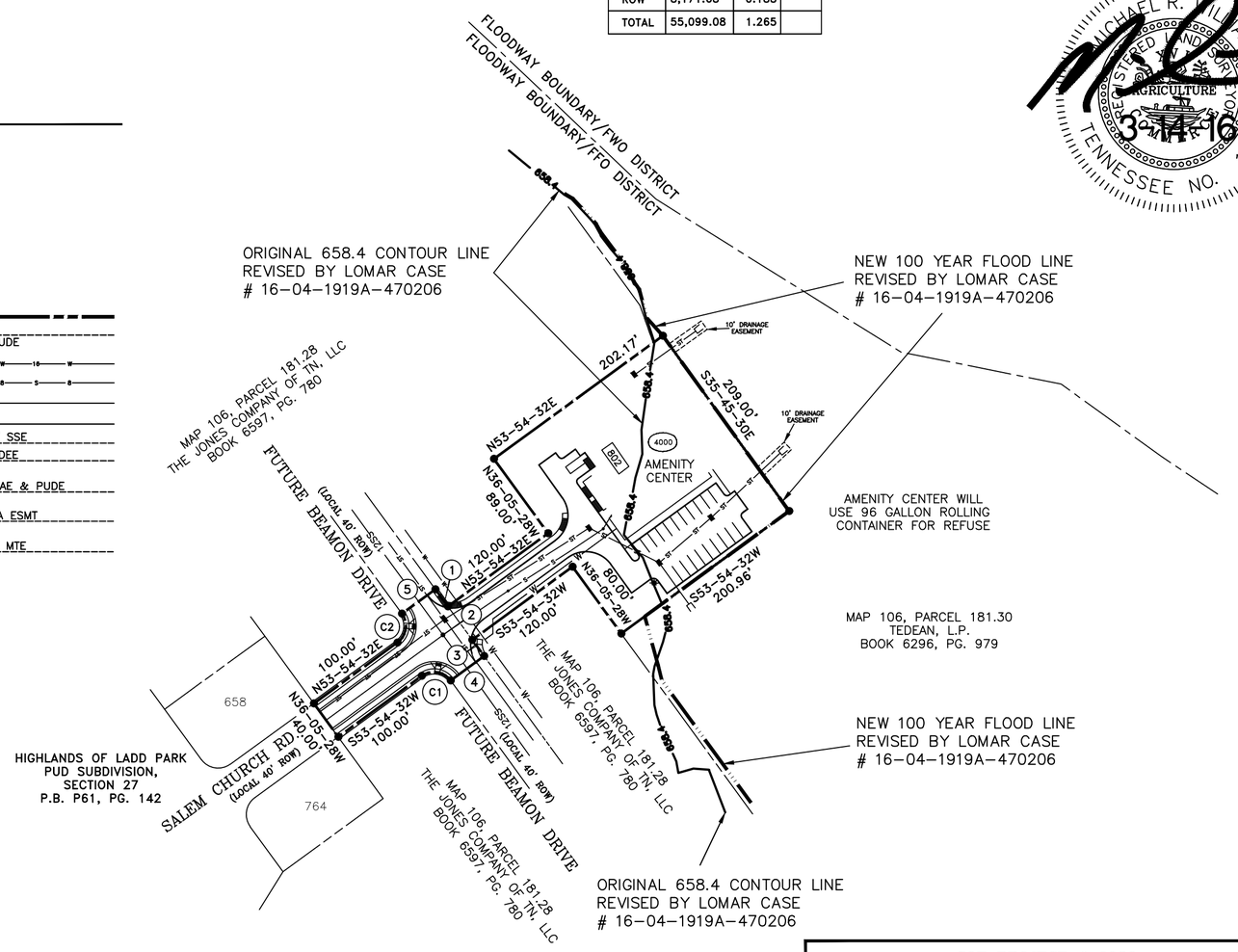
CERTIFICATE OF SURVEY

I (We) hereby certify that the subdivision plat as shown hereon is correct and that all of the monuments shown hereon have been placed as indicated. This subdivision plat correctly represents a survey made under my supervision on the _____ day of _____, 20____

Michael R. Williams TN RLS # 1906
HFR Design, Inc.



LOT AREA TABLE			REQUIRED # OF 3" CALIPER TREES PER LOT
LOT NO.	SQ. FT.	ACRES	3" TREES
4000	46,927.40	1.077	2
ROW	8,171.68	0.188	
TOTAL	55,099.08	1.265	



SINGLE FAMILY LOT PLANTING REQUIREMENTS: The following canopy trees are required for each single-family lot: There shall be a total of 96 trees required in Section 27.	
Lot Size:	Canopy Trees Required (Min. 3" caliper)
Less than 10,000 square feet	2
10,001-12,500	3
12,501 - 20,000	4

LINE TABLE

NO.	BEARING	DIST.
1	S36-05-28E	20.50'
2	S36-05-28E	40.00'
3	S36-05-28E	19.50'
4	S53-54-32W	40.00'
5	N53-54-32E	40.00'

CURVE DATA

NO.	DELTA	RADIUS	TANGENT	LENGTH	CHORD	BEARING
C1	90-00-00	20.00'	20.00'	31.42'	28.28'	N81-05-28W
C2	90-00-00	20.00'	20.00'	31.42'	28.28'	N08-54-32E

PREPARED BY:

HFR DESIGN
214 Centerview Drive Suite 300
Brentwood, TN 37027
615.370.8530
615.370.8500
hfrdesign.com
SURVEY DIVISION mwilliams@hfrdesign.com

Owner/Subdivider:
TEDEAN L.P.
ATT. PAUL ARNOLD
317 MAIN ST. SUITE 201
FRANKLIN, TN 37064
PH. 604-4197
parnold@trillium-ventures.com

COF PROJECT # 6089

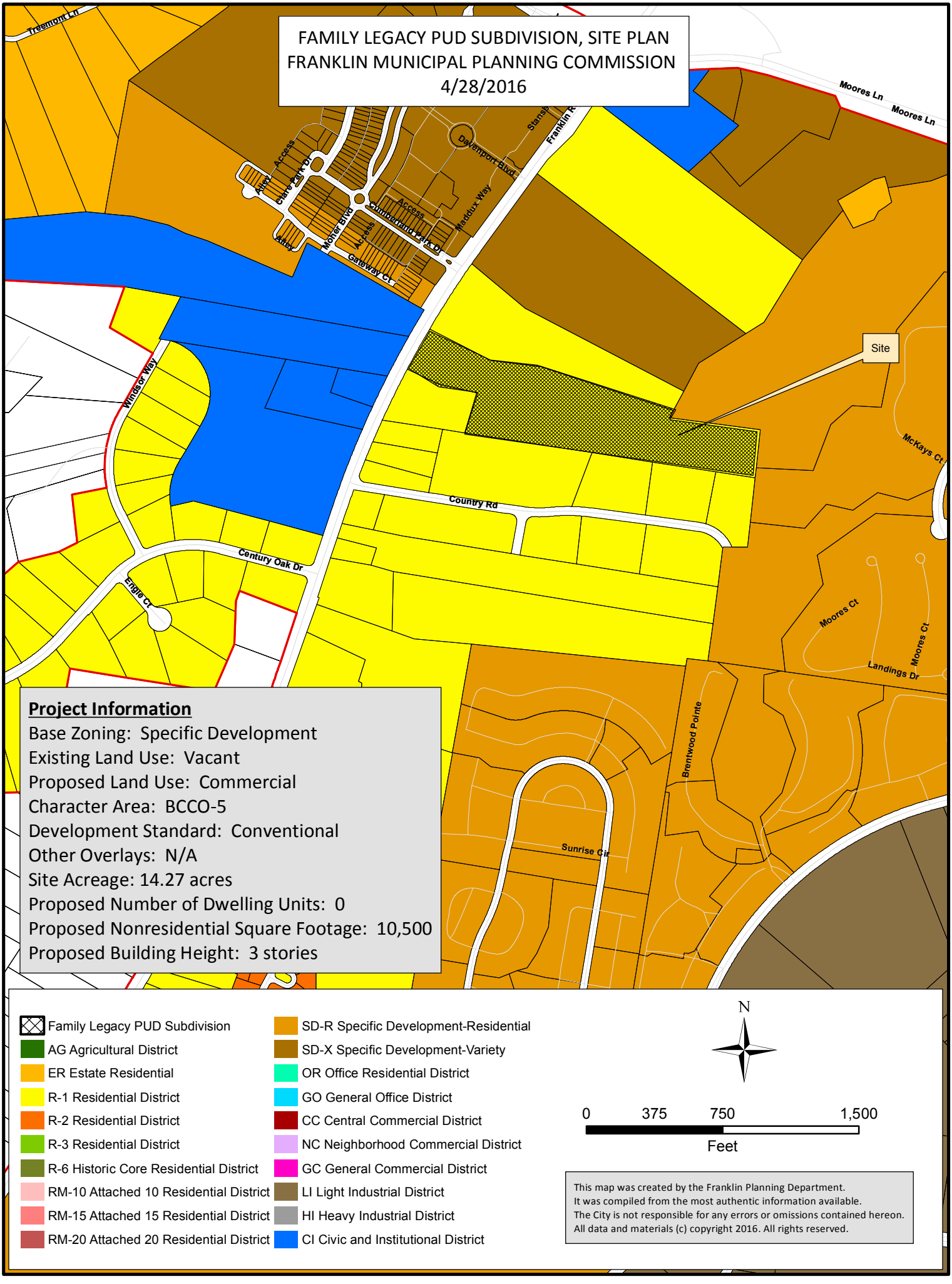
THE HIGHLANDS AT LADD PARK PUD SUBDIVISION, FINAL PLAT, Section 40 (THE AMENITIY CENTER)

FRANKLIN, WILLIAMSON COUNTY, TENNESSEE

TOTAL ACRES: 1.265 TOTAL LOTS: 1
ACRES NEW STREETS: 0.188 FEET NEW STREETS: 240'±
CIVIL DISTRICT: 10TH CLOSURE ERROR: 1:10,000+
SCALE: 1"=100' DATE: 3-14-16

HFR PROJECT NO. 2014088-54

G:\2015166\Survey\ladd sec 40 plat\2015166-sec 40 plat amenities center.dwg, 4/7/2016 7:51:38 AM, DReagan, ARCH full bleed C (24.00 x 18.00 Inches), 1:100


FAMILY LEGACY PUD SUBDIVISION, SITE PLAN
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/2016
Moores Ln
Moores Ln
Site
Country Rd
Century Oak Dr
Windsor Way
Eagle Ct
McKays Ct
Moores Ct
Moores Ct
Landings Dr
Brentwood Pointe
Sunrise Cir
Davenport Blvd
Maddux Way
Cumberland Park Dr
Gateway Ct
Motor Blvd
Clare Park Dr
Alley
Access
Tremont Ln
Project Information
Base Zoning: Specific Development
Existing Land Use: Vacant
Proposed Land Use: Commercial
Character Area: BCCO-5
Development Standard: Conventional
Other Overlays: N/A
Site Acreage: 14.27 acres
Proposed Number of Dwelling Units: 0
Proposed Nonresidential Square Footage: 10,500
Proposed Building Height: 3 stories
Family Legacy PUD Subdivision
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
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N
0
375
750
1,500
Feet
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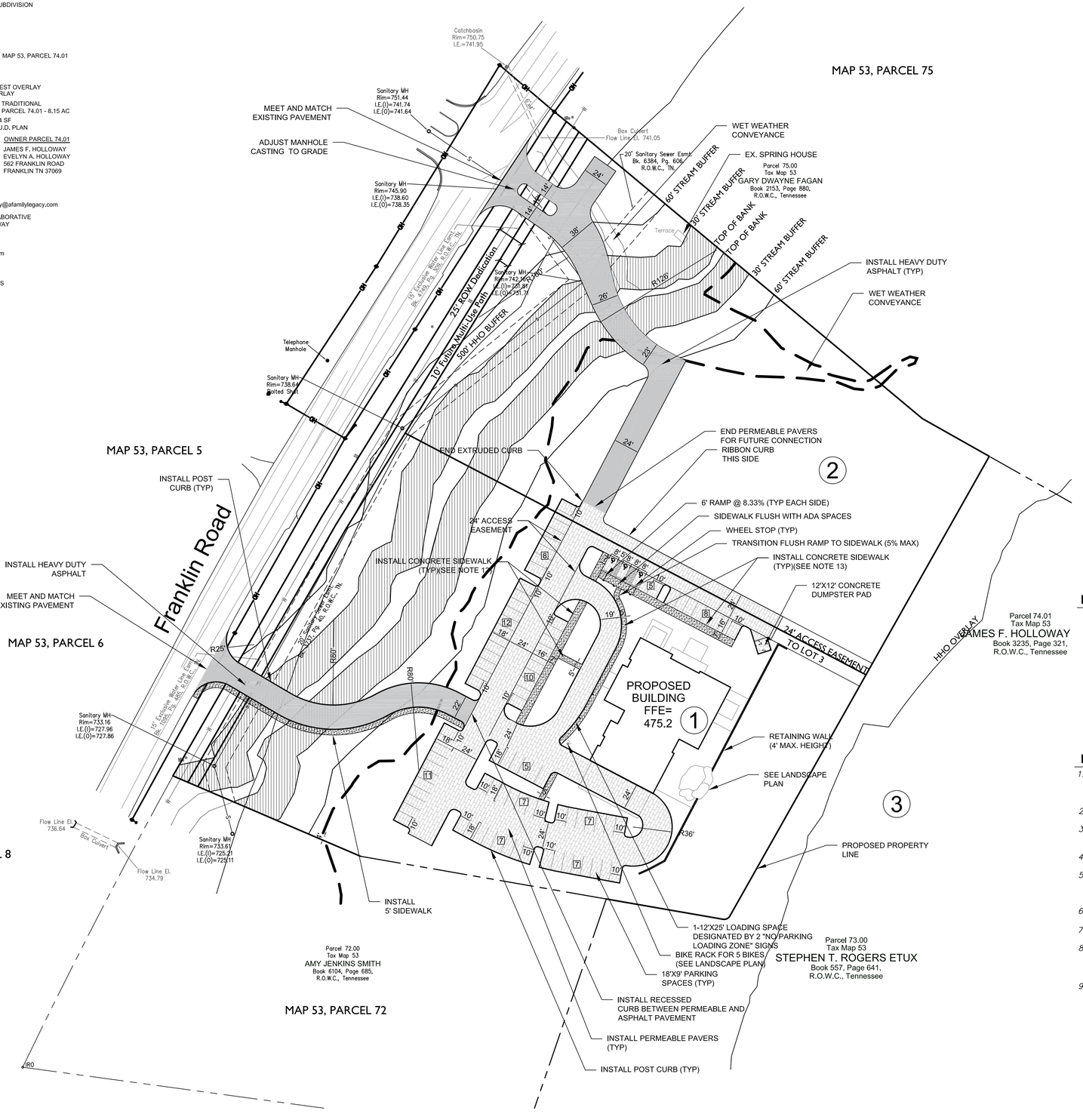
SITE DATA:

PROJECT NAME:	FAMILY LEGACY PUD SUBDIVISION
PROJECT NUMBER:	6072
SUBDIVISION:	FAMILY LEGACY PUD SUBDIVISION
LOT NUMBER:	1
ADDRESS:	554 FRANKLIN ROAD
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 53, PARCEL 73.00 MAP 53, PARCEL 74.01
EXISTING ZONING:	R1
PROPOSED ZONING:	SD-X 0/34.500
CHARACTER AREA OVERLAY:	BERRYS CHAPEL BC-4
OTHER APPLICABLE OVERLAYS	HHO - HILLSIDE/HILLCREST OVERLAY FWO - FLOODWAY OVERLAY
APPLICABLE DEVELOPMENT STANDARD:	TRADITIONAL TRADITIONAL
PARCEL ACREAGE:	PARCEL 73 - 14.57 AC PARCEL 74.01 - 8.15 AC
TOTAL ACREAGE/SQUARE FOOTAGE:	22.72 ACRES OR 989,504 SF
MINIMUM REQUIRED SETBACKS:	AS ESTABLISHED BY P.U.D. PLAN

OWNER PARCEL 73	OWNER PARCEL 74.01
STEPHEN T. ROGERS	JAMES F. HOLLOWAY
ETHEL R. DETCH	EVELYN A. HOLLOWAY
554 FRANKLIN ROAD	562 FRANKLIN ROAD
FRANKLIN TN 37069	FRANKLIN TN 37069

APPLICANT:	WILLIAM GREGORY 7427 CHARLOTTE PIKE NASHVILLE TN, 37209 (615) 390-7724 WGregory@afamilylegacy.com
PLANNER/LANDSCAPE ARCHITECT:	GAMBLE DESIGN COLLABORATIVE
ADDRESS	144 SOUTHEAST PARKWAY SUITE 200 FRANKLIN, TN 37064
OFFICE PHONE	615.975.5765
EMAIL ADDRESS	greggamble209@gmail.com
CONTACT	GREG GAMBLE

LOT 1	
PROPOSED LOT SIZE	165,568 SF or 3.80 ACRES
PROPOSED USE	FUNERAL HOME
BUILDING SQUARE FOOTAGE	10,500 SF
BUILDING HEIGHT	ONE STORY
MINIMUM L.S.R.	0.20
L.S.R. PROVIDED	0.668
INCOMPATIBLE BUFFER REQUIRED	NONE
MINIMUM VEHICLE PARKING REQUIRED BY APPROVED DEV. PLAN	86
MAXIMUM PARKING PERMITTED	108
PARKING PROVIDED	82
BIKE PARKING REQUIRED BY APPROVED DEV. PLAN	5
BIKE PARKING PROVIDED WITH THIS PLAN	5



SITE CONSTRUCTION NOTES

1. THE NECESSARY PERMITS FOR THE WORK SHOWN ON THESE SITE DEVELOPMENT PLANS WILL BE OBTAINED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK ON THIS PROJECT. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES AND OBTAIN ALL PERMITS AND PAY ALL FEES INVOLVED IN SECURING SAID PERMITS. HE SHALL ALSO COMPLY WITH ALL CITY, COUNTY AND STATE BUILDING LAWS, ORDINANCES OR REGULATIONS RELATING TO THE CONSTRUCTION OF PROJECTS SUCH AS THIS ONE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND SHALL BEAR ALL EXPENSES OF FIELD STAKING NECESSARY FOR SITE AND BUILDING LAYOUT. ALL LAYOUT SHALL BE PERFORMED IN ACCORDANCE WITH DETAIL PLANS AS OUTLINED IN THE SITE LAYOUT PLAN.
3. THE LOCATION OF EXISTING PIPING AND UNDERGROUND UTILITIES, SUCH AS WATER AND GAS LINES, ELECTRICAL AND TELEPHONE CONDUITS, ETC., AS SHOWN ON THIS PORTION OF THE PLANS HAVE BEEN DETERMINED FROM THE BEST AVAILABLE INFORMATION BY ACTUAL SURVEYS, OR TAKEN FROM THE RECORDS AND DRAWINGS OF THE EXISTING UTILITIES. HOWEVER, THE CIVIL ENGINEER DOES NOT ASSUME RESPONSIBILITY THAT, DURING CONSTRUCTION, THE POSSIBILITY OF UTILITIES OTHER THAN THOSE SHOWN MAY BE ENCOUNTERED OR THAT ACTUAL LOCATION OF THOSE SHOWN MAY VARY SOMEWHAT FROM THE LOCATION DESIGNATED ON THIS PORTION OF THE PLANS. IN AREAS WHERE IT IS NECESSARY THAT THE EXACT LOCATIONS OF UNDERGROUND LINES BE KNOWN, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, FURNISH ALL LABOR AND TOOLS TO EITHER VERIFY AND SUBSTANTIATE OR DEFINITELY ESTABLISH THE LOCATION OF THE LINES.
4. THE CONTRACTOR MUST UNDERSTAND THAT THE WORK IS ENTIRELY AT HIS RISK UNTIL SAME IS ACCEPTED AND HE WILL BE HELD RESPONSIBLE FOR ITS SAFETY BY THE OWNER. THEREFORE, THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY TEMPORARY WORKS FOR THE PROTECTION OF THE WORK, INCLUDING BARRICADES, WARNING SIGNS, AND LIGHTS.
5. IF, DURING THE CONSTRUCTION OF THE SITE DEVELOPMENT PORTION OF THIS PROJECT, A QUESTION OF INTENT OR CLARITY ARISES FROM EITHER THE PLANS OR SPECIFICATIONS, THE CONTRACTOR WILL IMMEDIATELY BRING THE MATTER TO THE ATTENTION OF THE CIVIL ENGINEER FOR RESOLUTION BEFORE THE AFFECTED WORK ITEMS ARE INITIATED OR PURSUED FURTHER.
6. THE CONTRACTOR WILL EXERCISE EXTREME CAUTION IN THE USE OF EQUIPMENT IN AND AROUND OVERHEAD POWER LINES. IF AT ANY TIME IN THE PURSUIT OF THIS WORK THE CONTRACTOR MUST WORK IN CLOSE PROXIMITY OF THE ABOVE-NOTED LINES, THE ELECTRIC AND/OR TELEPHONE COMPANIES SHALL BE CONTACTED PRIOR TO SUCH WORK AND THE PROPER SAFETY MEASURES TAKEN. A THOROUGH EXAMINATION OF THE OVERHEAD LINES IN THE PROJECT AREA SHOULD BE MADE BY THE CONTRACTOR PRIOR TO THE INITIATION OF CONSTRUCTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO THE PREMISES OR ADJACENT PREMISES, OR INJURIES TO THE PUBLIC DURING THE CONSTRUCTION OF THE WORK, CAUSED BY HIMSELF, HIS SUBCONTRACTORS OR THE CARELESSNESS OF ANY OF HIS EMPLOYEES.
8. TOPSOIL STRIPPED FROM THE AREAS TO BE GRADED WILL BE STOCKPILED ON SITE, AT A SPOT TO BE AUTHORIZED BY THE CIVIL ENGINEER, AND SHALL LATER BE USED FOR FINAL DRESSING AND SEEDBED PREPARATION, SAID STOCKPILES WILL BE LOCATED SO AS NOT TO INTERFERE WITH ACTIVITIES OF OTHER PORTIONS OF THE WORK ON THE PROJECT.
9. THE STOCKPILING OR STORAGE OF TREES, VEGETATION AND OTHER DELETERIOUS MATTER OR MATERIALS DEEMED "UNSUITABLE" BY THE SOILS AND CIVIL ENGINEERS SHALL NOT BE ALLOWED ON SITE. SAID MATERIALS SHALL BE PROPERLY DISPOSED OF OFF THE PROPERTIES, THE COST AND RESPONSIBILITY OF WHICH SHALL BE THE CONTRACTOR'S. SITE FOR THE DISPOSAL OF SAID MATERIALS SHALL FIRST BE APPROVED BY THE CIVIL ENGINEER.
10. THE PLACING AND SPREADING OF ANY FILL MATERIAL IS TO BE STARTED AT THE LOWEST POINT AND BROUGHT UP IN HORIZONTAL LAYERS OF 8-INCH THICKNESS. SAID FILL MATERIAL IS TO BE FREE OF SOD, ROOTS, FROZEN SOILS, OR ANY OTHER DECOMPOSABLE MATERIAL. THE RELATIVE COMPACTION OF EACH LAYER SHALL NOT BE LESS THAN 95 % OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698) IN ALL AREAS OF FILL, AND COMPACTION OF 98% OF SAME SPECIFICATION FOR MATERIALS USED IN THE UPPER 24 INCHES BENEATH PAVEMENT AND GRADE SLABS.
11. ALL STORM DRAINAGE STRUCTURES SHALL BE PRECAST CONCRETE WITH STEEL REINFORCEMENT PER T.D.O.T. STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED. ALL STORM DRAINAGE CASTINGS TO BE JOHN BOUCHARD & SONS OR APPROVED EQUAL.
12. ALL RADII AT INTERNAL ISLANDS ARE 3'. OTHER RADII ARE 5' UNLESS NOTED.
13. CONCRETE WALKS WHERE CURB IS INDICATED ARE TO BE TURNDOWN SIDEWALKS. CONCRETE WALKS ADJACENT TO GRASS DO NOT REQUIRE TURNDOWN.
14. ALL PERMEABLE PAVERS TO BE PLACED IN A WATER QUALITY/DETENTION EASEMENT ON FINAL PLAT.

PAVEMENT LEGEND:

- CONCRETE PAVEMENT
- HEAVY DUTY ASPHALT PAVEMENT
- CONCRETE SIDEWALK
- PERMEABLE PAVEMENT

PROJECT GENERAL NOTES:

1. *THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES IN THE PROXIMITY OF THE CONSTRUCTION AREA AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE AND PROJECT CONSULTANTS PRIOR TO BEGINNING WORK.*
2. *THE CONTRACTOR SHALL CONFORM TO ALL LOCAL, STATE AND FEDERAL CODES AND OBTAIN ALL PERMITS PRIOR TO BEGINNING WORK.*
3. *THE CONTRACTOR SHALL CHECK ALL FINISHED GRADES AND DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE AND PROJECT CONSULTANTS PRIOR TO BEGINNING WORK.*
4. *DIMENSIONS ARE TO THE FACE OF CURB, EDGE OF CONCRETE AND FACE OF BUILDING, UNLESS NOTED OTHERWISE.*
5. *PROPOSED BUILDING FOOTPRINT IS FOR GRAPHIC PURPOSES ONLY. CONTRACTOR SHALL USE THE CURRENT ARCHITECTURAL DRAWINGS FOR BUILDING LOCATION AND VERIFY THAT THERE ARE NO DISCREPANCIES WITH THESE PLANS.*
6. *ALL TRAFFIC MARKINGS SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICE (MUTCD).*
7. *ALL HANDICAP RAMPS, PARKING SPACES AND ACCESSIBLE ROUTES SHALL COMPLY WITH THE CURRENT ADA REQUIREMENTS.*
8. *EXTERIOR DOOR LANDINGS SHALL BE PROVIDED PER THE STATE AND LOCAL BUILDING CODE. CONTRACTOR SHALL COORDINATE DOOR LOCATIONS AND ADJACENT SIDEWALK/LANDING GRADES WITH THESE PLANS AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE AND PROJECT CONSULTANTS.*
9. *THE SURVEY IS BASED ON TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FIPSZONE 4100, NAD 83 DATUM.*

Know what's **below.** **Call** before you dig.

NORTH

50 0 25 50 100

GRAPHIC SCALE - 1 inch = 50 ft.

GARY LYNN EADY — REGISTERED LANDSCAPE ARCHITECT — STATE OF TENNESSEE

4/7/2016

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

Being Parcels 73.00 & 74.01 on Tax Map 53
554 FRANKLIN ROAD
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

- PLAN DATE: March 7, 2016
- PLAN REVISION DATE: April 7, 2016

A NONE
B NONE
C NONE
D NONE

SITE PLAN

C2.0

4 of 14

1 SOUTH ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'

2 EAST ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'

THESE ELEVATIONS HAVE BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN'S ARCHITECTURAL DESIGN STANDARDS AND TO MEET THE APPROVAL OF THE PLANNING COMMISSION AND SECTION 5.3 OF THE ZONING ORDINANCE. CHANGES SHALL NOT BE MADE TO THE APROVED ELEVATIONS UNLESS APPROVED BY EITHER THE BNS/CODES DIRECTOR OR THE PLANNING COMMISSION.

FRANKLIN CODES DEPARTMENT (615) 794-7012
FRANKLIN PLANNING DEPARTMENT (615) 791-3212

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

906 STUDIO ARCHITECTS
MICHAEL A. HATHWAY
1417 Fifth Avenue South
Franklin, TN 37064
615.599.0906
906studio.com

A Family Legacy Subdivision

Building Elevations

Being Parcels 73.00 & 74.01 on Tax Map 53
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

- PLAN DATE: November 11, 2015
- ELEVATION DATE: March 14, 2016

MICHAEL A. HATHWAY
REGISTERED ARCHITECT
No. 20001
STATE OF TENNESSEE
3/14/16

BUILDING ELEVATIONS

A3.0

1 NORTH ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'

2 WEST ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'

THESE ELEVATIONS HAVE BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN'S ARCHITECTURAL DESIGN STANDARDS AND TO MEET THE APPROVAL OF THE PLANNING COMMISSION AND SECTION 5.3 OF THE ZONING ORDINANCE. CHANGES SHALL NOT BE MADE TO THE APROVED ELEVATIONS UNLESS APPROVED BY EITHER THE BNS/CODES DIRECTOR OR THE PLANNING COMMISSION.

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Building Elevations

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ISSUANCE/REVISION NOTES:

- PLAN DATE: November 11, 2015
- ELEVATION DATE: March 14, 2016

MICHAEL A. HATHWAY
REGISTERED ARCHITECT
No. 20001
STATE OF TENNESSEE
3/14/16

BUILDING ELEVATIONS

A4.0

SHEET 4OF 4

COF no: 6072

CONDITIONS OF APPROVAL:

Engineering - Site Plan Checklist

General Comments

1. I. Grading Plan

- The previous comment "Applicant shall provide existing and proposed site topography with clear contour labels (minimum 2' contours). Post-development contours must tie to existing within limits of disturbance. Contours within the site must be continuous or connect to a wall. Aerial topography shall not be used as the basis of design for site work or to establish existing elevations for construction purposes." was not completely addressed. Proposed contours are mislabeled or contour 46 is not shown on the southeast portion of the site. Provide proposed contours for the Aqua Arch approaches and the connection to Franklin Road. Provide spot elevations for the drive over the box culvert. The drive must extend to the northern boundary of the site. Provide proposed elevations for the drive at the property boundary. Provide proposed top of casting elevations for the existing sewer manholes in the drive.

2. I. Grading Plan

- The previous comment "Applicant shall clearly indicate the limits of disturbance on the grading plan. Provide documentation that the grading proposed on the adjacent property meets the approval of the property owner." was not completely addressed. Provide a legend on the grading plan for limits of disturbance, tree protection, swale etc. Extend the aqua arch walls beyond the stream buffer and remove grading from the stream buffer. Grading for the wet weather conveyance relocation must not disturb the stream buffer. Concentrated stormwater flow must not flow into the stream buffer. Provide permanent erosion protection and a level spreader for outlet 1 and any other concentrated stormwater flow.

3. Availability Request

- Availability Request has not been received. Please complete the form and email to Amanda Ray.

4. V. Site Permits

- The Stormwater/Grading permit application has been uploaded to the document manager. Please have the application completed and submit with ORIGINAL, signed and notarized Agreement and Fees (listed on permit) to Engineering.

* for information only*

Fire-Planning

Family Legacy Lot 1 Site Plan - Pre-App Set 1-22-16.pdf

5. Fire Protection

- Utility Sheet C4.0 has been revised to more clearly indicate the proposed layout of water utilities including the identification of the 6" water line for fire protection, a proposed fire hydrant, the fire department connection (FDC) and "DDCV and RPBP inside building."

However, there is no labeling for what appears to be a fire flow meter (details on C6.3). The applicant shall provide proper labeling to indicate the fire meter.

Additionally, Mallory Valley and other utility providers require an external backflow when a private fire hydrant is to be installed. No symbol or description for the required external fire line backflow was found on C4.0 and no external backflow detail was found on C6.3.

The applicant shall include the required external reduced pressure backflow equipment and enclosure on the Utility sheet (C4.0) as well as the Mallory Valley detail.

6. Fire Protection

- The applicant has not fully addressed this comment originally made on 2/2/2016: "Please provide the results from a fire demand flow test from the nearest fire hydrants. A two-hydrant test is standard. Flow results will be compared to the minimum flow requirements in the International Fire Code."

The applicant shall provide the results of a two-hydrant test along with the test date, location of the hydrants used, time of the test, including who performed and witnessed the test. The test date must be within the immediately preceding six months as of the most recent submittal date.

Performance Agreement and Surety

General Comments

7. Engineering Sureties

Applicant shall post sureties in the following amounts:

III. City Streets: $ 23,000
IV: Private Streets: $ 141,000
VI. Public Sidewalks: $ 25,000
VII. Stormwater Drainage: $ 145,000 (Includes construction of bridge/culverts)
VIII. Green Infrastructure: $ 642,000

8. Landscape

- Landscape surety $40,000.00

Planning

General Comments

9. One-Stop Procedure

- Due to the applicant's diligence in addressing staff comments and resolving most issues prior to resubmittal, this project is eligible for the One-Stop Post-PC review process. To participate in the One-Stop Post-PC process, the applicant must submit complete and corrected plans electronically through the IDT online review system by the scheduled One-Stop review date and be present at the One-Stop Center on the scheduled date and time that the One-Stop Post-PC service is available. The intent of One-Stop review is to close all outstanding conditions of approval and gain final document approval in an abbreviated time frame. Plans are reviewed on a first-come, first-serve basis in the One-Stop Center.

  - For eligible final plats, the applicant shall bring a mylar with all non-City Hall signatures provided. The applicant will also be required to establish required sureties prior to City Department signatures being applied. The sureties may be established after the one stop process.
  - In the case of site plans, the one stop process can only satisfy the City of Franklin review process. The review by State Authority and pre-construction meetings with staff in the field will still be required prior to the issue of stormwater and grading and/or utility construction permits.

If all conditions of approval have not been met at the scheduled One-Stop review, the applicant will be required to submit the project for additional review at another scheduled One-Stop date. The next available One-Stop Post-PC date is **5/4/2016** and the applicant must check in at the One Stop center **between the hours of 8:00 and 11:00 a.m.** in order for their plans to be reviewed that day. The applicant may contact the Department of Building and Neighborhood Services with any questions regarding the process and for any future One-Stop Post-PC dates.

Family Legacy first submittal 3.14.2016.pdf

10. FWO and FFO

- Applicant shall:

1. Create Open Space lot (Lot #4) between Franklin Road and the developing portion of the site.
2. Label newly created open space lot as lot #4 on all sheets.
3. Ensure Stream, floodplain, and FFO boundaries are all contained within the newly created lot under steps one and two above.
4. Ensure every sheet displays this information correctly with the resubmitted site plan.
5. Ensure final plat displays this four lot configuration as well.

11. Site Data Chart

- Applicant shall correct existing zoning IN ALL SITE DATA CHARTS to:

Existing Zoning is: SD-X 0/34,500

and remove reference to proposed zoning. There is no zoning changes proposed with this site plan.

Stormwater

General Comments

12. Permits

- Comment to remain open until ARAP NOC provided to staff.

13. EPSC

- Comment not fully addressed. EPSC measures shall be clearly shown on plans for both stream crossings.

14. Stream Buffer

- Comment shall remain open until addressed.

15. EPSC

- Comment not fully addressed. EPSC measures shall be clearly shown on plans for both stream crossings and channel relocations.

16. Long Term Maintenance Plan

- Complete page 1 and 2 of LTMP. Check all BMP located onsite including riparian buffers and include any applicable inspection sheets. Include sheet L2.0

17. Pervious Concrete/Pavers

- This can be found at

http://www.franklintn.gov/government/engineering/stormwater/construction-development/stormwater-standard-drawings

Water/Sewer

General Comments

18. Sanitary Sewer Tap

- Applicant did not address current issues, applicant shall revise as noted below:
  - A cleanout shall be added on the plans at the edge of the sanitary sewer easement.
  - The location and size of the existing sanitary sewer service shall be shown on plan to ensure there are no conflicts.
  - Applicant shall show the existing sewer taps on the property not being utilized and contractor shall terminate at the main line. This information shall be shown on the utility plan and demolition plan.

19. Sewer revision

- The landscape sheet currently has water meters and service boxes over sewer line. The proposed landscape sheet shall reflect correct utilities.

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

COF# 6072

Being Parcels 73.00 and 74.01 on Tax Map 53

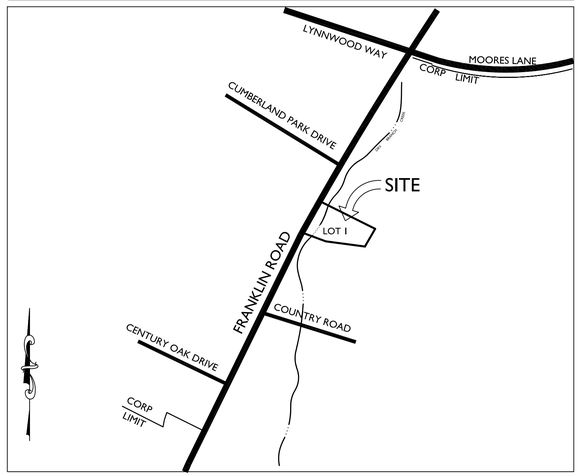
554 Franklin Road

Franklin, Williamson County, Tennessee

SHEET SCHEDULE:

1	C0.0	COVER SHEET
2	C1.0	EXISTING CONDITIONS
3	C1.1	DEMOLITION PLAN
4	C2.0	SITE PLAN
5	C3.0	GRADING AND DRAINAGE PLAN
6	C3.1	INITIAL EROSION CONTROL PLAN
7	C3.2	INTERMEDIATE EROSION CONTROL PLAN
8	C3.3	FINAL EROSION CONTROL PLAN
9	C4.0	UTILITY PLAN
10	C5.0	AUTOTURN PLAN
11	C6.0	DETAIL SHEET
12	C6.1	DETAIL SHEET
13	C6.2	DETAIL SHEET
14	C6.3	DETAIL SHEET

SITE LOCATION MAP:



GARY LYNN EARLY
REGISTERED LANDSCAPE ARCHITECT
STATE OF TENNESSEE
4/7/2016

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

FAMILY LEGACY PUD SUBDIVISION
Site Plan - Lot 1 (Funeral Home)
Being Parcels 73.00 & 74.01 on Tax Map 53
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

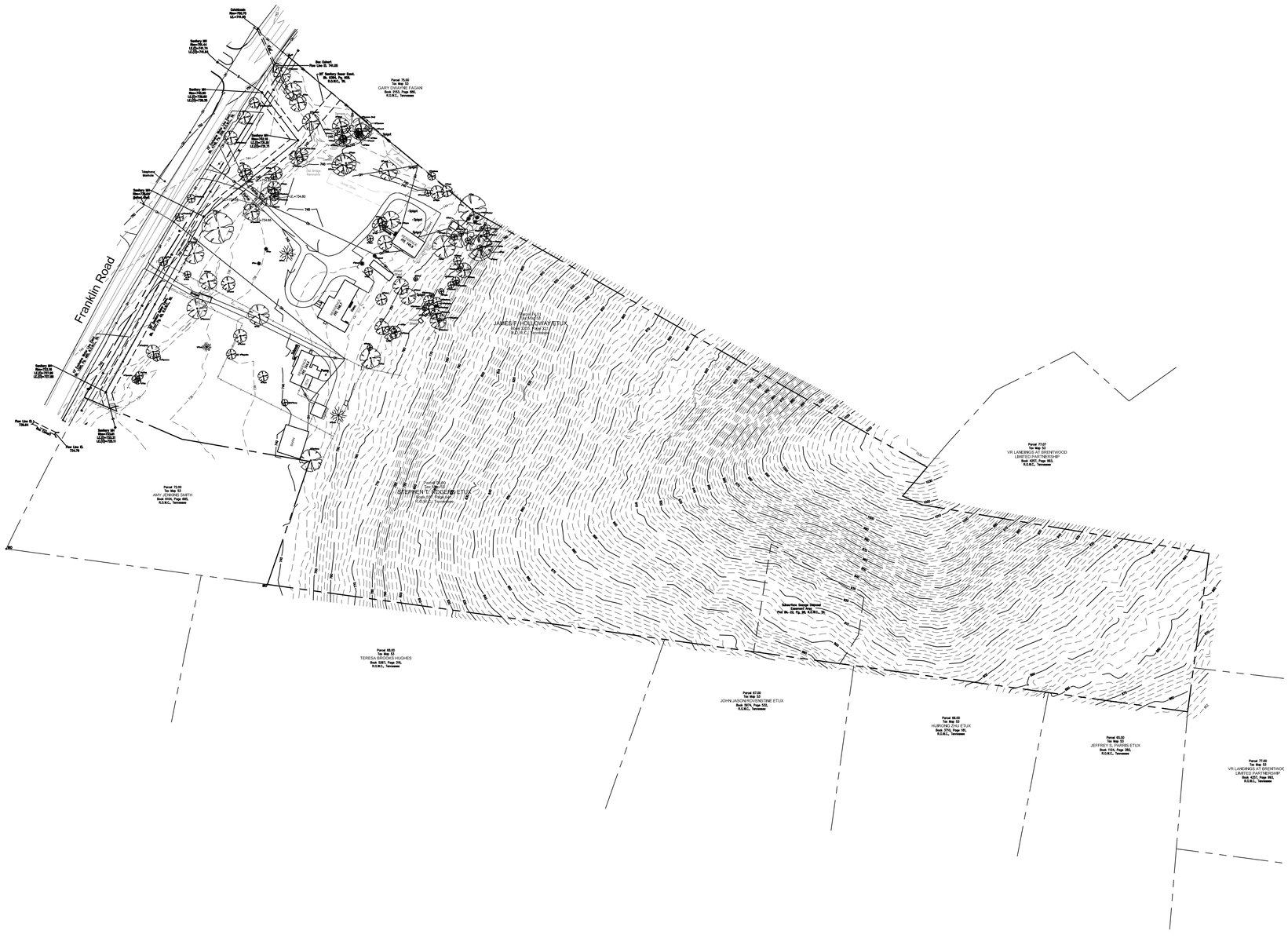
- PLAN DATE: March 7, 2016
- PLAN REVISION DATE: April 7, 2016

A NONE
B NONE
C NONE
D NONE

Cover Sheet

C0.0

1. THIS SURVEY IS BASED ON TENNESSEE STATE PLANE COORDINATE SYSTEM ZONE 5301, FIPSZONE 4100, NAD 83 DATUM.



Know what's **below.**
Call before you dig.

NORTH

100 0 50 100 200

GRAPHIC SCALE - 1 inch = 100 ft.

GARY LYNN FAGAN
REGISTERED LANDSCAPE ARCHITECT
STATE OF TENNESSEE
4/7/2016

LAND SOLUTIONS
COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

Being Parcels 73.00 & 74.01 on Tax Map 53
554 FRANKLIN ROAD
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

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- PLAN REVISION DATE: April 7, 2016

A NONE
B NONE
C NONE
D NONE

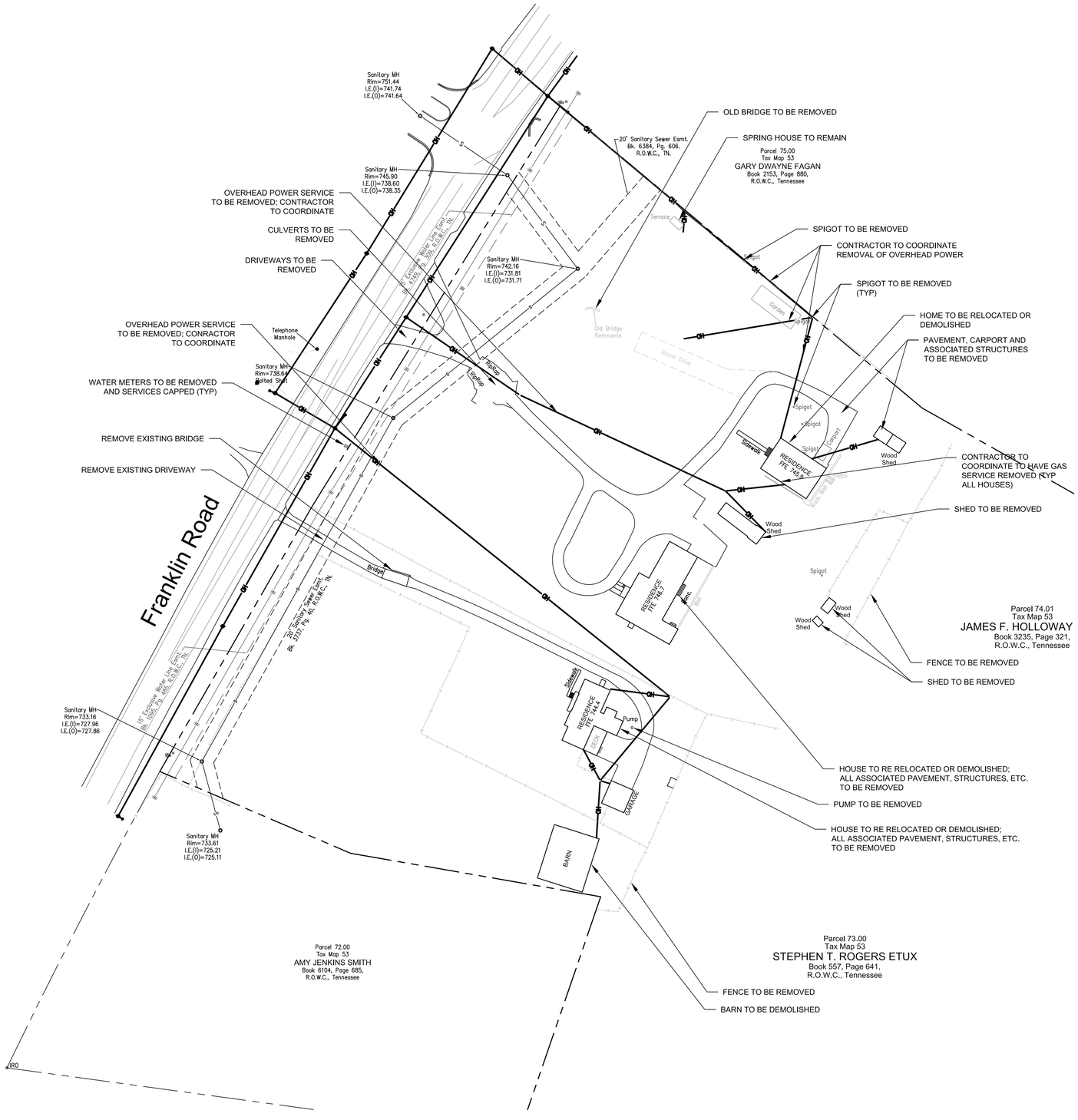
EXISTING CONDITIONS

C1.0

2 of 14

DEMOLITION NOTES

1. THIS SURVEY IS BASED ON TENNESSEE STATE PLANE COORDINATE SYSTEM ZONE 5301, FIPSZONE 4100, NAD 83 DATUM.



Know what's **below.** **Call** before you dig.

NORTH

50 0 25 50 100

GRAPHIC SCALE - 1 inch = 50 ft.

GARY LYNN FAGAN
LICENSED PROFESSIONAL ENGINEER
AGRICULTURE
COMMERCE
1117
STATE OF TENNESSEE
4/7/2016

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

Being Parcels 73.00 & 74.01 on Tax Map 53

554 FRANKLIN ROAD

Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

- PLAN DATE: March 7, 2016
- PLAN REVISION DATE: April 7, 2016

A NONE
B NONE
C NONE
D NONE

DEMOLITION PLAN

C1.1

3 of 14

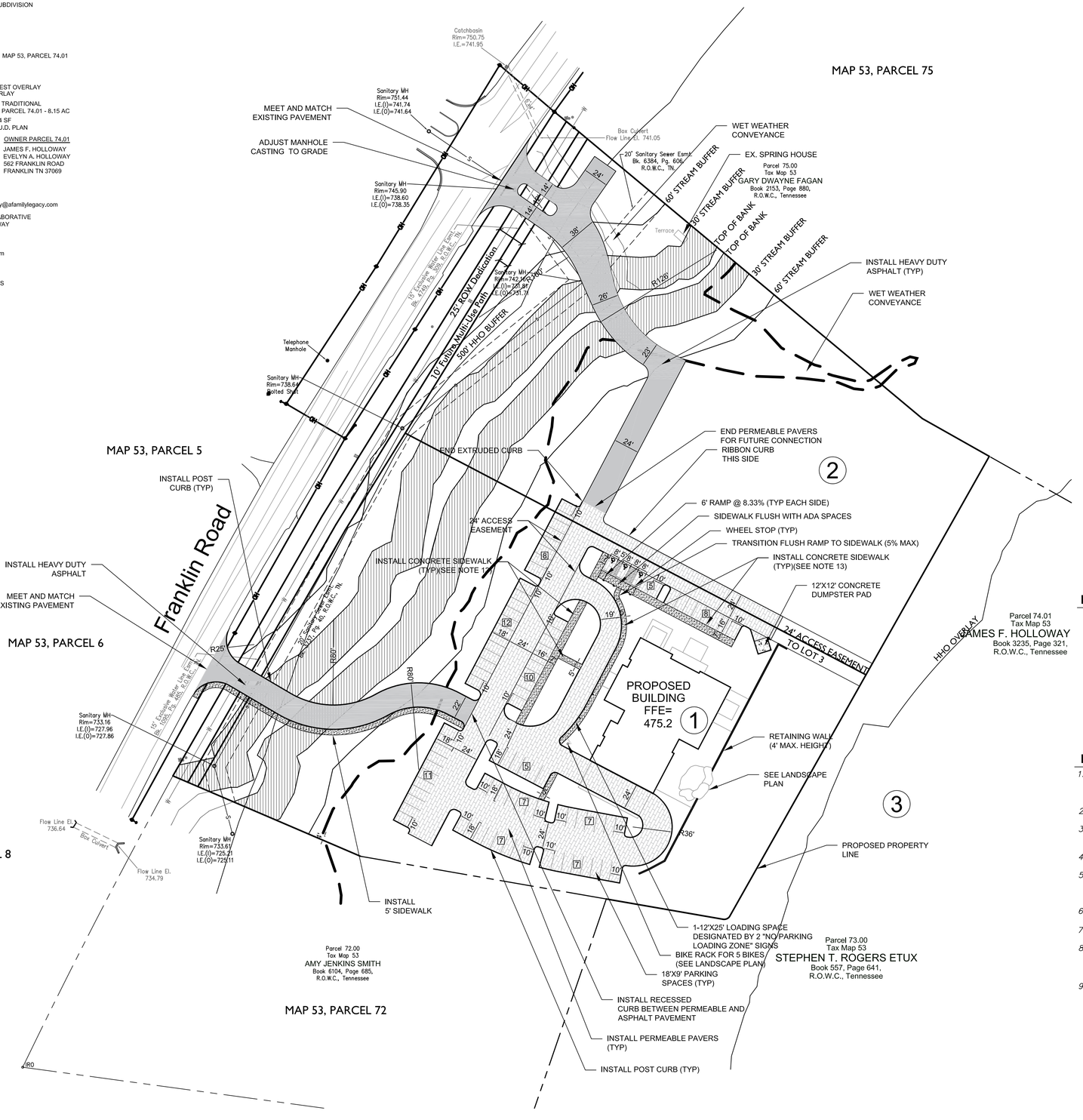
SITE DATA:

PROJECT NAME:	FAMILY LEGACY PUD SUBDIVISION
PROJECT NUMBER:	6072
SUBDIVISION:	FAMILY LEGACY PUD SUBDIVISION
LOT NUMBER:	1
ADDRESS:	554 FRANKLIN ROAD
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 53, PARCEL 73.00 MAP 53, PARCEL 74.01
EXISTING ZONING:	R1
PROPOSED ZONING:	SD-X 0/34.500
CHARACTER AREA OVERLAY:	BERRYS CHAPEL BC-4
OTHER APPLICABLE OVERLAYS	HHO - HILLSIDE/HILLCREST OVERLAY FWO - FLOODWAY OVERLAY
APPLICABLE DEVELOPMENT STANDARD:	TRADITIONAL TRADITIONAL
PARCEL ACREAGE:	PARCEL 73 - 14.57 AC PARCEL 74.01 - 8.15 AC
TOTAL ACREAGE/SQUARE FOOTAGE:	22.72 ACRES OR 989,504 SF
MINIMUM REQUIRED SETBACKS:	AS ESTABLISHED BY P.U.D. PLAN

OWNER PARCEL 73	OWNER PARCEL 74.01
STEPHEN T. ROGERS	JAMES F. HOLLOWAY
ETHEL R. DETCH	EVELYN A. HOLLOWAY
554 FRANKLIN ROAD	562 FRANKLIN ROAD
FRANKLIN TN 37069	FRANKLIN TN 37069

APPLICANT:	WILLIAM GREGORY 7427 CHARLOTTE PIKE NASHVILLE TN, 37209 (615) 390-7724 WGregory@afamilylegacy.com
PLANNER/LANDSCAPE ARCHITECT:	GAMBLE DESIGN COLLABORATIVE
ADDRESS	144 SOUTHEAST PARKWAY SUITE 200 FRANKLIN, TN 37064
OFFICE PHONE	615.975.5765
EMAIL ADDRESS	greggamble209@gmail.com
CONTACT	GREG GAMBLE

LOT 1	
PROPOSED LOT SIZE	165,568 SF or 3.80 ACRES
PROPOSED USE	FUNERAL HOME
BUILDING SQUARE FOOTAGE	10,500 SF
BUILDING HEIGHT	ONE STORY
MINIMUM L.S.R.	0.20
L.S.R. PROVIDED	0.668
INCOMPATIBLE BUFFER REQUIRED	NONE
MINIMUM VEHICLE PARKING REQUIRED BY APPROVED DEV. PLAN	86
MAXIMUM PARKING PERMITTED	108
PARKING PROVIDED	82
BIKE PARKING REQUIRED BY APPROVED DEV. PLAN	5
BIKE PARKING PROVIDED WITH THIS PLAN	5



SITE CONSTRUCTION NOTES

1. THE NECESSARY PERMITS FOR THE WORK SHOWN ON THESE SITE DEVELOPMENT PLANS WILL BE OBTAINED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK ON THIS PROJECT. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES AND OBTAIN ALL PERMITS AND PAY ALL FEES INVOLVED IN SECURING SAID PERMITS. HE SHALL ALSO COMPLY WITH ALL CITY, COUNTY AND STATE BUILDING LAWS, ORDINANCES OR REGULATIONS RELATING TO THE CONSTRUCTION OF PROJECTS SUCH AS THIS ONE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND SHALL BEAR ALL EXPENSES OF FIELD STAKING NECESSARY FOR SITE AND BUILDING LAYOUT. ALL LAYOUT SHALL BE PERFORMED IN ACCORDANCE WITH DETAIL PLANS AS OUTLINED IN THE SITE LAYOUT PLAN.
3. THE LOCATION OF EXISTING PIPING AND UNDERGROUND UTILITIES, SUCH AS WATER AND GAS LINES, ELECTRICAL AND TELEPHONE CONDUITS, ETC., AS SHOWN ON THIS PORTION OF THE PLANS HAVE BEEN DETERMINED FROM THE BEST AVAILABLE INFORMATION BY ACTUAL SURVEYS, OR TAKEN FROM THE RECORDS AND DRAWINGS OF THE EXISTING UTILITIES. HOWEVER, THE CIVIL ENGINEER DOES NOT ASSUME RESPONSIBILITY THAT, DURING CONSTRUCTION, THE POSSIBILITY OF UTILITIES OTHER THAN THOSE SHOWN MAY BE ENCOUNTERED OR THAT ACTUAL LOCATION OF THOSE SHOWN MAY VARY SOMEWHAT FROM THE LOCATION DESIGNATED ON THIS PORTION OF THE PLANS. IN AREAS WHERE IT IS NECESSARY THAT THE EXACT LOCATIONS OF UNDERGROUND LINES BE KNOWN, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, FURNISH ALL LABOR AND TOOLS TO EITHER VERIFY AND SUBSTANTIATE OR DEFINITELY ESTABLISH THE LOCATION OF THE LINES.
4. THE CONTRACTOR MUST UNDERSTAND THAT THE WORK IS ENTIRELY AT HIS RISK UNTIL SAME IS ACCEPTED AND HE WILL BE HELD RESPONSIBLE FOR ITS SAFETY BY THE OWNER. THEREFORE, THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY TEMPORARY WORKS FOR THE PROTECTION OF THE WORK, INCLUDING BARRICADES, WARNING SIGNS, AND LIGHTS.
5. IF, DURING THE CONSTRUCTION OF THE SITE DEVELOPMENT PORTION OF THIS PROJECT, A QUESTION OF INTENT OR CLARITY ARISES FROM EITHER THE PLANS OR SPECIFICATIONS, THE CONTRACTOR WILL IMMEDIATELY BRING THE MATTER TO THE ATTENTION OF THE CIVIL ENGINEER FOR RESOLUTION BEFORE THE AFFECTED WORK ITEMS ARE INITIATED OR PURSUED FURTHER.
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9. THE STOCKPILING OR STORAGE OF TREES, VEGETATION AND OTHER DELETERIOUS MATTER OR MATERIALS DEEMED "UNSUITABLE" BY THE SOILS AND CIVIL ENGINEERS SHALL NOT BE ALLOWED ON SITE. SAID MATERIALS SHALL BE PROPERLY DISPOSED OF OFF THE PROPERTIES, THE COST AND RESPONSIBILITY OF WHICH SHALL BE THE CONTRACTOR'S. SITE FOR THE DISPOSAL OF SAID MATERIALS SHALL FIRST BE APPROVED BY THE CIVIL ENGINEER.
10. THE PLACING AND SPREADING OF ANY FILL MATERIAL IS TO BE STARTED AT THE LOWEST POINT AND BROUGHT UP IN HORIZONTAL LAYERS OF 8-INCH THICKNESS. SAID FILL MATERIAL IS TO BE FREE OF SOD, ROOTS, FROZEN SOILS, OR ANY OTHER DECOMPOSABLE MATERIAL. THE RELATIVE COMPACTION OF EACH LAYER SHALL NOT BE LESS THAN 95 % OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698) IN ALL AREAS OF FILL, AND COMPACTION OF 98% OF SAME SPECIFICATION FOR MATERIALS USED IN THE UPPER 24 INCHES BENEATH PAVEMENT AND GRADE SLABS.
11. ALL STORM DRAINAGE STRUCTURES SHALL BE PRECAST CONCRETE WITH STEEL REINFORCEMENT PER T.D.O.T. STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED. ALL STORM DRAINAGE CASTINGS TO BE JOHN BOUCHARD & SONS OR APPROVED EQUAL.
12. ALL RADII AT INTERNAL ISLANDS ARE 3'. OTHER RADII ARE 5' UNLESS NOTED.
13. CONCRETE WALKS WHERE CURB IS INDICATED ARE TO BE TURNDOWN SIDEWALKS. CONCRETE WALKS ADJACENT TO GRASS DO NOT REQUIRE TURNDOWN.
14. ALL PERMEABLE PAVERS TO BE PLACED IN A WATER QUALITY/DETENTION EASEMENT ON FINAL PLAT.

PAVEMENT LEGEND:

- CONCRETE PAVEMENT
- HEAVY DUTY ASPHALT PAVEMENT
- CONCRETE SIDEWALK
- PERMEABLE PAVEMENT

PROJECT GENERAL NOTES:

1. *THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES IN THE PROXIMITY OF THE CONSTRUCTION AREA AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE AND PROJECT CONSULTANTS PRIOR TO BEGINNING WORK.*
2. *THE CONTRACTOR SHALL CONFORM TO ALL LOCAL, STATE AND FEDERAL CODES AND OBTAIN ALL PERMITS PRIOR TO BEGINNING WORK.*
3. *THE CONTRACTOR SHALL CHECK ALL FINISHED GRADES AND DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE AND PROJECT CONSULTANTS PRIOR TO BEGINNING WORK.*
4. *DIMENSIONS ARE TO THE FACE OF CURB, EDGE OF CONCRETE AND FACE OF BUILDING, UNLESS NOTED OTHERWISE.*
5. *PROPOSED BUILDING FOOTPRINT IS FOR GRAPHIC PURPOSES ONLY. CONTRACTOR SHALL USE THE CURRENT ARCHITECTURAL DRAWINGS FOR BUILDING LOCATION AND VERIFY THAT THERE ARE NO DISCREPANCIES WITH THESE PLANS.*
6. *ALL TRAFFIC MARKINGS SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICE (MUTCD).*
7. *ALL HANDICAP RAMPS, PARKING SPACES AND ACCESSIBLE ROUTES SHALL COMPLY WITH THE CURRENT ADA REQUIREMENTS.*
8. *EXTERIOR DOOR LANDINGS SHALL BE PROVIDED PER THE STATE AND LOCAL BUILDING CODE. CONTRACTOR SHALL COORDINATE DOOR LOCATIONS AND ADJACENT SIDEWALK/LANDING GRADES WITH THESE PLANS AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE AND PROJECT CONSULTANTS.*
9. *THE SURVEY IS BASED ON TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FIPSZONE 4100, NAD 83 DATUM.*

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NORTH

50 0 25 50 100

GRAPHIC SCALE - 1 inch = 50 ft.

GARY LYNN EADY — REGISTERED LANDSCAPE ARCHITECT — STATE OF TENNESSEE

4/7/2016

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

Being Parcels 73.00 & 74.01 on Tax Map 53
554 FRANKLIN ROAD
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

- PLAN DATE: March 7, 2016
- PLAN REVISION DATE: April 7, 2016

A NONE
B NONE
C NONE
D NONE

SITE PLAN

C2.0

4 of 14

PIPE AND STRUCTURE CHARTS

ID	STR TYPE	TC	I.E. IN	I.E. OUT	LENGTH	PIPE SIZE	TYPE	SLOPE
1	OUTLET			739.73				
1-2					173	8"	HDPE N-12	0.5
2	NYLOPLAST	744.3	740.70	740.60				
2-3					69	8"	HDPE N-12	0.5
3	NYLOPLAST	744.0	741.15	741.05				
3-4					87	8"	HDPE N-12	0.5
4	NYLOPLAST	744.0	741.69	741.59				
4-5					23	8"	HDPE N-12	0.5
5	NYLOPLAST	743.8		741.8				
13	HW			739.96				
13-14					83	6'X4'	RCBC	1.25
14	JUNCTION	749.4		741.0				
15A	SINGLE	740.5						
15	HW			731.7				
15-16					32	16'x7'	AQUA ARCH	0.9
16	HW			732.0				
16A	SINGLE	740.5						
17	SINGLE	745.0						
17	HW			735.9				
17-18					32	16'x7'	AQUA ARCH	0.6
18	HW			735.7				
18A	SINGLE	745.0						

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SIGNATURE — DATE: 4/7/2016

CIRCLE ONE: DEVELOPER (PROJECT ENGINEER) OTHER _____

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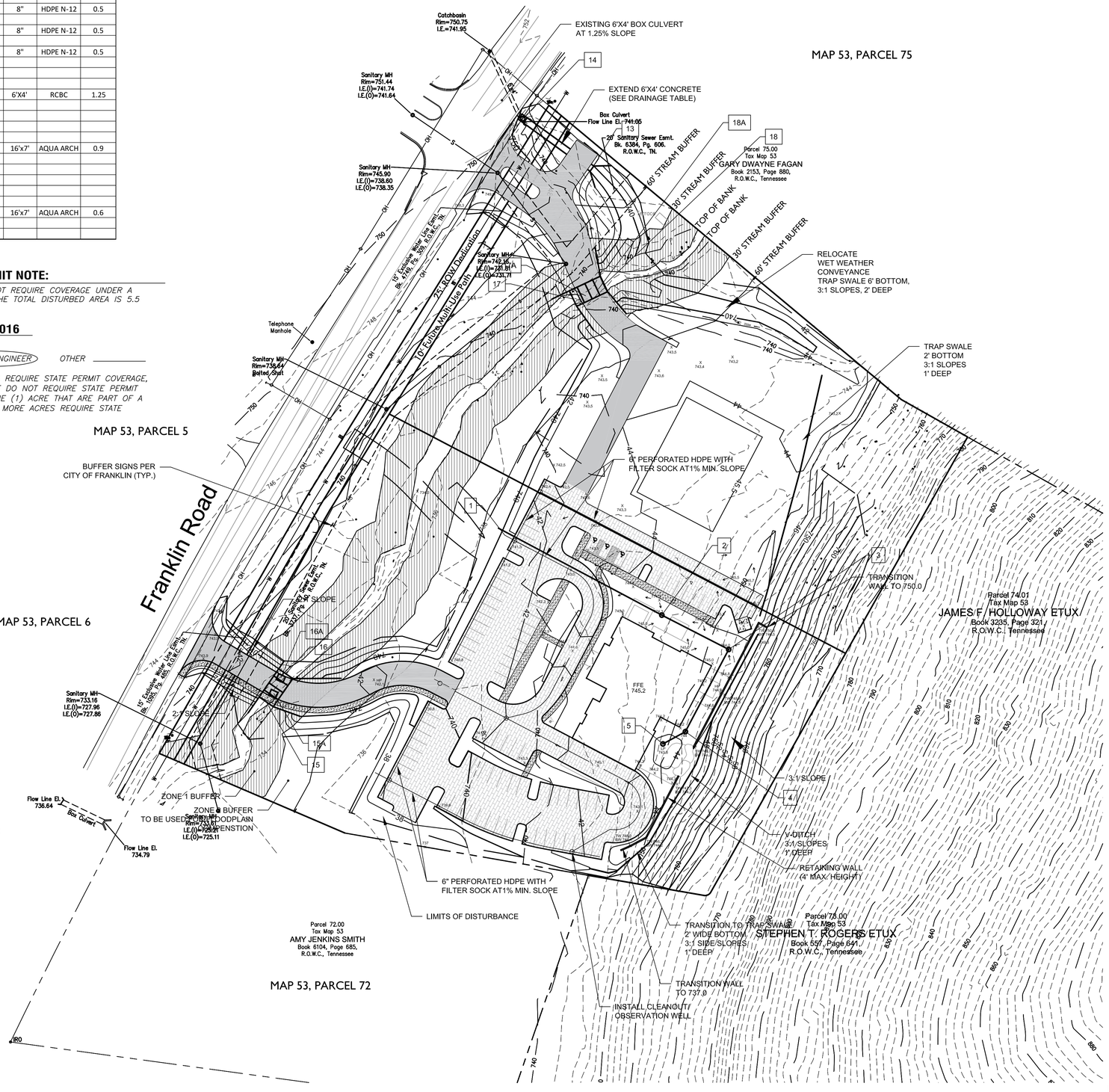

GRADING AND DRAINAGE NOTES:

1. Grading Permit is required for any project disturbing more than 10,000 sf, adding more than 5,000 sf of impervious surface or for any site grading requiring stockpiling of material.
2. The Developer shall provide the necessary labor and supervision required to support field testing by the independent testing firm and inspections by City officials at no cost to the City. Test reports of field testing if applicable shall be submitted directly to the Street Department. Defects disclosed by tests shall be rectified.
3. An authorized representative of the City shall make a final inspection of the project after completion to determine acceptability of the work and for release of performance bonds if required. Before this final inspection can be made, the Engineer responsible for the project shall certify in writing to the City Engineer that the work has been completed in accordance with approved plans and specifications.
4. Drainage facilities including, but not limited to, culverts, detention basins and ditches, as well as the roadway sub-grade, base stone and binder & surface coarse shall be inspected, tested and given approval at each stage of installation prior to proceeding to the next stage of construction. Final construction inspection for approval and acceptance of streets and drainage systems will not be granted until all work has been completed in accordance with the approved plans.
5. Locating and coordination for the relocation of existing utilities is the responsibility of the contractor. Tennessee's One-Call and the City of Franklin utility location service shall be utilized in addition to coordination with local utility owners. The contractor shall at all times protect existing utilities and will be responsible for costs due to damage caused to any utility lines.
6. ALL SEDIMENT AND EROSION CONTROL MEASURES, SUCH AS SILT PONDS OR INLET SEDIMENT BARRIERS SHALL CONFORM TO THE STORM WATER PERMITTING REQUIREMENTS OF THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION AND THE "TENNESSEE EROSION AND SEDIMENT CONTROL HANDBOOK" AS A MINIMUM.
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18. THIS SURVEY IS BASED ON TENNESSEE STATE PLANE COORDINATE SYSTEM ZONE 5301, FIPSZONE 4100, NAD 83 DATUM.
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NORTH

50 0 25 50 100

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GARY LYNN FAGAN — REGISTERED ENGINEER — AGRICULTURE — COMMERCE — 111121 — STATE OF TENNESSEE

4/7/2016

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

Being Parcels 73.00 & 74.01 on Tax Map 53

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Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

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A NONE
B NONE
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D NONE

GRADING & DRAINAGE PLAN

C3.0

5 of 14

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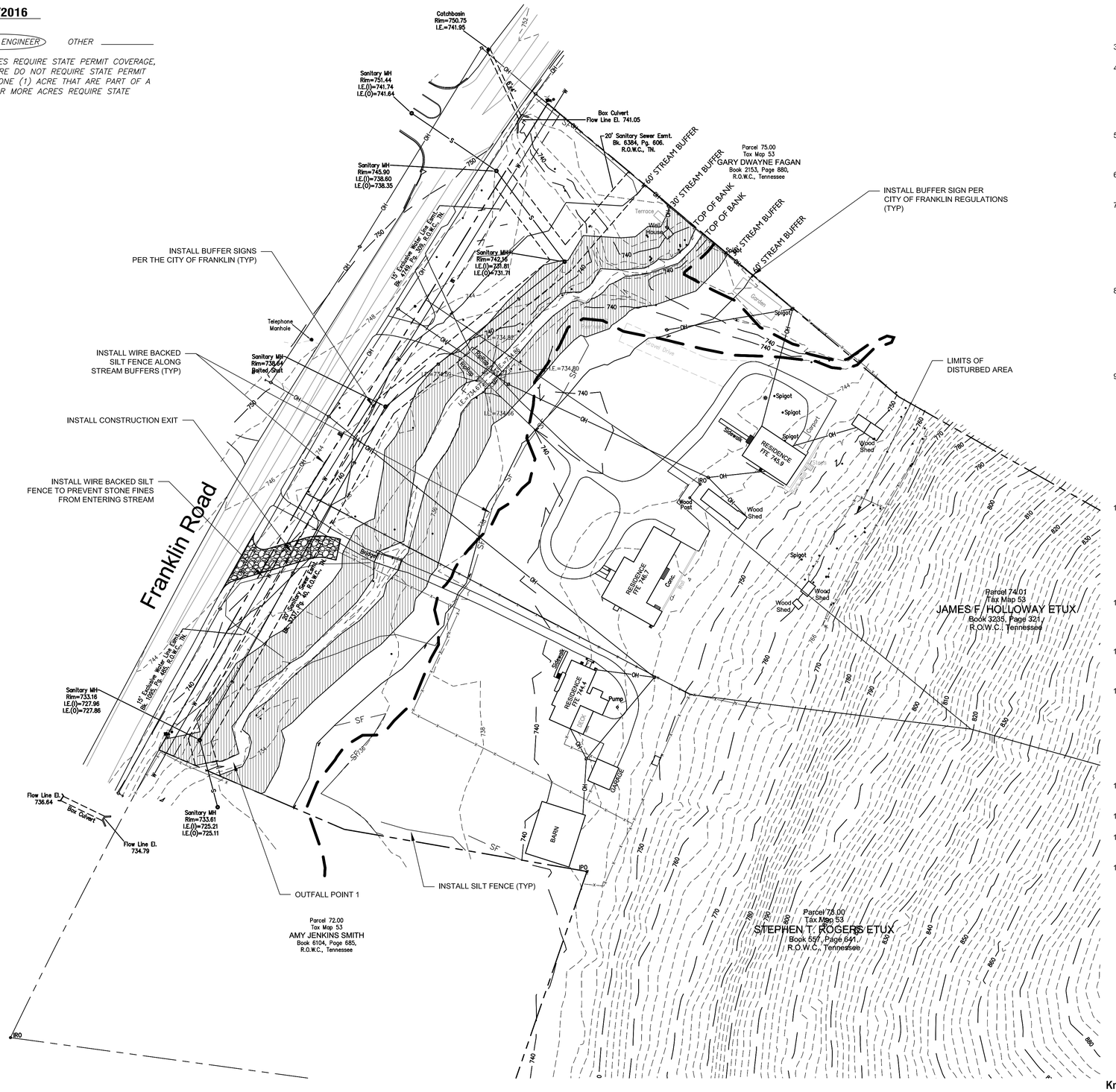

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14. WATER QUALITY BMPs SHALL NOTE BE INSTALLED UNTIL BUILD OUT IS NEAR COMPLETION TO PREVENT CONSTRUCTION SEDIMENT FROM ENTERING BMPs.
15. WATER QUALITY AREAS SHALL NOT BE USED AS SEDIMENT BASINS DURING CONSTRUCTION.
16. INSTALLERS OF WATER QUALITY BMPs SHOULD FOLLOW ALL INSTALLATION GUIDELINES SET FORTH IN THE CITY OF FRANKLIN BMP MANUAL LOCATED ON THE CITY'S WEBSITE.
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LICENSED PROFESSIONAL ENGINEER
AGRICULTURE
COMMERCE
1117
STATE OF TENNESSEE
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INITIAL
EROSION
CONTROL PLAN

C3.1

6 of 14

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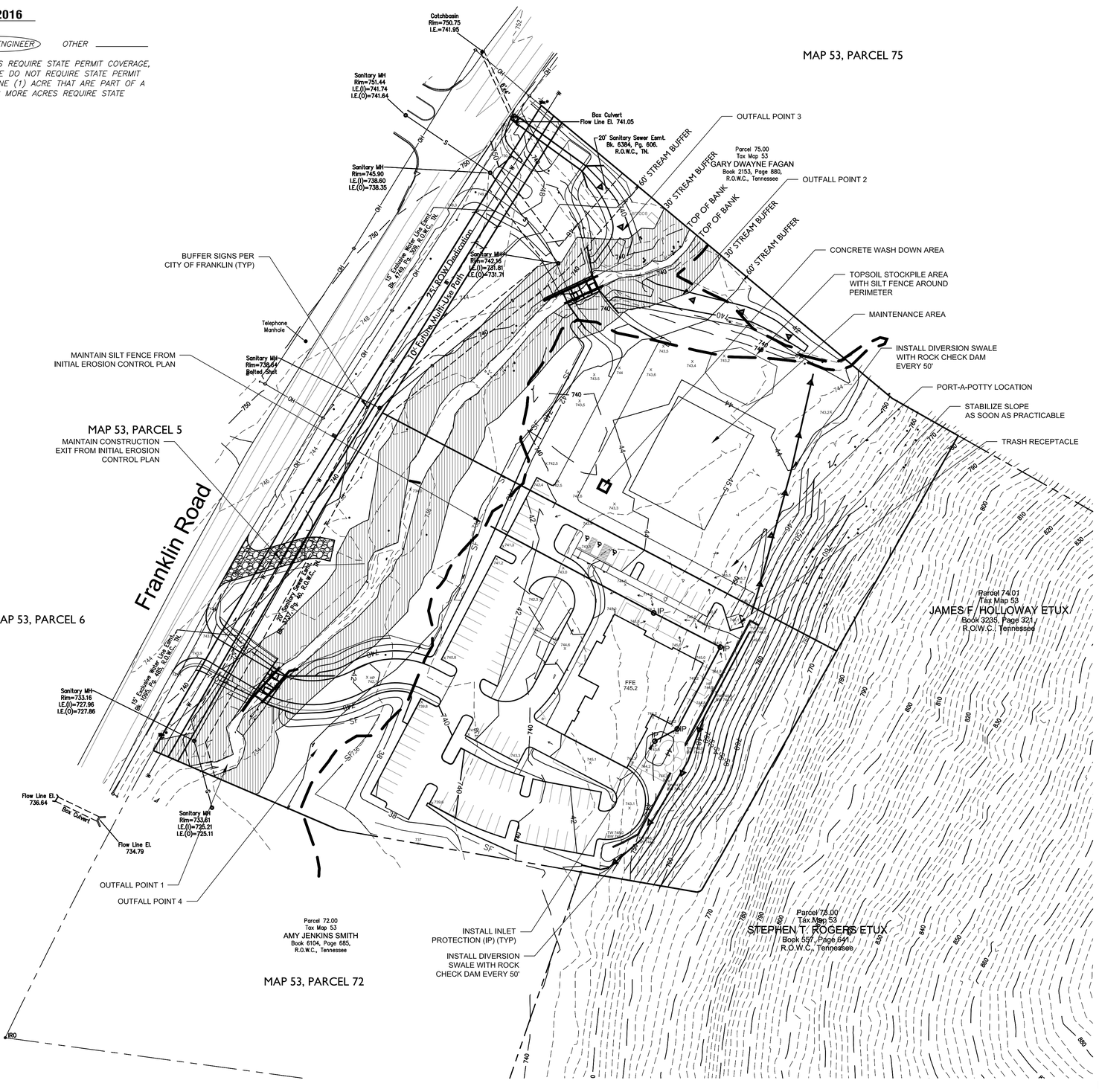

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13. BUFFER ZONES AND TREES SPECIFIED FOR PRESERVATION SHOULD BE CLEARLY INDICATED ON THE GRADING AND DEMOLITION PLANS. BUFFER ZONES AND TREES SPECIFIED FOR PRESERVATION MUST BE PROTECTED THROUGH THE USE OF TREE PROTECTION BARRIERS TO THE DRIP LINE OF SAID TREES. THESE BARRIERS SHOULD CONSIST OF ORANGE GRID FABRIC STAKED AT THE BORDER AND/OR DRIP LINE OF PRESERVED BUFFER ZONE AND/OR TREES TO RESTRICT CONSTRUCTION ACTIVITY AND ACCESS WITHIN THE PROTECTED AREAS AND/OR TREE'S DRIP LINE. A TREE PROTECTION DETAIL MUST ALSO BE PROVIDED.
14. WATER QUALITY BMPs SHALL NOTE BE INSTALLED UNTIL BUILD OUT IS NEAR COMPLETION TO PREVENT CONSTRUCTION SEDIMENT FROM ENTERING BMPs.
15. WATER QUALITY AREAS SHALL NOT BE USED AS SEDIMENT BASINS DURING CONSTRUCTION.
16. INSTALLERS OF WATER QUALITY BMPs SHOULD FOLLOW ALL INSTALLATION GUIDELINES SET FORTH IN THE CITY OF FRANKLIN BMP MANUAL LOCATED ON THE CITY'S WEBSITE.
17. THERE SHALL BE NO MOWING, CLEARING, GRADING, CONSTRUCTION, STORAGE OR DISTURBANCE OF VEGETATION IN RIPARIAN BUFFERS EXCEPT AS PERMITTED BY THE CITY ENGINEER, OR HIS DESIGNEE.

Know what's **below.**
Call before you dig.

GRAPHIC SCALE - 1 inch = 50 ft.

GARY LYNN FAGAN
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
TECHNOLOGY
STATE OF TENNESSEE
4/7/2016

LAND SOLUTIONS
COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

Being Parcels 73.00 & 74.01 on Tax Map 53

554 FRANKLIN ROAD

Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

- PLAN DATE: March 7, 2016
- PLAN REVISION DATE: April 7, 2016

A NONE
B NONE
C NONE
D NONE

INTERMEDIATE EROSION CONTROL PLAN

C3.2

7 of 14

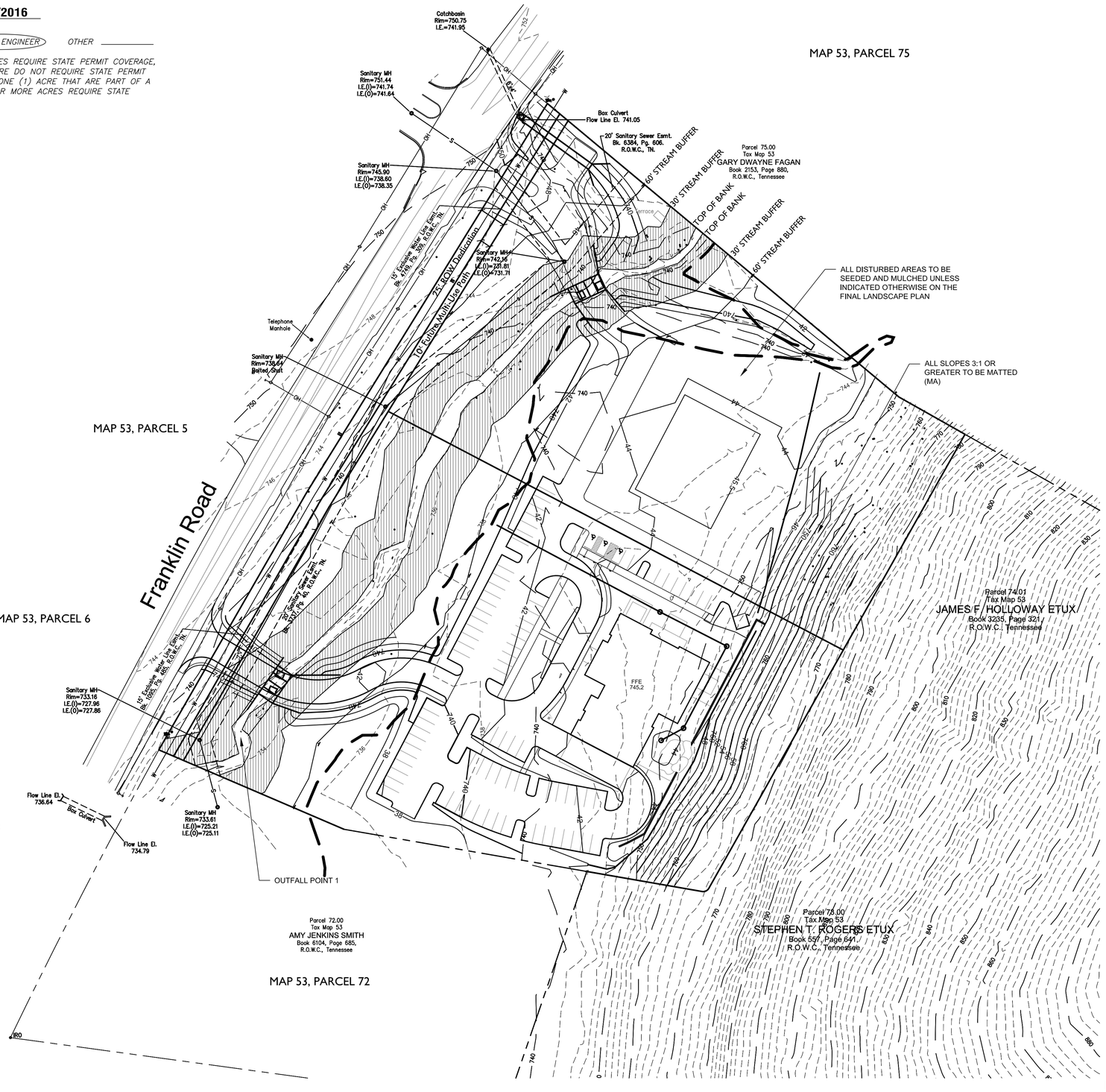
TN CONSTRUCTION GENERAL PERMIT NOTE:

I HEREBY CERTIFY THAT THIS PROJECT DOES REQUIRE COVERAGE UNDER A TENNESSEE CONSTRUCTION GENERAL PERMIT. THE TOTAL DISTURBED AREA IS 5.5 ACRES.

SIGNATURE — DATE: 4/7/2016

CIRCLE ONE: DEVELOPER (PROJECT ENGINEER) OTHER _____

NOTE: PROJECTS OF ONE (1) OR MORE ACRES REQUIRE STATE PERMIT COVERAGE, WHILE PROJECTS OF LESS THAN ONE (1) ACRE DO NOT REQUIRE STATE PERMIT COVERAGE. ALSO, PROJECTS OF LESS THAN ONE (1) ACRE THAT ARE PART OF A TOTAL DEVELOPMENT PROJECT OF ONE (1) OR MORE ACRES REQUIRE STATE PERMIT COVERAGE.



EROSION AND SEDIMENT CONTROL NOTES:

1. THIS SURVEY IS BASED ON TENNESSEE STATE PLANE COORDINATE SYSTEM ZONE 5301, FIPSZONE 4100, NAD 83 DATUM.
2. ALL SEDIMENT AND EROSION CONTROL MEASURES, SUCH AS SILT PONDS OR INLET SEDIMENT BARRIERS SHALL CONFORM TO THE STORM WATER PERMITTING REQUIREMENTS OF THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION AND THE "TENNESSEE EROSION AND SEDIMENT CONTROL HANDBOOK" AS A MINIMUM.
3. EROSION CONTROL TO BE INSPECTED AND APPROVED PRIOR TO ALL OTHER WORK BEING STARTED.
4. THE TIME OF EXPOSURE UNPROTECTED SOILS SHALL BE KEPT TO A MAXIMUM OF 20 DAYS. REFER TO THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION, EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION; SECTION TS FOR AREAS TO BE STABILIZED THAT DO NOT REQUIRE PERMANENT STABILIZATION SUCH AS BUILDING FOOTPRINTS, PARKING LOTS, ETC.
5. KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE REFER TO THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION, EROSION AND SEDIMENT CONTROL HANDBOOK, SECTION PAM.
6. NO OTHER WORK WILL BE INITIATED ON THE PROJECT UNTIL THE EROSION. SEDIMENT CONTROL MEASURES SHOWN ON THE PLANS AND DETAILS ARE PROPERTY IN PLACE.
7. STRAW BALES SHOWN THUS (INSERT APPROPRIATE LINE TYPE) ARE TO BE USED AS TEMPORARY SEDIMENT BARRIERS. STRAW BALES ARE TO BE FIRM AND SECURELY TIED WITH PLASTIC OR WIRE BINDING. BALES ARE TO BE PLACED RANCHING AND FIRMLY ANCHORED TO THE GROUND WITH STEEL DRIFT PINS OR WOODEN STAKES AS SHOWN IN DETAIL. SILT FENCE SHALL BE INSTALLED AS PER SECTION SF OF THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION, EROSION AND SEDIMENT CONTROL HANDBOOK; LATEST EDITION.
8. IF, AT ANY TIME DURING THE CONSTRUCTION PHASE OF THIS PROJECT, THE EROSION/SEDIMENTCONTROL MEASURED INSTALLED FAIL TO FUNCTION PROPERLY, NEED MAINTENANCE OR REPAIR, OR NEED NEW REPLACEMENT IN KIND, THE CONTRACTOR WILL EFFECT SUCH ACTION AS ARE NEEDED TO CORRECT THE SITUATION AT NOT ADDITIONAL COST TO THE OWNER. ALL MEASURES ARE TO BE INSPECTED AFTER EACH RAIN EVENT. ANY MEASURES NEEDING REPLACEMENT WILL BE CORRECTED WITHIN 5 DAYS OF THE RAIN EVENT.
9. DISTURBED AREAS ARE TO BE GRADED TO DRAIN AS INDICATED ON GRADING PLAN TO SEDIMENT BARRIERS DURING AND UPON COMPLETION OF CONSTRUCTION. ALL STRIPPED OR CUT/FILL AREAS REQUIRING PERMANENT VEGETATION ARE TO HAVE A MINIMUM OF 6-INCH DEPTH TOPSOIL COVER. AREAS DRESSED WITH TOPSOIL WILL RECEIVE 12 POUNDS PER 1,000 SQUARE FEET OF 6-12-12 FERTILIZER, REFER TO SECTION PS OF THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION, EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION TO DETERMINE SEED TYPE AND SEEDING DATES ALONG WITH SEEDBED PREPARATION AND PLANT SELECTION AND STRAW MULCH OF 75% COVERAGE (APPROXIMATELY 125 POUNDS PER 1,000 SQUARE FEET) EXCEPT AS OTHERWISE SHOWN ON PLAN. AREAS SHALL BE WATERED TO NOT CAUSE RUNOFF.
10. ALL STOCKPILED SOIL SHOULD BE STABILIZED USING TEMPORARY VEGETATION. REFER TO THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION, EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION, SECTION TS. UPON STABILIZATION OF THE SITE WITH A GOOD (ACCEPTABLE) STAND OF GRASS AND/OR GROUNDCOVER, THE EROSION/SEDIMENT CONTROL INSTALLATIONS WILL BE REMOVED AND THE AREA DISTURBED WILL BE SEEDED AND MULCHED WITH THE SAME TREATMENT AS OTHER NEW GRASSED AREAS OF THE PROJECT.
11. A STONE ACCESS RAMP IS TO BE CONSTRUCTED AT THE SITE ENTRANCE WITH A MINIMUM WIDTH OF 20 FEET AND MINIMUM LENGTH OF 100 FEET. THE RAMP IS TO BE BASED WITH 8 INCHES OF ASTM D 448, SIZE NO. 1 STONE, AND MAINTAINED THROUGHOUT CONSTRUCTION.
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Know what's **below.** **Call** before you dig.

GRAPHIC SCALE - 1 inch = 50 ft. (50 0 25 50 100)

GARY LYNN FAGAN — LICENSED PROFESSIONAL ENGINEER — STATE OF TENNESSEE — 4/7/2016

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

Being Parcels 73.00 & 74.01 on Tax Map 53
554 FRANKLIN ROAD
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:
- PLAN DATE: March 7, 2016
- PLAN REVISION DATE: April 7, 2016

A NONE
B NONE
C NONE
D NONE

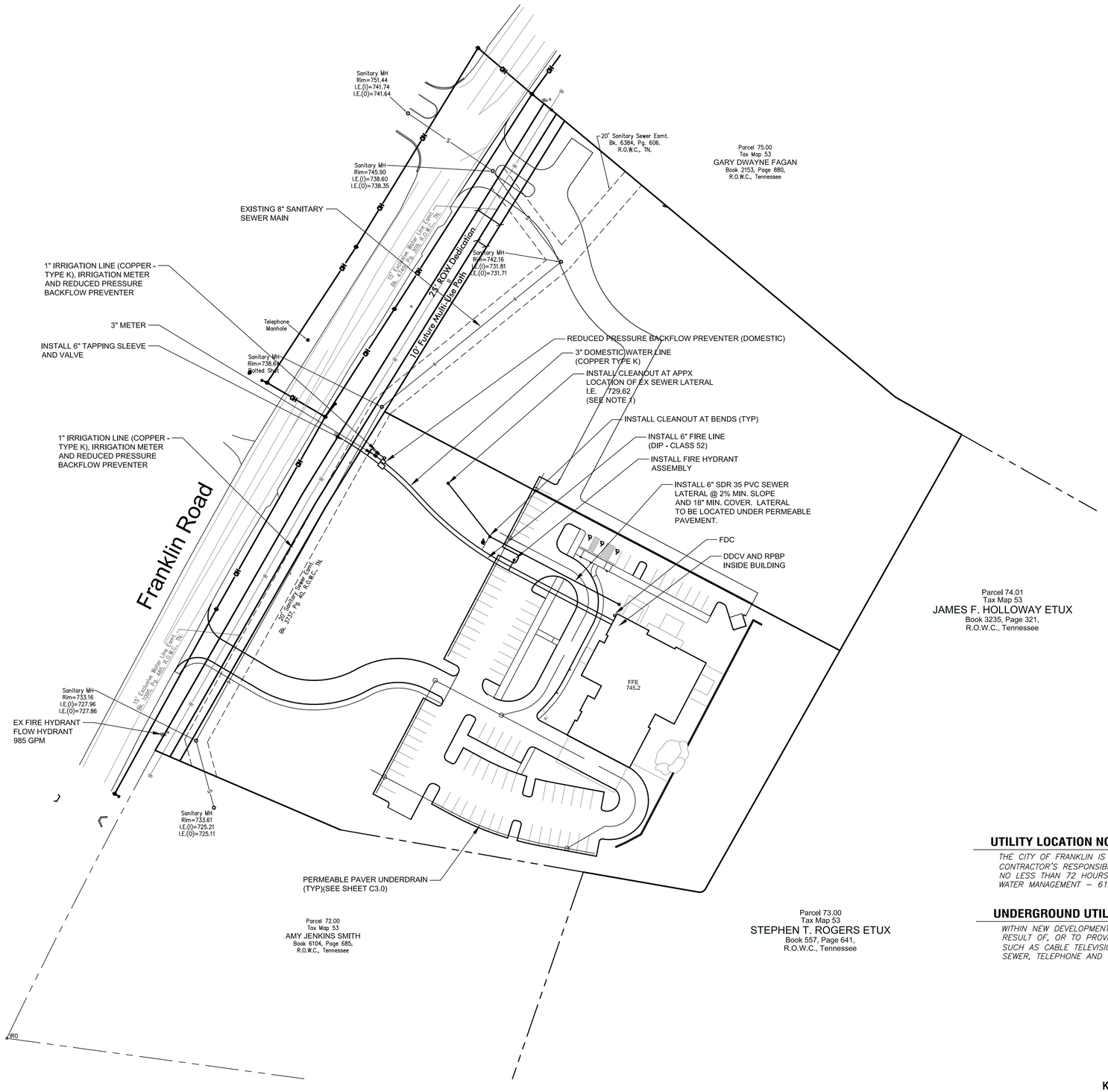
FINAL EROSION CONTROL PLAN

C3.3

8 of 14

UTILITY NOTES:

1. LOCATION OF EXISTING SEWER SERVICE, SIZE AND INVERT ELEVATION TO BE DETERMINED BY CONTRACTOR. NOTIFY ENGINEER PRIOR TO INSTALLATION OF NEW SERVICE TO BUILDING.
2. ALL SEWER WORK TO BE IN ACCORDANCE WITH THE CITY OF FRANKLIN SPECIFICATIONS.
3. ALL WATER LINE WORK TO BE IN ACCORDANCE WITH MALLORY VALLEY UTILITY DISTRICT SPECIFICATIONS.
4. THIS SURVEY IS BASED ON TENNESSEE STATE PLANE COORDINATE SYSTEM ZONE 5301, FIPSZONE 4100, NAD 83 DATUM.
5. CITY OF FRANKLIN WATER MANAGEMENT CONTACT:
   124 LUMBER DRIVE
   FRANKLIN, TN 37064
   ATTN: UTILITY INSPECTOR
   615-794-4554



UTILITY LOCATION NOTE:

THE CITY OF FRANKLIN IS NOT A MEMBER OF TN ONE CALL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT FRANKLIN WATER MANAGEMENT NO LESS THAN 72 HOURS PRIOR TO COMMENCING WORK. WATER MANAGEMENT – 615–794–4554

UNDERGROUND UTILITY NOTE:

WITHIN NEW DEVELOPMENTS AND FOR OFF–SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS, GAS, SEWER, TELEPHONE AND WATER LINES SHALL BE PLACED UNDERGROUND.

811 Know what's **below.** **Call** before you dig.

NORTH

50 0 25 50 100

GRAPHIC SCALE - 1 inch = 50 ft.

GARY LYNN EARLY
REGISTERED LANDSCAPE ARCHITECT
STATE OF TENNESSEE
4/7/2016

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

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Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

- PLAN DATE: March 7, 2016
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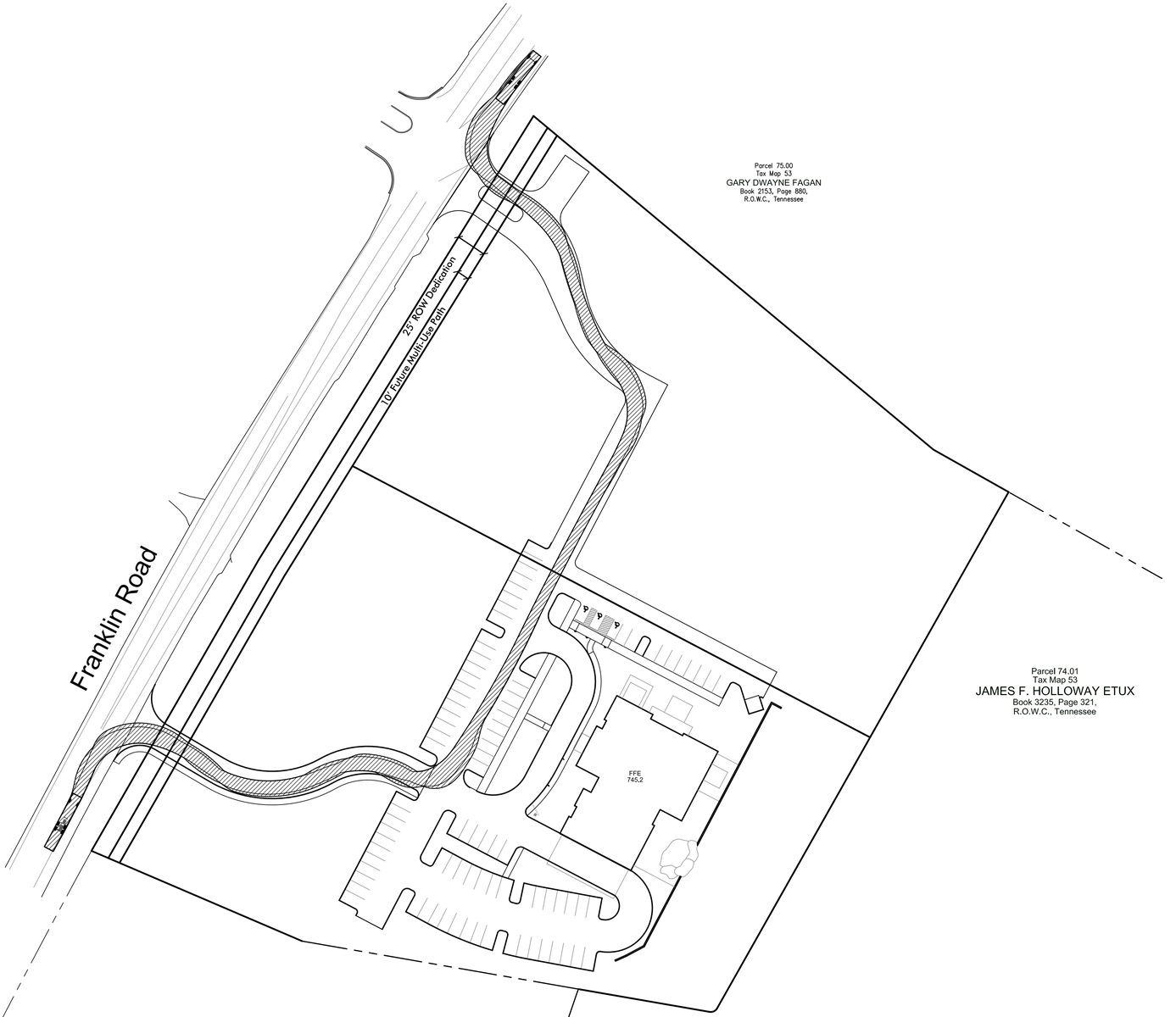
A NONE
B NONE
C NONE
D NONE

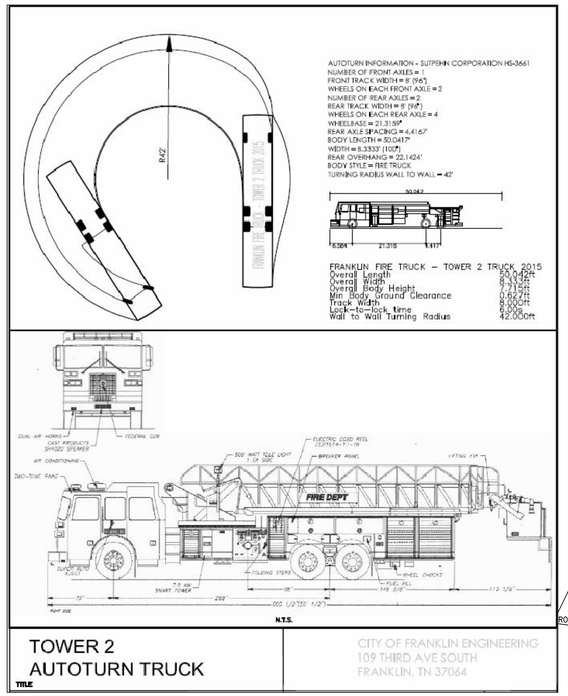
UTILITY PLAN

C4.0

9 of 14

1. THIS SURVEY IS BASED ON TENNESSEE STATE PLANE COORDINATE SYSTEM ZONE 5301, FIPSZONE 4100, NAD 83 DATUM.





TOWER 2
AUTOTURN TRUCK

TITLE

CITY OF FRANKLIN ENGINEERING
109 THIRD AVE SOUTH
FRANKLIN, TN 37064

Know what's **below.**
Call before you dig.

50 0 25 50 100
GRAPHIC SCALE - 1 inch = 50 ft.

STATE OF TENNESSEE
GARY LYNN FAGAN
REGISTERED LANDSCAPE ARCHITECT
AGRICULTURE
COMMERCE
1117
4/7/2016

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

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Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

- PLAN DATE: March 7, 2016
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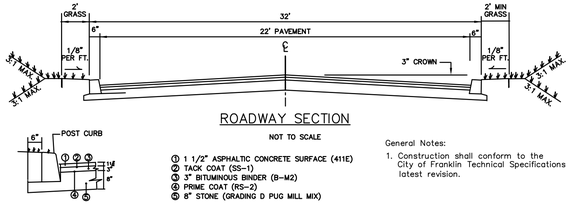
A NONE
B NONE
C NONE
D NONE

AUTOTURN PLAN

C5.0

10 of 14



ROADWAY SECTION

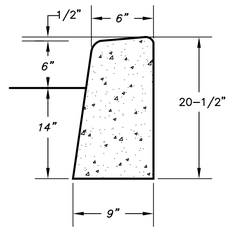
NOT TO SCALE

PAVEMENT COURSES

General Notes:
1. Construction shall conform to the City of Franklin Technical Specifications latest revision.

TYPICAL ROADWAY AND PAVEMENT SECTION

NOT TO SCALE

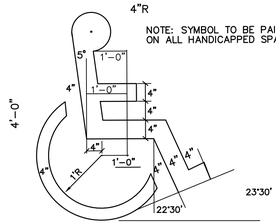


GENERAL NOTES

1. EXPANSION JOINTS TO BE SPACED A MAXIMUM OF 100 FEET APART OR AS DIRECTED BY THE ENGINEER.
2. EXPANSION JOINTS WILL ALSO BE REQUIRED AT TANGENT POINTS, RAMPS, AND INLETS.
3. CONTRACTION JOINTS ARE TO BE CUT INTO CURB AND GUTTER EVERY 10 FEET TO A DEPTH OF D/4, WHERE D EQUALS THE THICKNESS OF THE SECTION. THE SPACING OF 10 FEET MAY BE REDUCED AT CLOSURES BUT NO SECTION OF CURB SHALL BE LESS THAN 10 FEET.
4. COST OF JOINS TO BE INCLUDED IN THE UNIT BID PRICE FOR CONCRETE CURB.

POST CURB

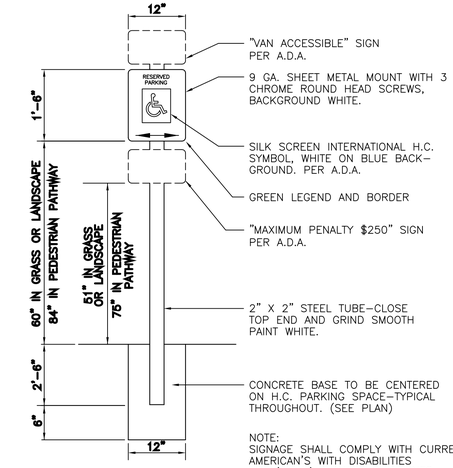
NOT TO SCALE



THE CONTRACTOR SHALL ASSURE TO METRO THAT ALL SERVICES PROVIDED THROUGH THIS CONTRACT SHALL BE COMPLETED IN FULL COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT ("ADA") AND ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD, FEDERAL REGISTER 36 CFR PARTS 1190 AND 1191, ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES; ARCHITECTURAL BARRIERS ACT (ABA) ACCESSIBILITY GUIDELINES; PROPOSED RULE, PUBLISHED IN THE FEDERAL REGISTER ON JULY 23, 2004, AS HAS BEEN ADOPTED BY METRO.

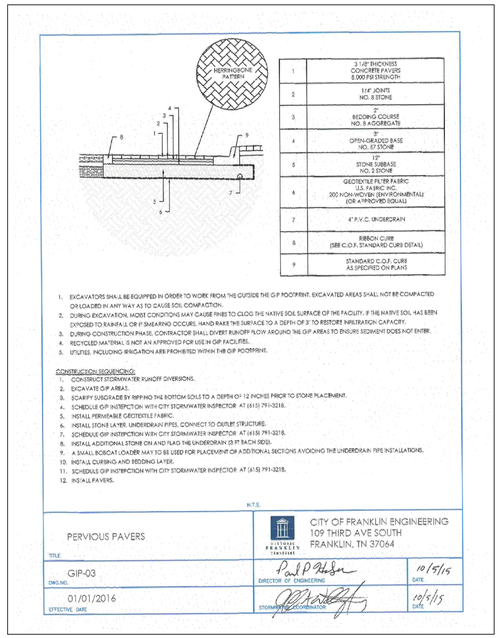
ADA RAMPS

NOT TO SCALE



ADA SIGN

NOT TO SCALE



1. EXCAVATORS SHALL BE EQUIPPED IN ORDER TO WORK FROM THE OUTSIDE THE GIP FOOTPRINT. EXCAVATED AREAS SHALL NOT BE COMPACTED OR LOADED IN ANY WAY AS TO CAUSE SOIL COMPACTION.
2. DURING EXCAVATION, MOIST CONDITIONS MAY CAUSE FINES TO CLOG THE NATIVE SOIL SURFACE OF THE FACILITY. IF THIS NATIVE SOIL HAS BEEN EXPOSED TO RAINFALL OR IT SMEARING OCCURS, HAND RAKE THE SURFACE TO A DEPTH OF 3" TO RESTORE INFILTRATION CAPACITY.
3. DURING CONSTRUCTION PHASE, CONTRACTOR SHALL DIVERT RUNOFF FLOW AROUND THE GIP AREAS TO ENSURE SEDIMENT DOES NOT ENTER.
4. RECYCLED MATERIAL IS NOT AN APPROVED FOR USE IN GIP FACILITIES.
5. UTILITIES, INCLUDING IRRIGATION ARE PROHIBITED WITHIN THE GIP FOOTPRINT.

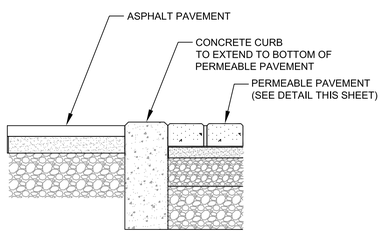
CONSTRUCTION SEQUENCING:
1. CONSTRUCT STORMWATER RUNOFF DIVERSIONS.
2. EXCAVATE GIP AREAS.
3. SCARIFY SUBGRADE BY RIPPING THE BOTTOM SOILS TO A DEPTH OF 12 INCHES PRIOR TO STONE PLACEMENT.
4. SCHEDULE GIP INSPECTION WITH CITY STORMWATER INSPECTOR AT (615) 791-3218.
5. INSTALL PERMEABLE GEOTEXTILE FABRIC.
6. INSTALL STONE LAYER, UNDERDRAIN PIPES, CONNECT TO OUTLET STRUCTURE.
7. SCHEDULE GIP INSTRUCTION WITH CITY STORMWATER INSPECTOR AT (615) 791-3218.
8. INSTALL ADDITIONAL STONE ON AND FLAG THE UNDERDRAIN (3 FT EACH SIDE).
9. A SMALL BOBCAT LOADER MAY TO BE USED FOR PLACEMENT OF ADDITIONAL SECTIONS AVOIDING THE UNDERDRAIN PIPE INSTALLATIONS.
10. INSTALL CURBING AND BEDDING LAYER.
11. SCHEDULE GIP INSPECTION WITH CITY STORMWATER INSPECTOR AT (615) 791-3218.
12. INSTALL PAVERS.

N.T.S.

PERVIOUS PAVERS	CITY OF FRANKLIN ENGINEERING 109 THIRD AVE SOUTH FRANKLIN, TN 37064	
TITLE		
GIP-03	DIRECTOR OF ENGINEERING	10/5/15 DATE
DWG NO.		
01/01/2016	STORMWATER COORDINATOR	10/5/15 DATE
EFFECTIVE DATE		

GIP-03 PERVIOUS PAVERS

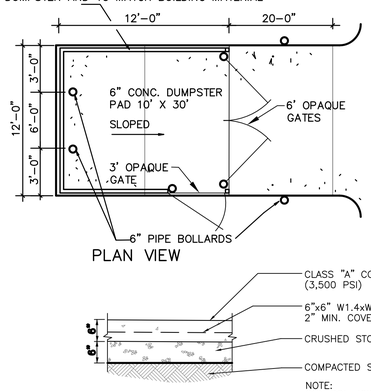
NOT TO SCALE



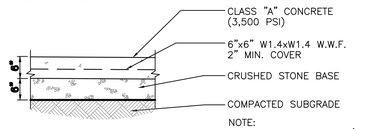
ASPHALT TO PERMEABLE PAVEMENT DETAIL

NOT TO SCALE

SCREEN FENCE/WALL TO BE 6" TALLER
THAN DUMPSTER AND TO MATCH BUILDING MATERIAL



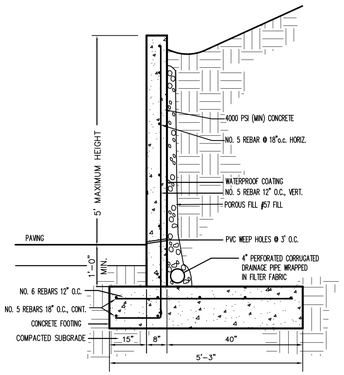
PLAN VIEW



NOTE:
CONTROL JOINT EVERY 5',
EXPANSION JOINT EVERY 25',
UNLESS OTHERWISE NOTED.

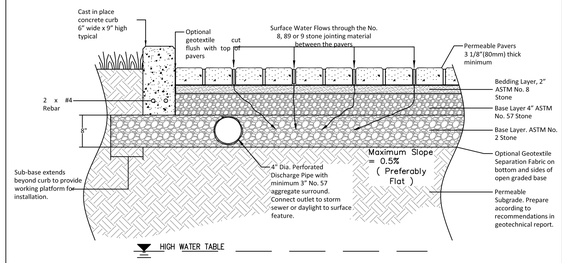
CONCRETE DUMPSTER PAD

NOT TO SCALE



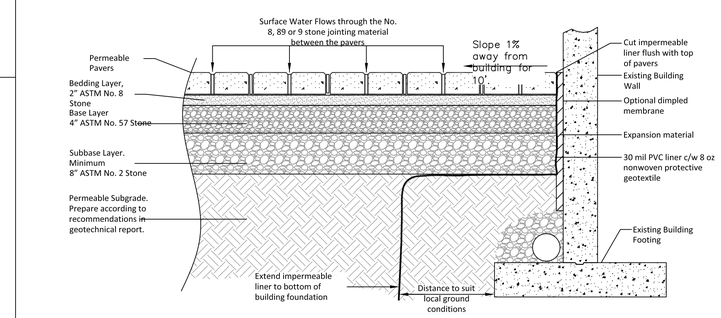
RETAINING WALL

NOT TO SCALE



PERMEABLE PAVEMENT

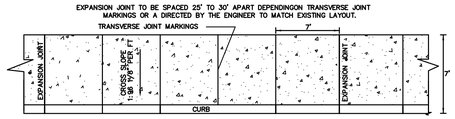
NOT TO SCALE

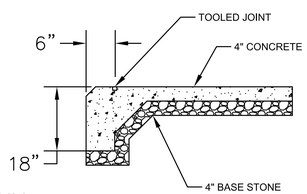


PERMEABLE PAVEMENT AT BUILDING

NOT TO SCALE

EXPANSION JOINT TO BE SPACED 25' TO 30' APART DEPENDINGON TRANSVERSE JOINT MARKINGS OR A DIRECTED BY THE ENGINEER TO MATCH EXISTING LAYOUT.





General Notes:
1. Sidewalks shall be a minimum of 4" in thickness.
2. Maximum cross slope for sidewalks shall not exceed 1:48 (vertical:horizontal)
3. Sidewalk shall be constructed of white concrete, brick or exposed aggregate per City of Franklin Specifications.
4. Compacted stone base, pug mill mix, 4" thick shall be applied to sub grade prior to installing sidewalk.
5. In the event of any conflict, discrepency, or inconsistency among the plans and these standard details, the requirements of the standard details shall govern.

TURNDOWN SIDEWALK

NOT TO SCALE

GARY LYNN EARLY
REGISTERED LANDSCAPE ARCHITECT
STATE OF TENNESSEE
4/7/2016

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

Being Parcels 73.00 & 74.01 on Tax Map 53

554 FRANKLIN ROAD

Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

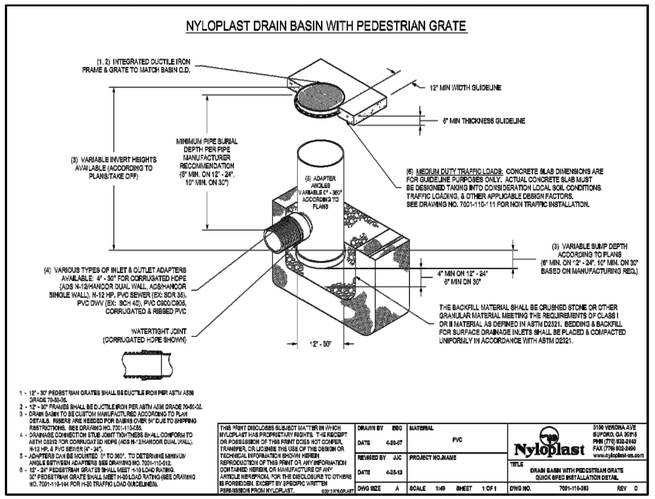
- PLAN DATE: March 7, 2016
- PLAN REVISION DATE: April 7, 2016

NONE
NONE
NONE
NONE

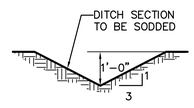
SITE DETAILS

C6.0

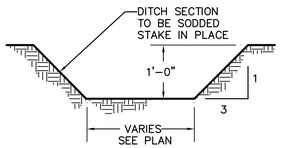
11 of 14



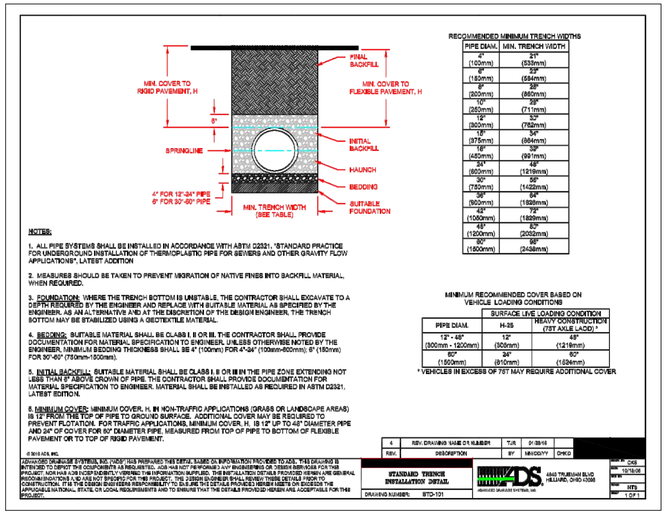
NYLOPLAST AREA DRAIN
NOT TO SCALE



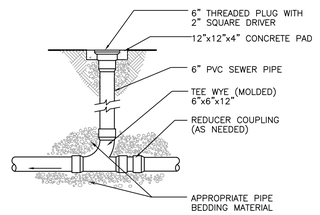
V-DITCH
NOT TO SCALE



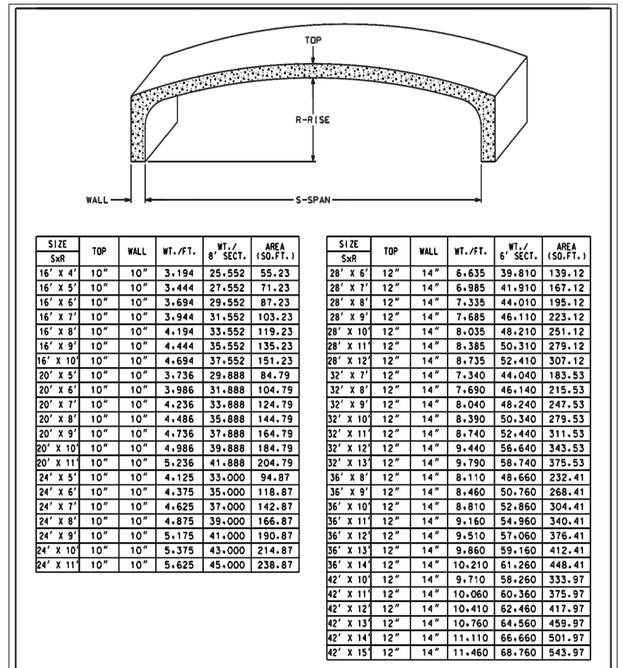
TRAPEZOIDAL SWALE
NOT TO SCALE



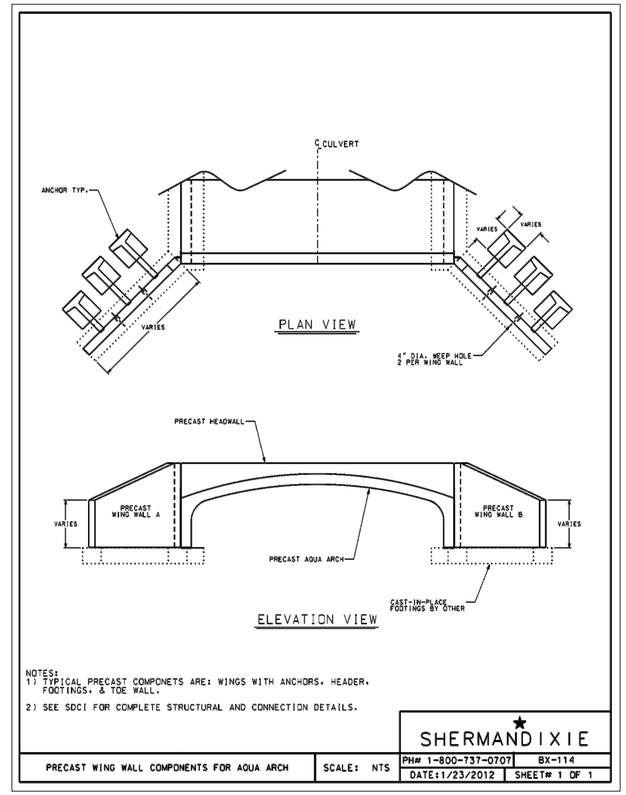
HDPE PIPE BEDDING
NOT TO SCALE



PERMEABLE PAVEMENT OBSERVATION WELL
NOT TO SCALE



16'X7' AQUA ARCH (STRUCTURE 17-18)
NOT TO SCALE



AQUA ARCH HEADWALL
NOT TO SCALE

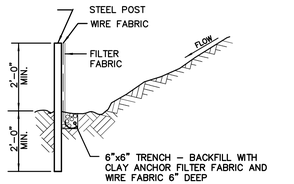
GARY LYNN EARLY
REGISTERED LANDSCAPE ARCHITECT
AGRICULTURE
COMMERCE
No. 1117
STATE OF TENNESSEE
4/7/2016

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision
Site Plan - Lot 1 (Funeral Home)
Being Parcels 73.00 & 74.01 on Tax Map 53
554 FRANKLIN ROAD
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:
- PLAN DATE: March 7, 2016
- PLAN REVISION DATE: April 7, 2016
A NONE
B NONE
C NONE
D NONE

SITE DETAILS
C6.1
12 of 14



NOTES:

NOTES:

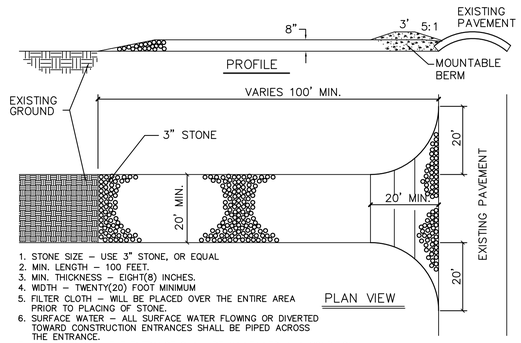
Excavate a 6" x 6" trench for toe of silt fence burial.
Install steel post 10' center to center (maximum).
Drive post into the ground at least 2' deep.
Securely attach the metal fence to the steel post.
Use hog rings (or equivalent) to secure the silt fence to the metal fence.
Bury the toe of the silt fence with the previously excavated material and tamp in place to secure the toe of the fence.
Inspect the installation on a regular basis and make repairs as needed.

Reference Franklin detail SD–21 for correct installation of silt fence.

PERIMETER SILTATION CONTROL SHALL BE INSTALLED PER CITY DETAIL SD–21.

SILT FENCE

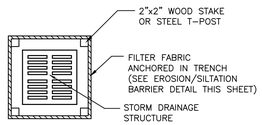
NOT TO SCALE



1. STONE SIZE – USE 3" STONE, OR EQUAL
2. MIN. LENGTH – 100 FEET.
3. MIN. THICKNESS – EIGHT(8) INCHES.
4. WIDTH – TWENTY(20) FOOT MINIMUM
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.

CONSTRUCTION EXIT

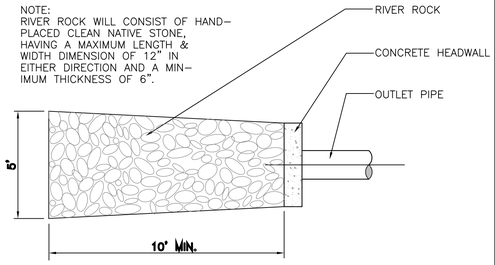
NOT TO SCALE



INLET PROTECTION

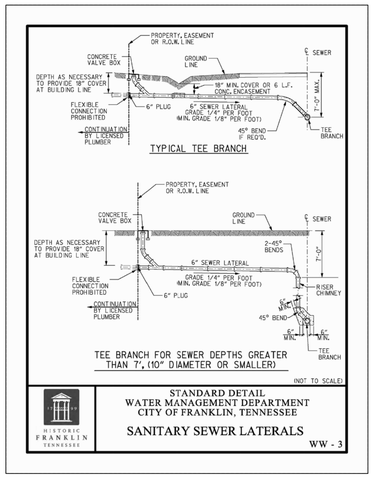
NOT TO SCALE

NOTE:
RIVER ROCK WILL CONSIST OF HAND–PLACED CLEAN NATIVE STONE, HAVING A MAXIMUM LENGTH & WIDTH DIMENSION OF 12" IN EITHER DIRECTION AND A MIN–IMUM THICKNESS OF 6".



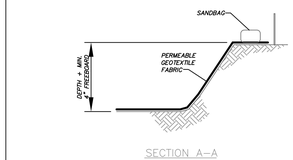
OUTLET PROTECTION

NOT TO SCALE

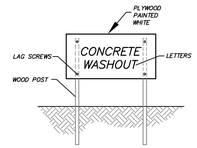


6" SEWER LATERAL

NOT TO SCALE



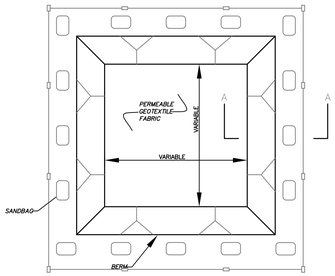
SECTION A–A
NOT TO SCALE



CONCRETE WASHOUT SIGN (OR EQUIVALENT)

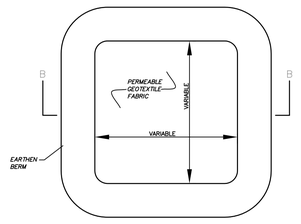
SECTION B–B
NOT TO SCALE

NOTES:
1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. SIGNAGE IDENTIFYING THE CONCRETE WASHOUT AREA SHALL BE INSTALLED WITHIN 5FT.OF THE WASHOUT FACILITY.



PLAN VIEW
NOT TO SCALE

TYPE "BELOW GRADE"



PLAN VIEW
NOT TO SCALE

TYPE "ABOVE GRADE" WITH EATHERN BERMS

CONCRETE WASH DOWN AREA

NOT TO SCALE

GARY LYNN EARLY
REGISTERED LANDSCAPE ARCHITECT
DEPARTMENT OF AGRICULTURE
COMMERCE
No. 1117
STATE OF TENNESSEE
4/7/2016

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

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554 FRANKLIN ROAD
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

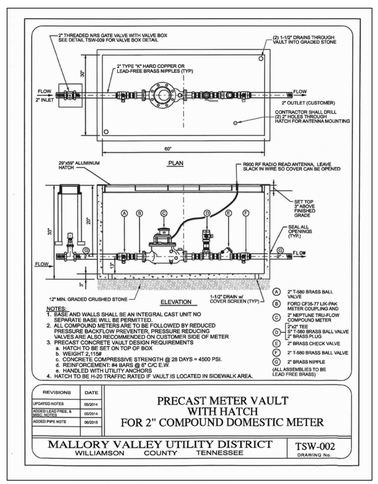
- PLAN DATE: March 7, 2016
- PLAN REVISION DATE: April 7, 2016

A NONE
B NONE
C NONE
D NONE

SITE DETAILS

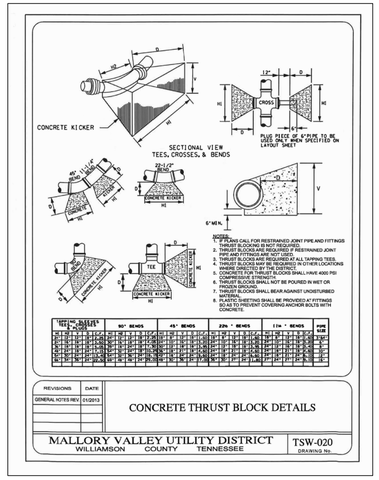
C6.2

13 of 14



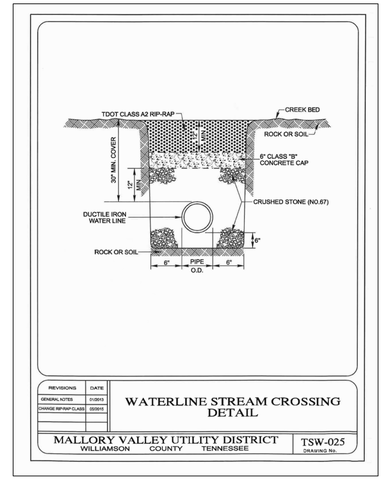
2" DOMESTIC METER

NOT TO SCALE



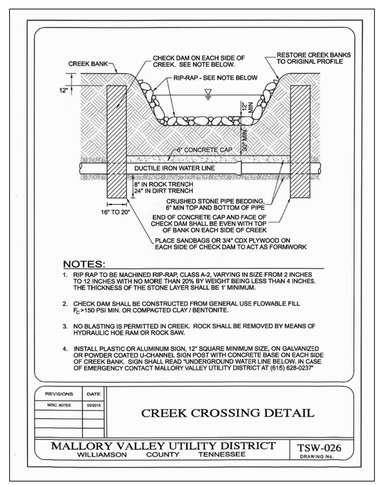
THRUST BLOCK DETAILS

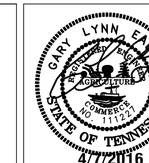
NOT TO SCALE



STREAM CROSSING DETAILS

NOT TO SCALE





4/7/2016

LAND SOLUTIONS
COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

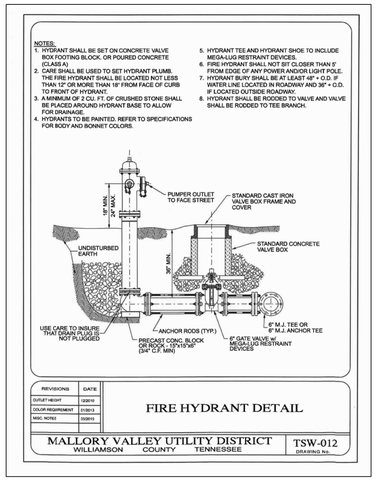
Family Legacy PUD Subdivision

Site Plan - Lot 1 (Funeral Home)

Being Parcels 73.00 & 74.01 on Tax Map 53

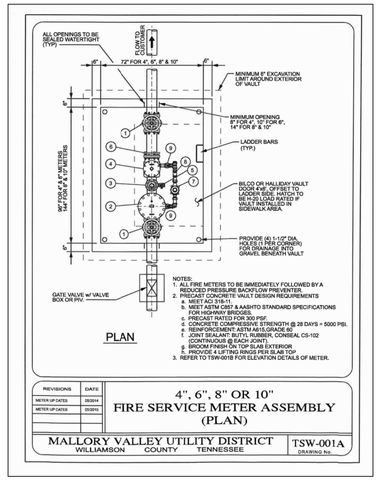
554 FRANKLIN ROAD

Franklin, Williamson County, Tennessee



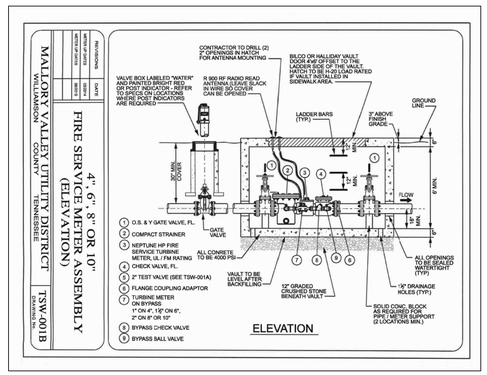
FIRE HYDRANT

NOT TO SCALE



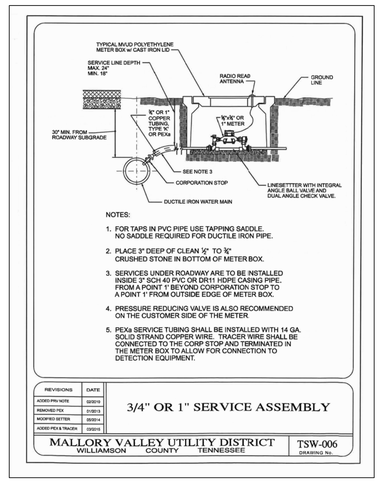
FIRE METER ASSEMBLY

NOT TO SCALE



FIRE METER ASSEMBLY

NOT TO SCALE



WATER SERVICE ASSEMBLY

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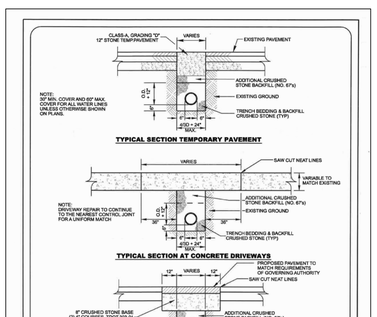
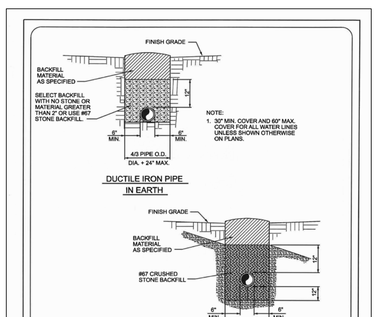


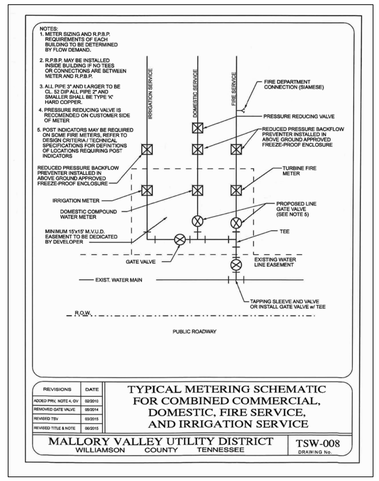
TRENCH DETAIL - TRAFFIC AREAS

NOT TO SCALE



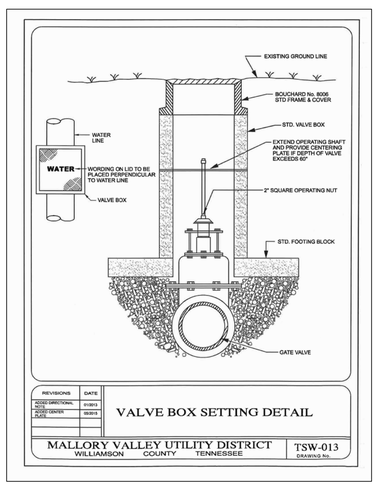
TRENCH DETAIL - NON-PAVED AREAS

NOT TO SCALE



WATER CONNECTION SCHEMATIC (TSW-008)

NOT TO SCALE



VALVE BOX DETAIL

NOT TO SCALE

ISSUANCE/REVISION NOTES:

- PLAN DATE: March 7, 2016
- PLAN REVISION DATE: April 7, 2016

A NONE
B NONE
C NONE
D NONE

SITE DETAILS

C6.3

14 OF 14

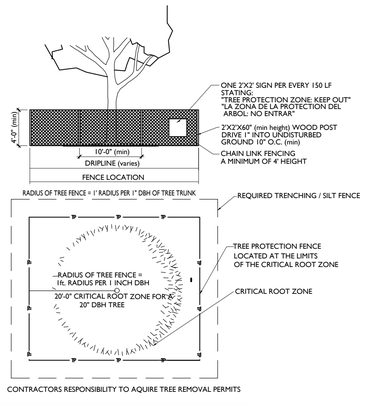
GRAPHIC SCALE 1"=40'

40 0 40 80

KEY:

SURVEYED TREE

REMOVED SPECIMEN TREE



CONTRACTORS RESPONSIBILITY TO AQUIRE TREE REMOVAL PERMITS

TREE PROTECTION FENCING DETAIL

TREE PROTECTION NOTES:

1. The tree protection barriers shall be constructed before the issuance of any permits, and shall remain intact throughout the entire period of construction.

2. The tree protection barrier shall be installed as labeled on this plan or a distance to the radius of the dripline, whichever is greatest, as measured from the trunk of the protected tree.

3. Any required excavation in or around the protection zone to accommodate underground services, footings, etc; shall be indicated on the plan, and shall be excavated by hand. In addition, related root pruning shall be accomplished via ANSI A-300-95 standard so as to minimize impact on the general root system.

4. The storage of building materials or stock piling shall not be permitted within the limits of or against the protection barriers.

5. Trees within the protection barriers must be adequately cared for throughout the construction process (i.e., they must be watered sufficiently). Fill shall not be placed upon the root system as to endanger the health or life of the affected tree.

SPECIMEN TREE REPLACEMENT

	COF#	SPECIMEN DBH REMOVED	REPLACEMENT REQUIRED	REPLACEMENT PROVIDED	TOTAL
					--
LOT 1 SITE PLAN	XXXX	134 IN	248 IN	233	233
					-15

PUD TREE PRESERVATION DATA

TOTAL PUD AREA	22.72 AC
EXISTING TREE CANOPY	+/- 72% OF SITE
MINIMUM RETENTION	.72 x .18 = 13% OF SITE
	128,636 SF OR 2.95 ACRES
PROPOSED RETENTION	68.8% OF SITE
PROPOSED RETENTION	680,787 SF OR `5.63 ACRES

ALL TREES ABOVE HHO OVERLAY TO REMAIN

SPECIMEN TREES TO BE REMOVED

DBH SIZE / VARIETY	CONDITION
24" SYCAMORE	GOOD
24" OAK	POOR
28" SYCAMORE	REMOVED WITH SEWER EXTENSION TO BRANCH CREEK
24" OAK	GOOD
24" OAK	GOOD
30" SILVER MAPLE	NUISANCE TREE*
26" SILVER MAPLE	NUISANCE TREE*
28" ASH	POOR
28" HACKBERRY	GOOD
24" HACKBERRY	POOR
24" CEDAR	GOOD
40" HACKBERRY	POOR

TOTAL HEALTHY INCHES REMOVED: 124 "

TOTAL SPECIMEN REPLACEMENT REQUIRED: 248"

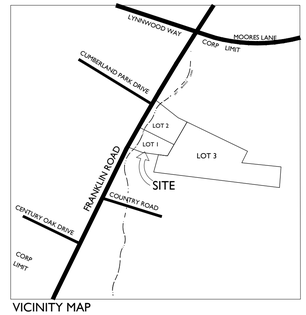
*NOTE: THE CITY OF FRANKLIN CLASSIFIES SILVER MAPLE (Acer saccharinum) AS A NUISANCE TREE

TREES DESIGNATED AS POOR EXHIBIT SEVERE PEST OR PHYSICAL DAMAGE, SUCH AS COMMON FROM LIGHTNING OR WIND DAMAGE, OR HAVE BEEN "TOPPED" AND ARE IN A WEAKENED CONDITION.

TREE REMOVAL/PRESERVATION PLAN

SITE DATA:

PROJECT NAME:	FAMILY LEGACY PUD SUBDIVISION, SITE PLAN, LOT 1 (FUNERAL HOME)
PROJECT NUMBER:	6072
SUBDIVISION:	FAMILY LEGACY PUD SUBDIVISION
LOT NUMBER:	1
ADDRESS:	554 FRANKLIN ROAD
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
SITE ACREAGE:	3.72 AC
SITE ZONING CLASSIFICATION:	SD-X 0/34,500
DEVELOPMENT STANDARDS:	TRADITIONAL
MINIMUM REQUIRED LSA:	.20 RATIO AND .75 AC
PROVIDED LSA:	.37 RATIO AND 1.36 AC
ORIGINAL CANOPY COVER:	
TREE CANOPY REQUIRED:	18 %, 2.95 AC (TOTAL SITE)
TREE CANOPY PROVIDED:	68.8%, 5.63 AC (TOTAL SITE)
SPECIMEN TREES REMOVED:	11 TREES, 124 HEALTHY INCHES



VICINITY MAP

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision
Site Plan, Lot 1 (Funeral Home)
Franklin, Williamson County, Tennessee

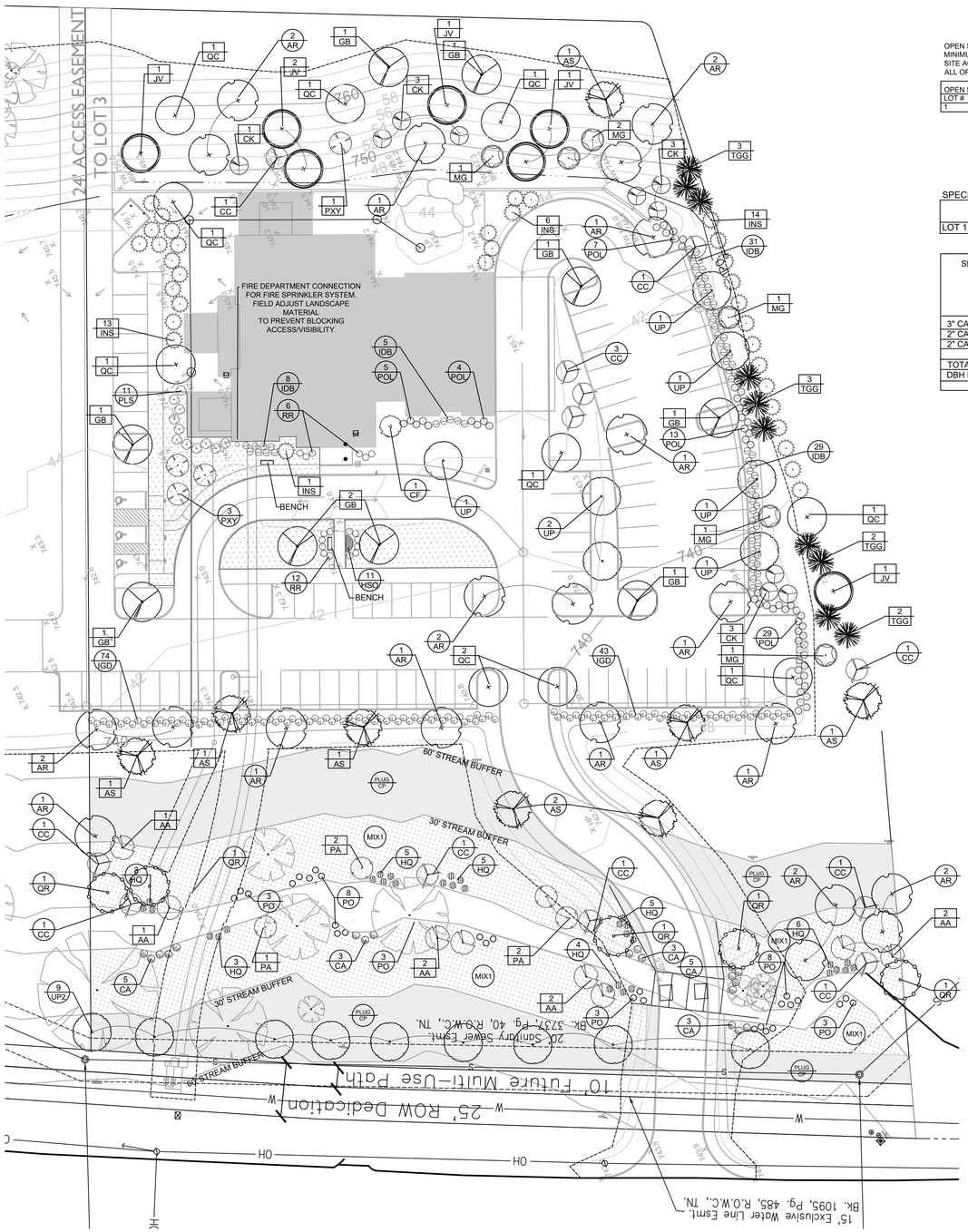
ISSUANCE/REVISION NOTES:
- PLAN DATE: March 14, 2016

1 April 7, 2016
NONE
NONE
NONE

GREGORY C. GAMBLE
TENNESSEE
REGISTERED
LANDSCAPE ARCHITECT

TREE REMOVAL

L1.0


24' ACCESS EASEMENT TO LOT 3
FIRE DEPARTMENT CONNECTION FOR FIRE SPRINKLER SYSTEM. FIELD ADJUST LANDSCAPE MATERIAL TO PREVENT BLOCKING ACCESS/VISIBILITY.
BENCH
BENCH
60' STREAM BUFFER
30' STREAM BUFFER
30' STREAM BUFFER
60' STREAM BUFFER
PLUG OF
W 25' ROW Dedication
10' Future Multi-Use Path
20' Sanitary Sewer Esmt. Bk. 3737, Pg. 40, R.O.W.C., TN.
15' Exclusive Water Line Esmt. Bk. 1095, Pg. 485, R.O.W.C., TN.
OH
OH
W
S
S
760
750
740
740
740
42
44
44
42
42
58
56
54
52
50
48
46
X 762
X 763
X 763
X 762
X 763
X 762
X 763
X 762

CITY OF FRANKLIN LANDSCAPE NOTES:

1. ANY PLANT MATERIAL THAT DIES, TURNS BROWN OR DEFOLIATES SHALL BE REPLACED WITHIN ONE YEAR OR BY THE NEXT GROWING SEASON, WHICH EVER COMES FIRST. OTHER DEFECTIVE LANDSCAPE MATERIAL SHALL BE REPLACED WITHIN THREE MONTHS.

2. ALL TREES SHALL MEET FRANKLIN'S MINIMUM SIZE AND QUALITY STANDARDS. ALL PLANTS SHALL BE HEALTHY, VIGOROUS MATERIAL, FREE OF PEST AND DISEASE. ALL ROOTBALLS, CONTAINERS, AND HEIGHT TO WIDTH RATIOS SHALL CONFORM TO THE SIZE STANDARDS SET FORTH IN THE AMERICAN STANDARDS FOR NURSERY STOCK, CURRENT EDITION.

3. ALL REQUIRED TREES AND SHRUBS SHALL MEET THE MINIMUM SIZE AND QUANTITY AS LISTED IN THE PLANT SCHEDULE.

4. PLANT MATERIAL SHALL NOT OBSCURE TRAFFIC OR PARKING SIGNS/SIGNALS OR VEHICULAR SIGHT LINES.

5. TREE TOPPING IS NOT PERMITTED.

6. ADDITIONAL SCREENING MAY BE REQUIRED IF THE INSPECTION FOR THE RELEASE OF THE PERFORMANCE SURETY REVEALS THAT THE REQUIRED SCREENING IS NOT EFFECTIVE.

7. ALL REQUIRED TREE PROTECTION FENCING SHALL BE INSTALLED AND INSPECTED BY THE CODES DEPARTMENT PRIOR TO LAND DISTURBING ACTIVITIES.

8. ANY SITE OR LANDSCAPE CHANGES (INCLUDING BUT NOT LIMITED TO A CHANGE IN DESIGN, A REDUCTION IN SIZE OR NUMBER OF PLANT MATERIAL, OR THE RELOCATION OF OVERHEAD OR UNDERGROUND UTILITIES) SHALL REQUIRE A REVISED LANDSCAPE PLAN TO BE SUBMITTED AND APPROVAL PRIOR TO THE LANDSCAPE INSTALLATION.

9. EXISTING TREES ACCEPTED IN PARTIAL COMPLIANCE OF THE LANDSCAPE REQUIREMENTS FOR THIS SITE SHALL BE ACCESSIBLE AND FLAGGED PRIOR TO ALL LANDSCAPE INSPECTIONS.

10. ANY EXISTING TREE, SHOWN AS BEING PRESERVED ON APPROVED PLANS THAT IS REMOVED, DIES OR IS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AS REQUIRED IN THE ZONING ORDINANCE.

11. SCREENING PROPOSED AROUND ANY UTILITY BOX OR TRANSFORMER IS REQUIRED TO BE EVERGREEN AND ADEQUATELY SCREEN THE OBJECT. THE PROPOSED EVERGREEN PLANT MATERIAL SHALL BE REPLACED IF IT IS NOT OF A HEIGHT SUFFICIENT TO SCREEN THE OBJECT.

12. ALL PLANT MATERIAL SHALL BE FROM THE FRANKLIN PLANT LIST UNLESS PRIOR APPROVAL IS RECEIVED FROM THE CITY.

13. ALL TREE-PROTECTION FENCING SHALL BE IN PLACE PRIOR TO THE ISSUANCE OF A GRADING PERMIT AND SHALL BE MAINTAINED IN GOOD WORKING ORDER UNTIL ALL CONSTRUCTION ACTIVITY IS COMPLETED. ANY REQUIRED EROSION CONTROL MEASURES SHALL BE PLACED OUTSIDE OF ANY TREE PROTECTION FENCING.

14. TOP SOIL USED IN ALL LANDSCAPE AREAS SHALL BE SCREENED PRIOR TO DEPOSITION IN PLANTING AREAS AND ISLANDS.

15. ANY PLANT MATERIAL LOCATED ADJACENT TO A PARKING AREA SHALL BE PLANTED SO AS TO ALLOW FOR A TWO AND A HALF FOOT VEHICULAR BUMPER OVERHANG FROM THE FACE OF CURB TO THE EDGE OF THE MATURE ADJACENT PLAN MATERIAL.

16. THE OWNER ACKNOWLEDGES THAT PLANTING LANDSCAPE MATERIAL IN A DEDICATED EASEMENT DOES NOT WAIVE OR MODIFY THE CITY OF FRANKLIN'S RIGHTS AS THE EASEMENT HOLDER. THE OWNER UNDERSTANDS THAT THE CITY OF FRANKLIN, ITS AUTHORIZED CONTRACTOR OR APPLICABLE PRIVATE UTILITY MAY AT ANY TIME AND FOR ANY REASON PERFORM WORK WITHIN THE DEDICATED EASEMENT. THE CITY, ITS AUTHORIZED CONTRACTOR OR APPLICABLE PRIVATE UTILITY SHALL HAVE NO LIABILITY TO THE OWNER FOR ANY DAMAGE TO THE LANDSCAPE MATERIAL IN THE EASEMENT WHEN SAID DAMAGE IS DUE TO WORK WITHIN THE EASEMENT. THE OWNER MAY BE HELD RESPONSIBLE FOR THE REMOVAL OF THE LANDSCAPE MATERIAL TO ENABLE WORK TO BE DONE. THE OWNER SHALL BE SOLELY RESPONSIBLE FOR ANY COST INCURRED IN REPAIRING AND/OR REPLACING THE REQUIRED LANDSCAPE MATERIAL.

CITY OF FRANKLIN MINIMUM PLANT QUALITY AND SIZE STANDARDS

1. ALL NEWLY PLANTED LANDSCAPE PLANT MATERIALS SHALL CONFORM TO THE LATEST VERSIONS OF THE AMERICAN STANDARD OF NURSERY STOCK (ANSI Z60.

2. ALL TYPE 1, 2, AND 3 TREES (AS DEFINED IN ANSI Z60.1) USED TO MEET THE REQUIREMENTS OF THIS SUBSECTION SHALL HAVE THE FOLLOWING CHARACTERISTICS:

A. DECIDUOUS TREES SHALL HAVE ONE DOMINANT TRUNK WITH THE TIP OF THE LEADER ON THE MAIN TRUNK LEFT INTACT AND THE TERMINAL BUD ON THE CENTRAL LEADER AT THE HIGHEST POINT ON THE TREE.

B. TREES WITH FORKED TRUNKS ARE ACCEPTABLE IF ALL THE FOLLOWING CONDITIONS ARE MET:
1. THE FORK OCCURS IN THE UPPER ONE-THIRD OF THE TREE.
2. ONE FORK IS LESS THAN TWO-THIRDS OF THE TREE.
3. THE TOP ONE-THIRD OF THE SMALLER FORK IS REMOVED AT THE TIME OF PLANTING.

C. NO BRANCH IS GREATER THAN TWO-THIRDS THE DIAMETER OF THE TRUNK DIRECTLY ABOVE THE BRANCH.

D. SEVERAL BRANCHES ARE LAGER IN DIAMETER AND OBVIOUSLY MORE DOMINANT.

E. BRANCHING HABIT IS MORE HORIZONTAL THAN VERTICAL AND NO BRANCHES ARE ORIENTED NEARLY VERTICAL TO THE TRUNK.

F. BRANCHES ARE EVENLY DISTRIBUTED AROUND THE TRUNK WITH NO MORE THANK ONE MAJOR BRANCH LOCATED DIRECTLY ABOVE ANOTHER AND THE CROWN IS FULL OF FOLIAGE THAT IS EVENLY DISTRIBUTED AROUND THE TREE.

TREE PROTECTION GENERAL NOTES:

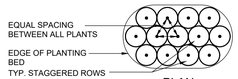
1. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL STAKE THE LIMITS OF THE TREE PRESERVATION AREAS AND ASSOCIATED TREE CANOPY.

2. TREE PROTECTION FENCING, ORANGE PLASTIC BARRIER CONSTRUCTION FENCING, SHALL BE INSTALLED AND MAINTAINED AT THE LIMITS OF THE TREE PRESERVATION AREAS PRIOR TO CONSTRUCTION. REVIEW AND APPROVAL OF THE FENCING BY THE CITY OF FRANKLIN IS REQUIRED PRIOR TO GRADING PERMIT.

3. ALL GRADING WITHIN THE ROOT ZONE OF TREES WITHIN THE TREE PRESERVATION AREAS SHALL BE DONE BY HAND OR WITH SMALL EQUIPMENT TO REDUCE DAMAGE TO THE TREE ROOTS.

4. EQUIPMENT STORAGE AND/OR MATERIALS STORAGE WITHIN THE TREE PRESERVATION AREA IS STRICKLY PROHIBITED.

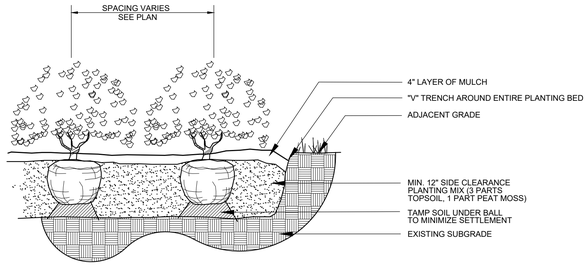
5. ROOTS EXPOSED BY CONSTRUCITON ACTIVITES SHALL BE PRUNED FLUSH WITH THE GROUND AND/OR BACKFILLED WITH TOP SOIL AS SOON AS POSSIBLE.



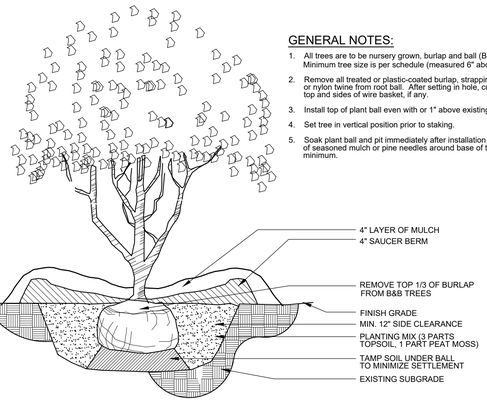
PLAN

GENERAL NOTES:

1. Install top of plant ball 2" above adjacent grade.
2. Tamp planting mix firmly as pit is filled around each plant ball.
3. Soak each plant ball and pit immediately after installation.



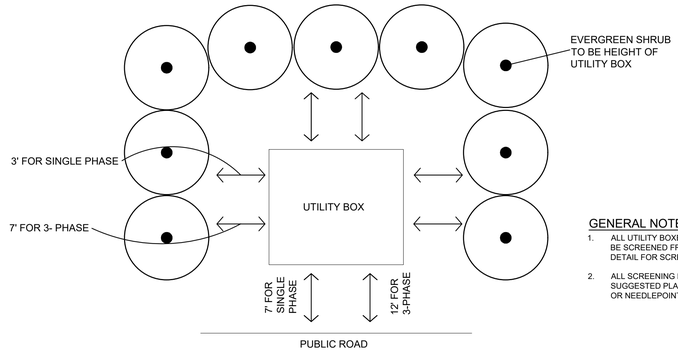
1 / L3.0 — SHRUB PLANTING — DETAIL #
PLAN/ SECTION — NTS



GENERAL NOTES:

1. All trees are to be nursery grown, burlap and ball (B&B). Minimum tree size is per schedule (measured 6" above root ball).
2. Remove all treated or plastic-coated burlap, strapping, wire or nylon twine from root ball. After setting in hole, cut away top and sides of wire basket, if any.
3. Install top of plant ball even with or 1" above existing grade.
4. Set tree in vertical position prior to staking.
5. Soak plant ball and pit immediately after installation. Place 4-6" of seasoned mulch or pine needles around base of tree, 3' diameter minimum.

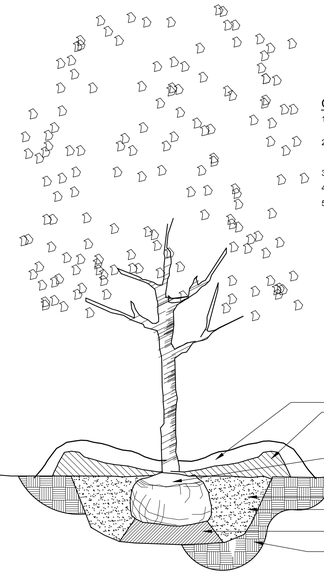
2 / L3.0 — UNDERSTORY TREE — DETAIL #
SECTION — NTS



GENERAL NOTES:

1. ALL UTILITY BOXES AND METERS MUST BE SCREENED FROM VIEW. PLEASE USE THIS STANDARD DETAIL FOR SCREENING REQUIREMENTS.
2. ALL SCREENING PLAN MATERIAL SHALL BE EVERGREEN. SUGGESTED PLAN MATERIAL TO INCLUDE: INKBERRY HOLLY OR NEEDLEPOINT HOLLY.

3 / L3.0 — UTILITY BOX SCREEN — DETAIL #
NTS



GENERAL NOTES:

1. All trees are to be nursery grown, burlap and ball (B&B). Minimum tree size is per schedule (measured 6" above root ball).
2. Remove all treated or plastic-coated burlap, strapping, wire or nylon twine from root ball. After setting in hole, cut away top and sides of wire basket, if any.
3. Install top of plant ball even with or 1" above existing grade.
4. Set tree in vertical position prior to staking.
5. Soak plant ball and pit immediately after installation. Place 4-6" of seasoned mulch or pine needles around base of tree, 3' diameter minimum.

3 / L3.0 — SINGLE TRUNK DECIDUOUS TREE — DETAIL #
SECTION — NTS

LANDSCAPE PLANTING GENERAL NOTES

1. THE LANDSCAPE CONTACTOR SHALL BE RESPONSIBLE FOR CONFIRMING THE QUANITIES OF ALL MATERIALS. THE QUANTIES ON THE PLAN SHALL TAKE PRECEDENCE OVER THE PLANT LIST.

2. SUBSTITUTIONS OF TYPE, SIZE, OR SPACING OF PLANTS MAY NOT BE MADE WITHOUT PRIOR APPROVAL OF THE OWNER'S LANDSCAPE ARCHITECT, AND MAY RESULT IN THE RESUBMITTAL OF LANDSCAPE PLANS TO THE CITY OF FRANKLIN FOR APPROVAL PRIOR TO INSTALLATION.

3. ALL CONSTRUCTION ACTIVITY SHALL BE COORDINATED WITH TENNESSEE ONE CALL PRIOR TO DIGGING. ALL DAMAGE TO UTILITES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE PER UTILITY PROVIDER'S STANDARDS.

4. THE PLANT LIST SPECIFICATIONS PROVIDED WITHIN THE PLANT LIST FOR HEIGHT AND SIZE ARE MINIMUMS.

5. ALL PLANT BEDS SHALL BE RAKED AND CLEARED OF LARGE ROCKS. ALL LARGE DIRT CLODS SHALL BE PULVERIZED OR REMOVED PRIOR TO PLANTING.

6. ALL LARGE DIRT CLODS RESULTING FROM PLANTING SHALL BE PULVERIZED AND REMOVED PRIOR TO MULCHING.

7. PRE-EMERGINT HERBICIDE SHALL BE APPLIED AFTER INSTALLATION AND IMMEDIATELY PRIOR TO MULCHING.

8. ALL PLANT BEDS ARE TO BE MULCHED WITH A MINIMUM OF 4 INCHES OF SHREDDED PINE BARK. ALL ANNUAL BEDS SHALL BE MULCHED WITH A MINIMUM OF 2 INCHES OF SOIL CONDITIONER, PINE BARK FINES.

9. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANT MATERIAL OR ANY DEFECTIVE WORKMANSHIP.

10. ALL SOD AREAS SHALL BE TILLED AND RAKED SMOOTH, WITH LARGE DIRT CLODS AND ROCKS REMOVED, PRIOR TO SOD INSTALLATION.

11. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL STAKING AND LAYOUT OF PLANT BEDS.

12. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE DRAINAGE OF ALL TREE AND SHRUB PITS. A PVC OR GRAVEL SUMP AT THE BASE OF THE TREE WELL MAY BE REQUIRED IN AREAS WHERE CLAY SOILS DO NOT ADEQUATELY DRAIN.

13. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT WHEN THE PLANT MATERIALS ARE AT THE JOB SITE FOR REVIEW PRIOR TO INSTALLATION.

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

Landscape Architecture Provided by:
Gamble Design Collaborative, LLC
Greg Gamble, RLA
144 Southeast Parkway, Suite 200
Franklin, Tennessee 37064
615.975.5765
greggamble209@gmail.com

LANDSCAPE DETAILS

LAND SOLUTIONS
COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

Family Legacy PUD Subdivision
Site Plan, Lot 1
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:
– PLAN DATE: March 14, 2016

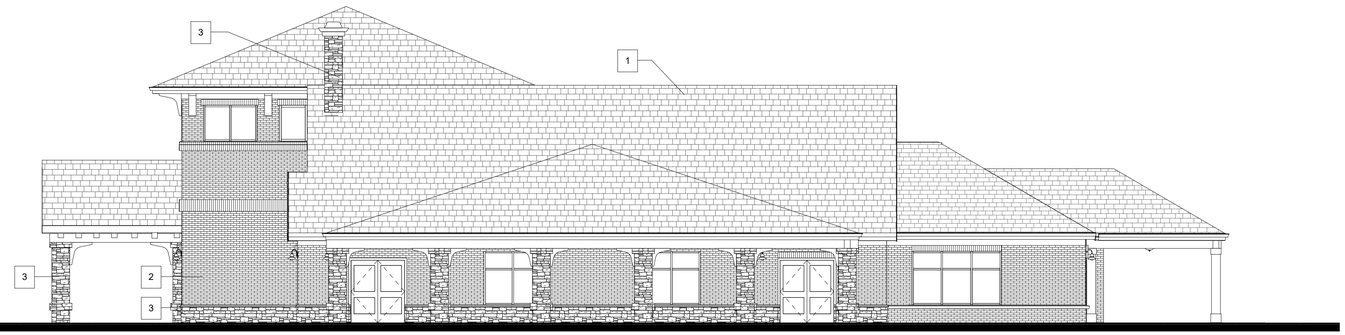
A 1. APRIL 7, 2016
B NONE
C NONE
D NONE

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT

LANDSCAPE DETAILS
L3.0

1 SOUTH ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'



2 EAST ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'

MATERIALS PROPORTION LEGEND

SOUTH ELEVATION

GROSS AREA OF WALL	2,331 sf	N/A
NET AREA OF WALL	1,568 sf	N/A
NET BRICK VENEER AREA	729 sf	46%
NET WOOD AREA	301 sf	19 %
NET STONE VENEER AREA	538 sf	35 %

EAST ELEVATION

GROSS AREA OF WALL	1,415 sf	N/A
NET AREA OF WALL	1,083 sf	N/A
NET BRICK VENEER AREA	932 sf	86%
NET WOOD AREA	0 sf	0
NET STONE VENEER AREA	151 sf	14 %

MATERIALS LEGEND

1 ARCHITECTURAL SHINGLE ROOF

2 BRICK VENEER - RED

3 STONE VENEER - TANNISH GREY

4 FIBER CEMENT PANELS (CRAFTSMAN GREEN) & WOOD BATTENS - CHERRY FIN.

5 ALUM. CLAD WINDOWS

THESE ELEVATIONS HAVE BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN'S ARCHITECTURAL DESIGN STANDARDS AND TO MEET THE APPROVAL OF THE PLANNING COMMISSION AND SECTION 5.3 OF THE ZONING ORDINANCE. CHANGES SHALL NOT BE MADE TO THE APROVED ELEVATIONS UNLESS APPROVED BY EITHER THE BNS/CODES DIRECTOR OR THE PLANNING COMMISSION.

FRANKLIN CODES DEPARTMENT (615) 794-7012
FRANKLIN PLANNING DEPARTMENT (615) 791-3212

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

906 STUDIO ARCHITECTS
MICHAEL A. HATHAWAY, AIA
(615) 599-1906
906studio.com
142 Fifth Avenue South
Franklin, TN 37064

A Family Legacy Subdivision

Building Elevations

Being Parcels 73.00 & 74.01 on Tax Map 53
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

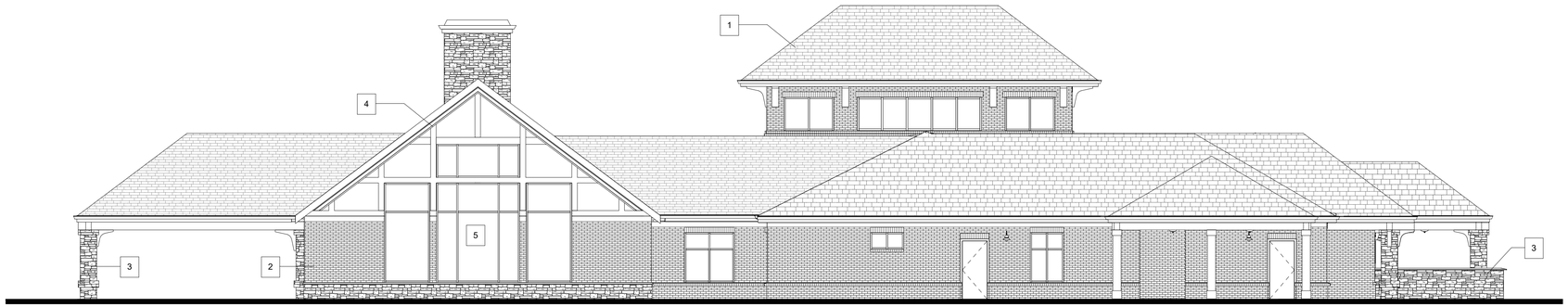
- PLAN DATE: November 11, 2015
- ELEVATION DATE: March 14, 2016

MICHAEL A. HATHAWAY
REGISTERED ARCHITECT
STATE OF TENNESSEE

BUILDING ELEVATIONS

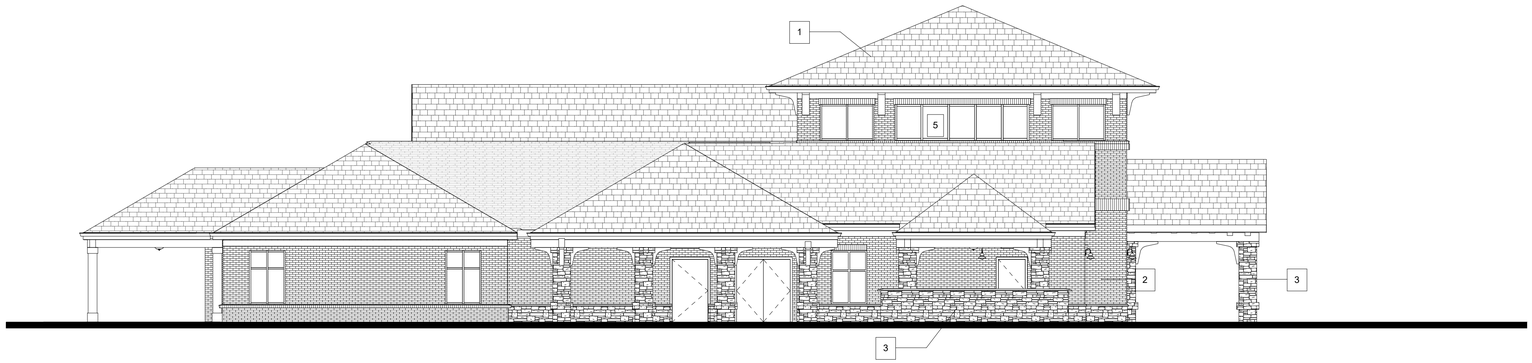
A1.0

SHEET 1 OF 4



1 NORTH ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'



2 WEST ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'

MATERIALS PROPORTION LEGEND

NORTH ELEVATION

GROSS AREA OF WALL	1,913 sf	N/A
NET AREA OF WALL	1,408 sf	N/A
NET BRICK VENEER AREA	1,017 sf	72%
NET WOOD AREA	196 sf	14%
NET STONE VENEER AREA	195 sf	14 %

WEST ELEVATION

	SURFACE AREA	% OF NET
GROSS AREA OF WALL	1,384 sf	N/A
NET AREA OF WALL	1,113 sf	N/A
NET BRICK VENEER AREA	969 sf	87%
NET WOOD AREA	0 sf	0
NET STONE VENEER AREA	144 sf	13 %

MATERIALS LEGEND

1 ARCHITECTURAL SHINGLE ROOF

2 BRICK VENEER - RED

3 STONE VENEER - TANNISH GREY

4 FIBER CEMENT PANELS (CRAFTSMAN GREEN) & WOOD BATTENS - CHERRY FIN.

5 ALUM. CLAD WINDOWS

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FRANKLIN CODES DEPARTMENT (615) 794-7012
FRANKLIN PLANNING DEPARTMENT (615) 791-3212

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

906 STUDIO ARCHITECTS
615.599.0906
906studio.com
1421 Hillsboro Circle
Franklin, TN 37064

A Family Legacy Subdivision

Building Elevations

Being Parcels 73.00 & 74.01 on Tax Map 53
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

- PLAN DATE: November 11, 2015
- ELEVATION DATE: March 14, 2016

MICHAEL A. HATHAWAY
REGISTERED ARCHITECT
AGRICULTURE
LICENSE
2007
STATE OF TENNESSEE
3/14/16

BUILDING ELEVATIONS

A2.0

1 SOUTH ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'

2 EAST ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'

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FRANKLIN PLANNING DEPARTMENT (615) 791-3212

LAND SOLUTIONS COMPANY, LLC
2925 Berry Hill Drive, Nashville, TN 37204

906 STUDIO ARCHITECTS
MICHAEL A. HATHWAY
1417 Fifth Avenue South
Franklin, TN 37064
615.599.0906
906studio.com

A Family Legacy Subdivision

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Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

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- ELEVATION DATE: March 14, 2016

MICHAEL A. HATHWAY
REGISTERED ARCHITECT
No. 20001
STATE OF TENNESSEE
3/14/16

BUILDING ELEVATIONS

A3.0

1 NORTH ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'

2 WEST ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'

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Being Parcels 73.00 & 74.01 on Tax Map 53
Franklin, Williamson County, Tennessee

ISSUANCE/REVISION NOTES:

- PLAN DATE: November 11, 2015
- ELEVATION DATE: March 14, 2016

MICHAEL A. HATHWAY
REGISTERED ARCHITECT
No. 20001
STATE OF TENNESSEE
3/14/16

BUILDING ELEVATIONS

A4.0

SHEET 4OF 4

COF no: 6074

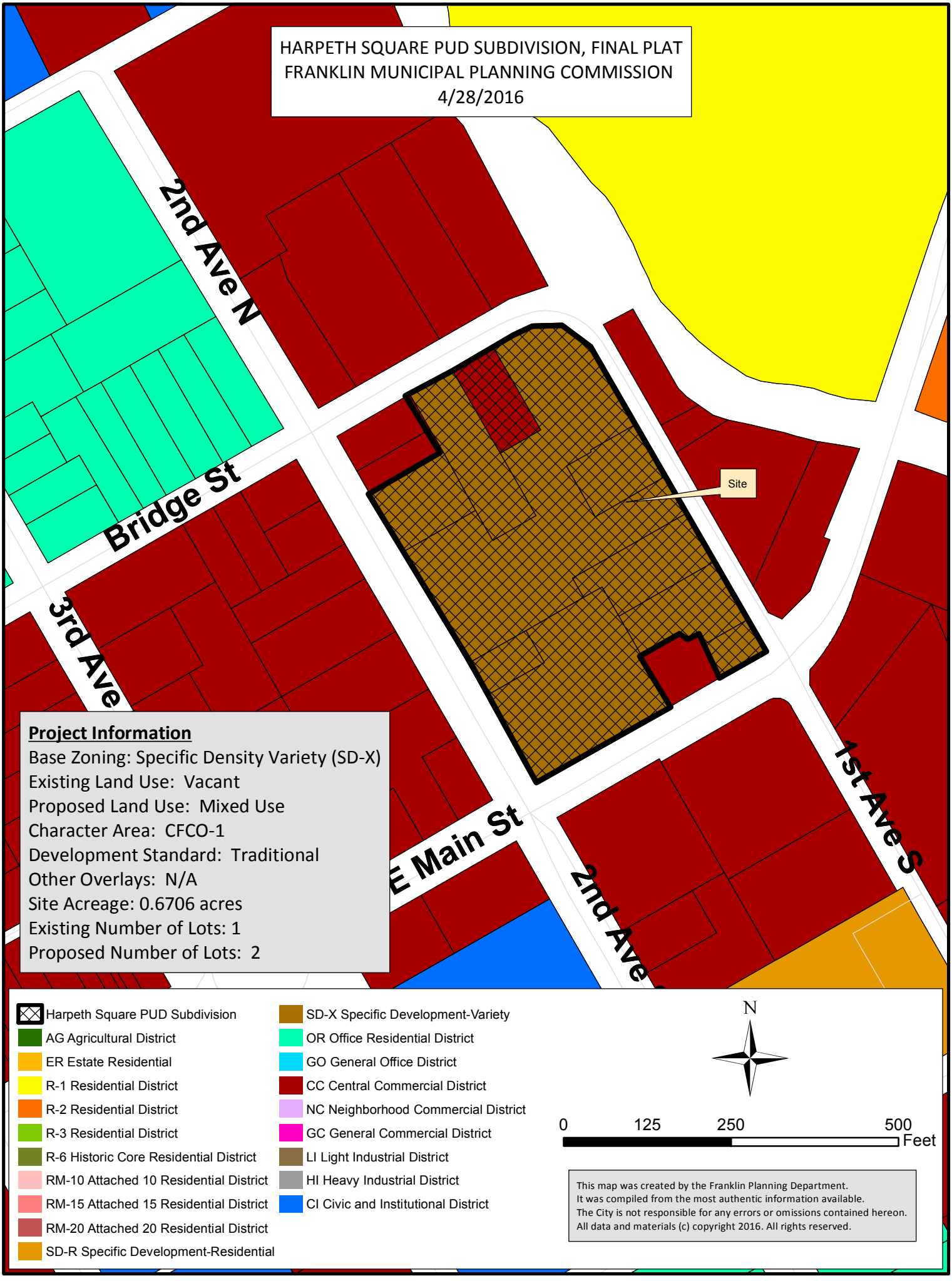
CONDITIONS OF APPROVAL:

Planning

General Comments

1. Final Plat

- Applicant shall be required to file final plats for all sections or lots of this project once site plans are approved for each section. The purpose is to record drainage, utility, and access easements to and within this site.


HARPETH SQUARE PUD SUBDIVISION, FINAL PLAT
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/2016
2nd Ave N
Bridge St
3rd Ave
Site
E Main St
2nd Ave
1st Ave S
Project Information
Base Zoning: Specific Density Variety (SD-X)
Existing Land Use: Vacant
Proposed Land Use: Mixed Use
Character Area: CFCO-1
Development Standard: Traditional
Other Overlays: N/A
Site Acreage: 0.6706 acres
Existing Number of Lots: 1
Proposed Number of Lots: 2
Harpeth Square PUD Subdivision
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
125
250
500
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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GENERAL NOTES:

1) THE PURPOSE OF THIS PLAT IS TO CREATE 2 LOTS TO SUPPORT SECTION ONE OF THE HARPETH SQUARE PUD SUBDIVISION.

2) EXISTING ZONING: SPECIFIC DEVELOPMENT: VARIETY SD-X 33.4 35,000 115

3. MINIMUM REQUIRED SETBACK LINES:
   - YARD FRONTING ANY STREET: 0 FEET
   - SIDE YARD: 0 FEET*
   - REAR YARD: 0 FEET

Character Overlay: Central Franklin
Special Area Classification: CFC01
Applicable Development Standard: Traditional
Applicable Overlay: Historic Preservation (HPO)

4. SUBJECT PROPERTY IS CURRENTLY IDENTIFIED AS PARCELS ____ ON WILLIAMSON COUNTY TAX MAP NO. 78C, GROUP D.

5. THE DEVELOPER ACKNOWLEDGES THAT ALL LOTS HAVE ADEQUATE BUILDING ENVELOPES WITHIN THE REQUIRED SETBACK LINES.

6. OWNER/SUBDIVIDER: Harpeth Associates, LLC
   198 East Main Street
   FRANKLIN, TENNESSEE 37064
   CONTACT: Steve Bacon
   TELEPHONE: (615) 490-4687
   EMAIL: stevebacon@outlook.com

7. SURVEYOR: DIVIDING LINE SURVEY SERVICES
   ADDRESS: 403 S. MULBERRY STREET
   DICKSON, TENNESSEE 37055
   CONTACT: J.R. FAULK
   TELEPHONE: (615) 838-6052
   EMAIL: jrfaulk@dividingline.biz

8. UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION AS INDICATED. TENNESSEE ONE CALL 1-800-351-1111.

9. ALL LOTS TO BE SERVED BY PUBLIC WATER AND SEWER.

10. THIS SURVEYOR HAS NOT PHYSICALLY LOCATED ALL UNDERGROUND UTILITIES. ABOVE GRADE AND UNDERGROUND UTILITIES SHOWN WERE TAKEN FROM VISIBLE APPURTENANCES AT THE SITE, PUBLIC RECORDS, AND/OR MAPS PREPARED BY OTHERS. THIS SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH

11. A PORTION OF THIS PROPERTY LIES IN FLOOD ZONES "AE" & "X" AS SHOWN ON FEMA COMMUNITY PANEL NUMBER 47187C 0211 F, WHICH BEARS AN EFFECTIVE DATE OF SEPTEMBER 28, 2006. FLOOD LINE SHOWN IS A GRAPHIC DEPICTION FROM SAID MAP. THE ACTUAL FIELD RUN TOPOGRAPHIC SURVEY SHOWS THE FLOOD ELEVATION TO RUN CONCURRENT WITH THE EXISTING CONCRETE RETAINING WALL.

12. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.

13. ADEQUATE SPACING AND EASEMENT WIDTHS MUST BE PROVIDED FOR THE PROPOSED UTILITIES PER COF STANDARDS/REGULATIONS.

14. UTILITY AND OTHER PRIVATE EASEMENTS SHOWN MAY BE MODIFIED BY SEPARATE INSTRUMENT WITHOUT RE-RECORDING OF THE FINAL PLAT.

15. COORDINATE SYSTEM U.S. STATE PLANE 1983, ZONE 4100: PROJECT DATUM NAD 1983 (CONUS); VERTICAL DATUM NAVD 88; COMBINED FACTOR = 0.99994977; CONVERGENCE ANGLE = 00°29'47.35".

16. NO BUILDING PERMITS SHALL BE ISSUED FOR PROJECTS IN THIS SECTION UNTIL THE INDIVIDUAL SITE PLAN HAS BEEN APPROVED.

17. THE OWNER/SUBDIVIDER, HARPETH SQUARE ASSOCIATES LLC, ATTESTS THAT NO ONE OTHER THAN THE OWNER HOLDS MINERAL RIGHTS TO THE PROPERTY. NO DOCUMENTATION HAS BEEN FOUND.

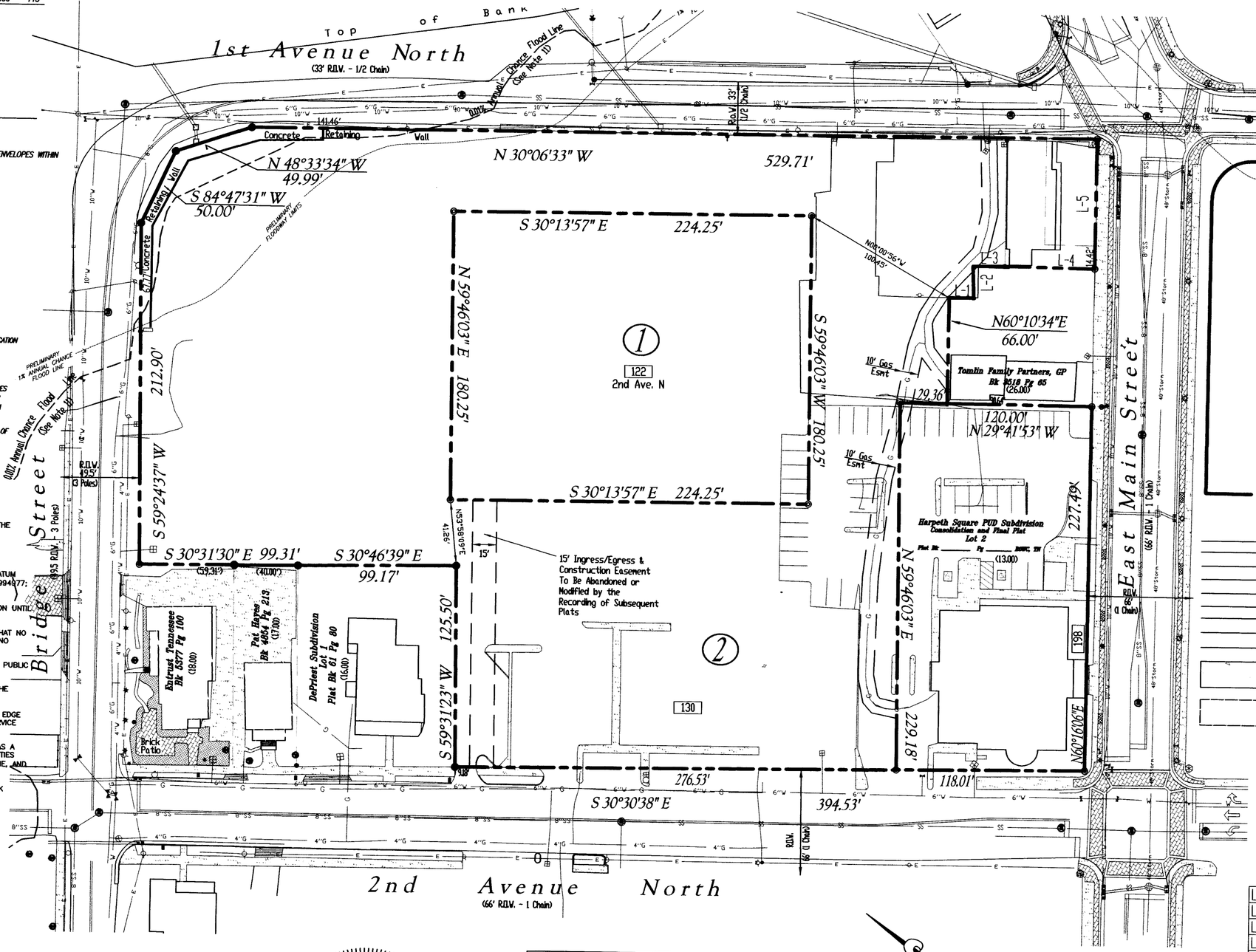
18. NO HVAC UNITS OR OTHER OBSTRUCTIONS SHALL BE PERMITTED WITHIN PUBLIC DRAINAGE EASEMENTS BETWEEN LOTS.

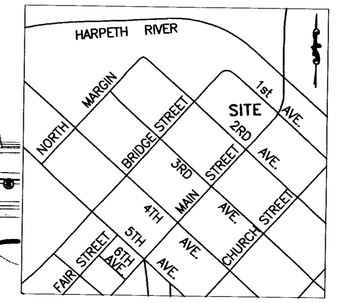
19. MAINTENANCE OF ALL STORMWATER MANAGEMENT FEATURES SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER(S) OR HOA.

20. THE CITY OF FRANKLIN'S SEWER SERVICE RESPONSIBILITY ENDS AT THE EDGE OF PROPERTY LINE. THE HOMEOWNER IS RESPONSIBLE FOR THE SEWER SERVICE FROM ASPHALT TO THE DWELLING.

21. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES (INCLUDING CABLE TELEVISION, ELECTRICAL, NATURAL GAS, SEWER, TELEPHONE, AND WATER LINES) SHALL BE PLACED UNDERGROUND.

22. THIS PLAT VOIDS, VACATES AND SUPERSEDES LOTS 1 & 2 OF PLAT BK ____ PG ____ ROWC, TN.





Vicinity Map
Scale: 1"=1000'

Legend

- Old Iron Rod
- New Iron Rod
- Utility Pole
- Storm Manhole
- Sewer Manhole
- SCI-Single Curb Inlet
- DCI-Double Curb Inlet
- Street Lamp
- 000 Street Number
- Signal Post
- Water Valve
- Water Meter
- Fire Hydrant
- Handicap Parking
- Gas Valve
- 4"G 4"Gas Line
- 6"G 6"Gas Line
- 8"SS 8"Sanitary Sewer
- 10"SS 10"Sanitary Sewer
- 4"W 4"Water Line
- 6"W 6"Water Line
- 10"W 10"Water Line
- Storm Storm Sewer
- E Overhead Utility Lines
- Concrete
- Existing Building

LOT TABLE		
Lot	Acreage	Square Ft
Lot 1	4.04	175,782
Lot 2	0.62	27,171

LINE	BEARING	DISTANCE
L-1	S 30°24'06" E	15.31'
L-2	N 57°58'10" E	20.00'
L-3	N 30°25'15" W	20.00'
L-4	N 29°21'40" W	56.24'
L-5	S 60°16'06" W	81.35'

Tennessee State Plane

0 50 100 150
Scale 1"=50'

Total Area: 4.66 Acres+/-
202,953 SF

CERTIFICATE OF APPROVAL OF WATER SYSTEMS

I hereby certify:

(1) The water systems designated in "Harpeth Square Subdivision" have been installed in accordance with city specifications, or

(2) A performance bond in the amount of $_____ for the for the WATER system has been posted with the City of Franklin, Tennessee, to assure completion of such systems.

City of Franklin Utilities — Date

CERTIFICATE OF APPROVAL OF SUBDIVISION NAME AND STREET NAMES

Subdivision name and street names approved by the Williamson County Emergency Communications.

Williamson County Emergency Communications — Date

J. R. FAULK REGISTERED LAND SURVEYOR TENNESSEE NO. 2122 — 4/7/16

CERTIFICATE OF OWNERSHIP AND DEDICATION

I (we) hereby certify that I am (we are) the owner(s) of the property shown hereon as evidenced in Plat Bk ____ Pg ____ ROWC, TN, and adopt the plan of subdivision of the property as shown hereon and dedicate all public ways and easements as noted. No lot(s) as shown hereon shall again be subdivided, resubdivided, altered or changed so as to produce less area than is hereby established until otherwise approved by the Franklin Municipal Planning Commission, and under no condition shall such lot(s) be made to produce less area than is prescribed by the restrictive covenants as of record in Book ____, Page ____, R.O.W.C., Tennessee running with the title to the property. I (we) further certify that there are no liens on this property, except as follows: Book ____, Page ____, R.O.W.C.

*Owner(s) – Harpeth Associates, LLC — Date

CERTIFICATE OF ACCURACY

I (we) hereby certify that the subdivision plat as shown is correct and that all of the monuments shown hereon have been placed as indicated. The subdivision plat correctly represents as survey made under my supervision on the 12th day of December, 2015. Error of closure is equal to, or greater than, 1:10,000.

Land Surveyor — 4/07/16 Date

Tennessee R.L.S. No. 2122

CERTIFICATE OF APPROVAL OF SEWER SYSTEMS

I hereby certify:

(1) The sewer systems designated in "Harpeth Square Subdivision" have been installed in accordance with city specifications, or

(2) A performance bond in the amount of $_____ for the for the sewer system has been posted with the City of Franklin, Tennessee, to assure completion of such systems.

Supt., Water and Sewer Franklin, Tennessee — Date

CERTIFICATE OF APPROVAL FOR RECORDING

Approved by the Franklin Municipal Planning Commission, Franklin, Williamson County, Tennessee, with the exception of such conditions, if any, as are noted in the planning commission minutes for the ____ day of _____, 20__, and this plat has been approved for recording in the Register's Office of Williamson County.

Secretary, Franklin Municipal Planning Commission — Date

CERTIFICATE OF APPROVAL FOR STREETS & DRAINAGE

I hereby certify that:

(1) The streets and drainage designated in the Harpeth Square Subdivision, have been installed in accordance with City specifications, or

(2) A performance bond in the amount of $_____ for streets and $_____ for drainage has been posted with the City of Franklin, Tennessee, to assure completion of such improvements.

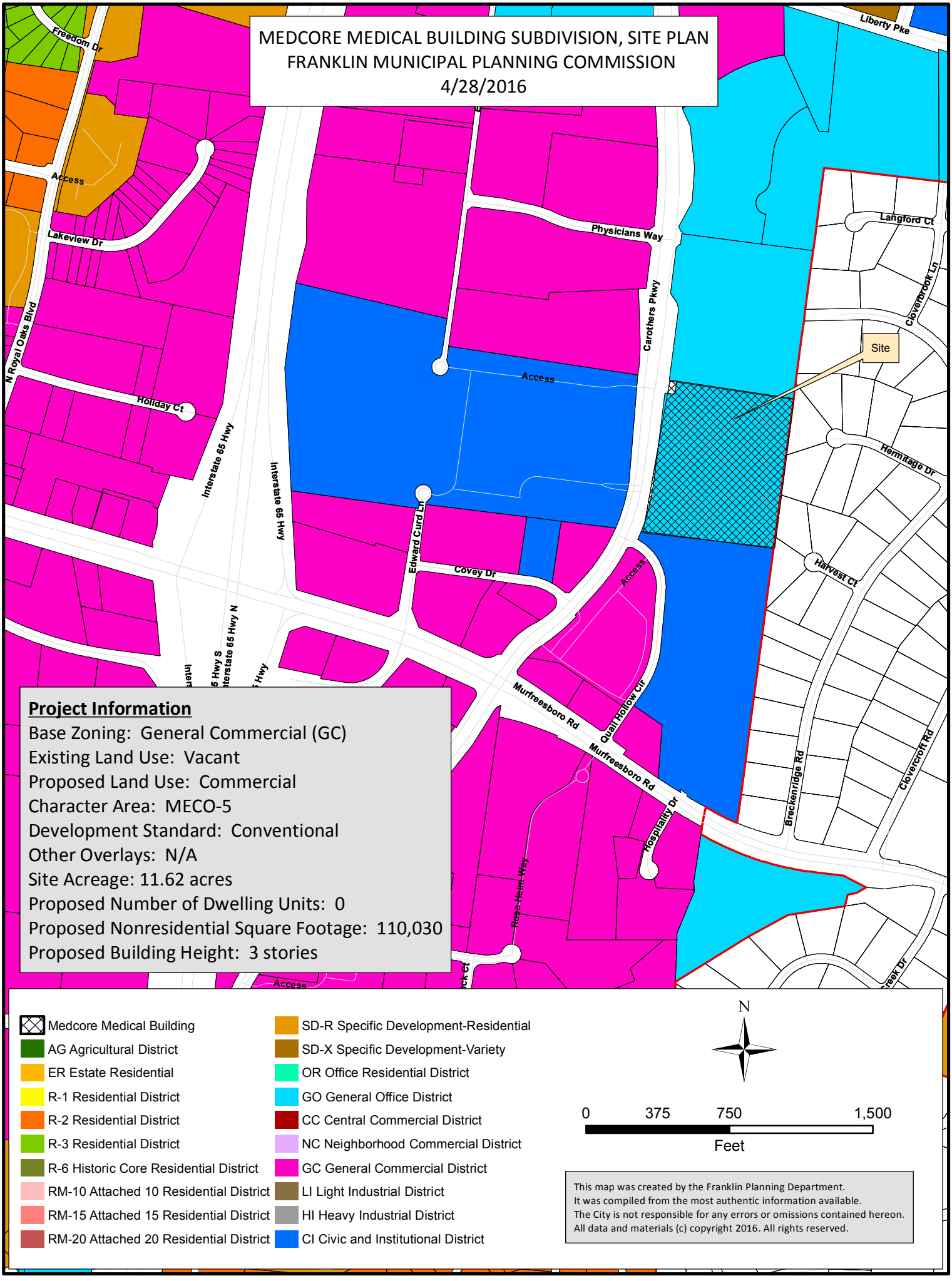
Supt., Streets Franklin, Tennessee — Date

Harpeth Square PUD Subdivision

FINAL PLAT - SECTION 1
FRANKLIN, WILLIAMSON COUNTY, TENNESSEE

Total Acres = 4.66 ac.	Total Lots = 2
Acres New Streets = N/A	Feet New Streets = N/A
Civil District : 9th	Closure Error :1/10,000+
Scale : 1"=50'	Date : 3/14/16 — City Project No. : 6074
Revised: 4/07/16	

Dividing Line Survey Services
Land Surveying
403 S Mulberry Street
Dickson, TN 37055
PHONE (615) 838-6052
www.dividingline.biz


MEDCORE MEDICAL BUILDING SUBDIVISION, SITE PLAN
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/2016
Freedom Dr
Liberty Pke
Access
Lakeview Dr
N Royal Oaks Blvd
Holiday Ct
Interstate 65 Hwy
Physicians Way
Carothers Pkwy
Access
Langford Ct
Cloverbrook Ln
Site
Hermitage Dr
Harvest Ct
Edward Curd Ln
Covey Dr
Access
Murfreesboro Rd
Quail Hollow Cir
Murfreesboro Rd
Hospitality Dr
Rosa Heim Way
Brecken ridge Rd
Clovercroft Rd
Access
Project Information
Base Zoning: General Commercial (GC)
Existing Land Use: Vacant
Proposed Land Use: Commercial
Character Area: MECO-5
Development Standard: Conventional
Other Overlays: N/A
Site Acreage: 11.62 acres
Proposed Number of Dwelling Units: 0
Proposed Nonresidential Square Footage: 110,030
Proposed Building Height: 3 stories
Medcore Medical Building
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
375
750
1,500
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
All data and materials (c) copyright 2016. All rights reserved.

COF no: 6076

CONDITIONS OF APPROVAL:

Engineering - Site Plan Checklist

General Comments

1. J. Stormwater Managment Plan

- Pending outcome of the proposed wetland mitigation for the delineated wetlands that were not shown on the original Site Plan, there may be additional related comments at Resubmittal. Final approval of the Site Plan cannot be given until all permits and issues related to the wetland are settled.

Performance Agreement and Surety

General Comments

2. Engineering Sureties

-

Applicant shall post sureties in the following amounts:

II. City Sewer: $ 69,000
III. City Streets: $ 76,000
IV: Private Streets: $ 241,000
VI. Public Sidewalks: $ 15,000
VII. Stormwater Drainage: $ 124,000
VIII. Green Infrastructure: $ 45,000

3. Landscape

- Landscape Surety $45,000

Planning

General Comments

4. One-Stop Procedure

- Due to the applicant's diligence in addressing staff comments and resolving most issues prior to resubmittal, this project is eligible for the One-Stop Post-PC review process. To participate in the One-Stop Post-PC process, the applicant must submit complete and corrected plans electronically through the IDT online review system by the scheduled One-Stop review date and be present at the One-Stop Center on the scheduled date and time that the One-Stop Post-PC service is available. The intent of One-Stop review is to close all outstanding conditions of approval and gain final document approval in an abbreviated time frame. Plans are reviewed on a first-come, first-serve basis in the One-Stop Center.

- For eligible final plats, the applicant shall bring a mylar with all non-City Hall signatures provided. The applicant will also be required to establish required sureties prior to City Department signatures being applied. The sureties may be established after the one stop process.
- In the case of site plans, the one stop process can only satisfy the City of Franklin review process. The review by State Authority and pre-construction meetings with staff in the field will still be required prior to the issue of stormwater and grading and/or utility construction permits.

If all conditions of approval have not been met at the scheduled One-Stop review, the applicant will be required to submit the project for additional review at another scheduled One-Stop date. The next available One-Stop Post-PC date is **5/4/2016** and the applicant must check in at the One Stop center **between the hours of 8:00 and 11:00 a.m.** in order for their plans to be reviewed that day. The applicant may contact the Department of Building and Neighborhood Services with any questions regarding the process and for any future One-Stop Post-PC dates.

Stormwater

General Comments

5. Diversion Ditch

- If any onsite water is flowing through diversion ditch, water will need to be treated onsite. If not, additional outlet protection may be needed in order to prevent an illicit discharge from offsite water channeled through the unstabilized ditch.

CITY OF FRANKLIN SITE PLAN SUBMITTAL

SCOTT HAMILTON PROTON THERAPY CENTER

MEDCORE MEDICAL BUILDING SUBDIVISION, LOT 3, SITE PLAN, REVISION 1

FRANKLIN, TENNESSEE

MARCH 14, 2016

REVISED APRIL 7, 2016

COF PROJECT #: 6076

SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT: Address:	KIMLEY-HORN & ASSOCIATES 214 OCEANSIDE DRIVE NASHVILLE, TN 37204
Phone:	615-564-2701
Email:	RYAN.MCMASTER@KIMLEY-HORN.COM
Contact Name:	RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
BUILDING SQUARE FOOTAGE:	101,501 SF
PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
MINIMUM LANDSCAPE SURFACE RATIO:	0.30 (2.07 AC PHASE 1)
PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
PARKING PROVIDED:	149 TOTAL SPACES 145 STANDARD SPACES 4 ADA SPACES 0 COMPACT SPACES
EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:

1. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
2. THIS SITE PLAN HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN STANDARDS AND THE APPROVAL OF PLANNING COMMISSION. CHANGES SHALL NOT BE MADE TO THE APPROVED SITE PLAN UNLESS APPROVED BY EITHER RELEVANT DEPARTMENT SUPERINTENDENT OR THE PLANNING COMMISSION.
3. THE INFORMATION SHOWN ON THIS PLAN IS BASED UPON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIPZONE 4100 AND NAD 83 DATUM.
4. BASE INFORMATION WAS TAKEN FROM A TOPOGRAPHIC SURVEY PREPARED BY LITTLEJOHN, DATED MARCH 23, 2015. KIMLEY-HORN AND ASSOCIATES SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF THE BASE INFORMATION SHOWN.
5. THE CONSULTANT HAS FOUND NO EVIDENCE OF THE MINERAL RIGHTS OF THIS PROPERTY BEING TRANSFERRED TO ANY PARTY OTHER THAN THE OWNER.
6. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO BUILDINGS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006

PROJECT BENCHMARK:
CHISELED SQUARE ON BASE OF STONE COLUMN ON THE EASTERN RIGHT-OF-WAY OF CAROTHERS PKWY.
ELEVATION = 735.71

VICINITY MAP
1" = 1000'

PREPARED BY:

Kimley»Horn

214 Oceanside Dr, Nashville, TN 37204
Main: 615.564.2701 | www.kimley-horn.com
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GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

SHEET INDEX	
SHEET NUMBER	SHEET TITLE
C0.0	COVER SHEET
C0.1	GENERAL NOTES
C0.2	CITY OF FRANKLIN NOTES
C1.0	OVERALL EXISTING CONDITIONS
C1.1	ENLARGED EXISTING CONDITIONS
C2.0	OVERALL SITE LAYOUT
C2.1	ENLARGED SITE LAYOUT
C2.2	SITE PLAN DETAILS
C2.3	SITE PLAN DETAILS
C2.4	OFFSITE IMPROVEMENT PLAN
C3.0	OVERALL GRADING AND DRAINAGE PLAN
C3.1	ENLARGED GRADING AND DRAINAGE PLAN
C3.2	INITIAL EPSC – PRE CONSTRUCTION PLAN
C3.3	INTERIM EPSC – CONSTRUCTION PLAN
C3.4	FINAL EPSC – WATER QUALITY PLAN
C3.5	GRADING DRAINAGE AND EPSC DETAILS
C3.6	GRADING DRAINAGE AND EPSC DETAILS
C3.7	GRADING DRAINAGE AND EPSC DETAILS
C4.1	ENLARGED ROW AND ACCESS PLAN
C5.0	OVERALL UTILITY PLAN
C5.1	SITE UTILITY PLAN
C5.2	SITE UTILITY PLAN AND PROFILE – SANITARY SEWER
C5.3	UTILITY DETAILS
L1.0	TREE PRESERVATION PLAN
L2.0	LANDSCAPE PLAN
L3.0	LANDSCAPE DETAILS
A4.1	EXTERIOR ELEVATIONS
A4.2	EXTERIOR ELEVATIONS
ES1.2	SITE PLAN – PHOTOMETRIC

RYAN McMASTER
REGISTERED ENGINEER
No. 109888
STATE OF TENNESSEE
4/7/16

UTILITY AND GOVERNING AGENCIES CONTACT LIST

CITY OF FRANKLIN

109 3rd AVENUE SOUTH, FRANKLIN, TN 37067
CONTACT:
PLANNING CO-LEADER : JOSH KING 615-550-6977
ENGINEERING CO-LEADER : LANCE FITTRO 615-550-6676

WATER

MILCROFTON UTILITY DISTRICT
6333 ARNO RD.
FRANKLIN, TN 37064
PHONE: (615) 794-5947
CONTACT: MIKE JONES

GAS

ATMOS ENERGY
200 NOAH DRIVE
FRANKLIN, TN 37064
PHONE: (615) 794-2596
CONTACT: RON MYATT

TELEPHONE

AT&T
(615) 595-7816
CONTACT: DAVID TUTTEROW

ENGINEER

KIMLEY-HORN AND ASSOCIATES, INC.
214 OCEANSIDE DRIVE
NASHVILLE, TN 37204
PHONE: (615) 564-2876
CONTACT: RYAN McMASTER, P.E.

ELECTRIC

MIDDLE TN ELECTRIC
2156 EDWARD CURD LN.
FRANKLIN, TN 37067
PHONE: (615) 595-4677
CONTACT: DALE HOOD

SANITARY SEWER

CITY OF FRANKLIN
124 LUMBER DRIVE
FRANKLIN, TN 37064
PHONE: (615)550-6855
CONTACT: BEN MCNEIL

CABLE

COMCAST
2501 McGAVOCK PK, SUITE 1206
NASHVILLE, TN 37214
(615)550-6855
CONTACT: WHITNEY SCHRIMSHER

SURVEYOR

LITTLEJOHN
1935 21ST AVENUE SOUTH
NASHVILLE, TN 37212
PHONE: (615) 385-4020
CONTACT: ROBERT SEARSON

Tennessee811
THE CITY OF FRANKLIN WATER MANAGEMENT DEPARTMENT IS NOT A MEMBER OF TN ONE CALL. THE CONTRACTOR SHALL ALSO NOTIFY THE CITY OF FRANKLIN WATER MANAGEMENT DEPARTMENT TO LOCATE WATER AND/OR SEWER AT LEAST 72 HOURS PRIOR TO THE ESTIMATED TIME OF EXCAVATION.

PLAN REVISIONS

REVISION NO.	DATE	REMARKS
1	04/07/16	PER CITY COMMENTS

FILE NUMBER	SHEET NUMBER	TOTAL SHEETS
118133000	C0.0	29

Drawing name: K:\NSH_LDEV\118133000 – Carothers MOB\V4-CADD\3_PlanSheets\C0.0 Cover Sheet – 118133000.dwg C0.0 Cover Sheet Apr 07, 2016 10:16am by: yates.bateman

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

CONTRACTOR RESPONSIBILITIES

1. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR:
   - A. THE CONTRACTOR SHALL VERIFY ALL PROPOSED AND EXISTING CONDITIONS INCLUDING UTILITIES (INVERTS, CONNECTIONS, MATERIALS, ETC.) AND DIMENSIONS WITHIN THE LIMITS OF WORK PRIOR TO THE START OF CONSTRUCTION.
   - B. THE CONTRACTOR IS RESPONSIBLE FOR ALL NOTIFICATIONS AND LIAISONS WITH UTILITY COMPANIES DURING THE PROCESS OF LOCATING, RELOCATING, AND TYING INTO PUBLIC UTILITIES.
   - C. PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY, THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH STAKES, RIBBONS, OR OTHER APPROPRIATE MEANS. THE LOCATION AND EXTENT OF ALL AUTHORIZED LAND DISTURBANCE SHALL OCCUR INSIDE THE APPROVED LIMITS INDICATED ON THE APPROVED PLANS.
2. DURING CONSTRUCTION:
   - A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEVIATIONS FROM THESE PLANS AND SPECIFICATIONS WITHOUT PRIOR WRITTEN CONSENT OF THE ENGINEER MAY CAUSE THE WORK TO BE UNACCEPTABLE.
   - B. THE CONTRACTOR SHALL USE MATERIALS AND EMPLOY CONSTRUCTION METHODS IN ORDER TO COMPLY WITH THE DRAWINGS AND SPECIFICATIONS. WHERE A CONFLICT OCCURS, THE STRICTEST DESIGN SHALL GOVERN. THE ENGINEER'S REVIEW OF SHOP DRAWINGS, PRODUCT DATA, ETC., DOES NOT RELIEVE THE CONTRACTOR FROM COMPLYING WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING OF ANY SPECIFIC DEVIATIONS AND OBTAIN ENGINEER'S WRITTEN APPROVAL OF THE SPECIFIC DEVIATION.
   - C. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION.
   - D. ALL CONSTRUCTION MUST CONFORM TO THE STANDARDS, SPECIFICATIONS, AND CODES OF THE GOVERNING MUNICIPALITIES.
   - E. CONSTRUCTION SHALL MEET ALL STANDARDS SET FORTH IN THE AMERICANS WITH DISABILITIES ACT (VERSION 2010).
   - F. IF THE CONTRACTOR DAMAGES ANY EXISTING UTILITIES DURING CONSTRUCTION, HE SHALL, AT HIS OWN EXPENSE, REPLACE OR REPAIR THE UTILITIES TO ORIGINAL CONDITION AND QUALITY AS APPROVED BY THE OWNER AND REPRESENTATIVE OF THE APPROPRIATE UTILITY COMPANY.
   - G. SUFFICIENT BARRICADES, LIGHTS, SIGNS, AND OTHER TRAFFIC CONTROL METHODS IN ACCORDANCE WITH GOVERNING ORDINANCES MAY BE NECESSARY FOR THE PROTECTION AND SAFETY OF THE PUBLIC. SAID CONTROL DEVICES SHALL BE PER THE MANUAL OF TRAFFIC CONTROL DEVICES, M.U.T.C.D., CURRENT EDITION, AND SHALL BE PROVIDED AND MAINTAINED THROUGHOUT CONSTRUCTION.
   - H. TRAFFIC CONTROLS AND OTHER WARNING DEVICES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY WORK ON CITY, COUNTY, OR TENNESSEE DEPARTMENT OF TRANSPORTATION ROADS. THEY SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION AND SHALL REMAIN IN PLACE UNTIL THE CONCLUSION OF ALL WORK.
   - I. ALL WARNING DEVICES SHALL BE EITHER TYPE I BARRICADES OR DRUMS WITH WARNING LIGHTS ON EVERY OTHER DEVICE. THEY SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), CURRENT EDITION, METRO NASHVILLE STANDARDS FOR COLOR, SIZE, REFLECTIVITY, HEIGHT, AND PLACEMENT.
   - J. FIRE DEPARTMENT ACCESS SHALL BE MAINTAINED AT ALL TIMES.
   - K. CONTRACTOR SHALL SHORE AND BRACE ALL EARTH, FORMS, CONCRETE, STEEL, WOOD, AND MASONRY TO RESIST GRAVITY, EARTH, WIND, THERMAL, CONSTRUCTION, AND MISCELLANEOUS LOADS DURING CONSTRUCTION.
   - L. ON-SITE BURIAL OF DEBRIS IS PROHIBITED.
   - M. UNLESS OTHERWISE NOTED THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL FABRICATED MATERIALS TO THE ENGINEER. DESIGN DOCUMENTS SHALL NOT BE REPRODUCED AS SHOP DRAWINGS.
   - N. IN CASE OF UNFORESEEN CONSTRUCTION COMPLICATIONS OR DISCREPANCIES, THE CONTRACTOR IS TO IMMEDIATELY NOTIFY THE ENGINEER IN WRITING.
   - O. ALL REQUIRED TESTING REPORTS SHALL BE AVAILABLE AT THE JOB SITE.
   - P. AS-BUILT DRAWINGS OF ROADWAYS, STORM DRAINS, SANITARY SEWER AND WATER LINES, FIELD APPROVAL BY THE ENGINEER, AND ALL APPLICABLE BONDS ARE REQUIRED PRIOR TO FINAL ACCEPTANCE BY THE OWNER.
   - Q. CONTRACTOR SHALL MAINTAIN CONTINUOUS UTILITY SERVICE TO ALL EXISTING BUILDINGS THROUGHOUT CONSTRUCTION UNLESS APPROVAL FOR SERVICE INTERRUPTION IS OBTAINED FROM THE OWNERS IN ADVANCE.
   - R. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS TO ENSURE THAT THE NEW WORK SHALL FIT INTO THE EXISTING SITE IN THE MANNER INTENDED AND AS SHOWN ON THE DRAWINGS. SHOULD ANY CONDITIONS EXIST THAT ARE CONTRARY TO THOSE SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE PRIOR TO PERFORMING ANY WORK IN THE AREA INVOLVING DIFFERENCES. NOTIFICATION SHALL BE IN THE FORM OF A DRAWING OR SKETCH INDICATING FIELD MEASUREMENTS AND NOTES RELATING TO THE AREA.
   - S. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO THE PREMISES OR ADJACENT PREMISES, OR INJURIES TO THE PUBLIC DURING THE CONSTRUCTION OF THE WORK, WHETHER CAUSED BY HIMSELF, HIS SUBCONTRACTORS, OR THE CARELESSNESS OF ANY OF HIS EMPLOYEES.
   - T. THE CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN ALL NECESSARY TEMPORARY WORKS FOR THE PROTECTION OF THE WORK AND THE PUBLIC, INCLUDING BARRICADES, WARNING SIGNS, LIGHTS, ETC.
   - U. THE CONTRACTOR IS TO CHECK AND VERIFY ALL MEASUREMENTS, LEVELS, ETC. BEFORE ORDERING MATERIALS AND PROCEEDING WITH THE WORK, AND IS TO BE RESPONSIBLE FOR THE SAME.
   - V. CARE SHALL BE TAKEN TO PROTECT ANY UTILITIES, TREES, ETC. WHICH ARE TO REMAIN AND NOT TO BE DISTURBED BY THE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO SUCH PROPERTY.

GENERAL NOTES:

1. THE PROJECT SITE IS SHOWN ON WILLIAMSON COUNTY, TAX MAP # 79, PARCEL 48.04.
2. BASE INFORMATION WAS TAKEN FROM A SURVEY PREPARED BY LITTLE JOHN, DATED MARCH 23, 2015. KIMLEY-HORN AND ASSOCIATES SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF THE BASE INFORMATION SHOWN.
3. EXISTING PAVEMENT OF PUBLIC ROADWAYS SHALL BE PATCHED IN ACCORDANCE WITH LOCAL AGENCY STANDARDS WHEREVER UTILITY INSTALLATION REQUIRES REMOVAL OF THE EXISTING PAVEMENT.
4. PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING PAVEMENT AND NEW PAVEMENT. SLIGHT FIELD ADJUSTMENT OF FINAL GRADES MAY BE NECESSARY.
5. WHERE NOT SPECIFIED, THE CONTRACTOR WILL BE REQUIRED TO ADJUST GRADES OF INTERSECTING STREETS, ALLEYS, PUBLIC ENTRANCES AND PRIVATE DRIVES IN ORDER TO ASSURE POSITIVE DRAINAGE TO STORM INLETS.
6. ALL DIMENSIONS ARE TO FACE OF CURB AND/OR EXTERIOR FACE OF BUILDING UNLESS OTHERWISE NOTED.
7. CONCRETE FOR CURBS AND SIDEWALKS SHALL BE 3500 PSI MIN. CONCRETE.
8. ACCESSIBLE RAMPS SHALL HAVE A MAXIMUM SLOPE OF 8.33%. SLOPES WITHIN ACCESSIBLE SPACES SHALL BE MAXIMUM 2% IN ALL DIRECTIONS.
9. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT PROVISIONS OF THE MANUAL OF ACCIDENT PREVENTION AND CONSTRUCTION ISSUED BY AGC OF AMERICA, INC. AND THE SAFETY AND HEALTH REGULATIONS OF CONSTRUCTION ISSUED BY THE U.S. DEPARTMENT OF LABOR.
10. ALL ROADWAY AND SIDEWALK CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS AND SPECIFICATIONS OF THE LOCAL MUNICIPALITY.
11. ALL CONSTRUCTION MATERIALS AND INSTALLATION SHALL CONFORM TO THE LOCAL MUNICIPALITY AND STATE DOT REGULATIONS AND SPECIFICATIONS.
12. THE CONTRACTOR SHALL PAVE AND COLD PLANE IN THE DIRECTION OF TRAFFIC.
13. ANY WORK UNACCEPTABLE TO THE OWNER'S REPRESENTATIVE OR TO THE LOCAL GOVERNING AUTHORITY SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.

DEMOLITION INFORMATION:

1. NOTIFICATIONS:

   THE CONTRACTOR SHALL NOTIFY THE OWNER AND CITY INSPECTOR(S) 24 HOURS PRIOR TO ANY DEMOLITION OR CONSTRUCTION.
2. DISPOSAL GUIDELINES:
   - A. ONLY ITEMS SPECIFICALLY NOTED TO BE DEMOLISHED SHALL BE REMOVED FROM THE SITE.
   - B. REMOVE EXISTING PAVED AREAS AS SHOWN INCLUDING DRIVEWAYS, SIDEWALKS, PARKING AREAS, SERVICE AREAS, EQUIPMENT PADS, AND ALL MISCELLANEOUS PAVING.
   - C. ALL DEBRIS RESULTING FROM DEMOLITION SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY BY THE CONTRACTOR IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS. BACKFILL ALL TRENCHES AND EXCAVATIONS RESULTING FROM DEMOLITION.
   - D. ALL DEMOLISHED MATERIAL BECOMES THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE NOTED.
3. TREE PROTECTION GUIDELINES:

   PROTECT ALL EXISTING TREES NOTED "TO REMAIN" AND ALL ITEMS TO BE TURNED OVER TO THE OWNER DURING DEMOLITION. TAKE ALL NECESSARY PRECAUTIONS AND PROTECTIVE MEASURES. ANY EXISTING ITEMS TO BE TURNED OVER TO THE OWNER WHICH ARE DAMAGED DURING DEMOLITION SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER. TREES WHICH ARE DAMAGED WILL BE REPLACED OR REIMBURSED AT A RATE TO BE DETERMINED BY THE OWNER.
4. UTILITIES:
   - A. PRIOR TO REMOVING OR ABANDONING ANY UTILITY THE CONTRACTOR SHALL VERIFY THAT NO UPSTREAM SERVICE WILL BE TERMINATED. THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING OF ANY TERMINATION NOT SHOWN ON THE PLANS.
   - B. ALL ABANDONED WATER LINES, STORM SEWER PIPE, SANITARY SEWER PIPES, GAS LINES, OR ANY OTHER ABANDONED UNDERGROUND UTILITY SHALL BE ABANDONED IN PLACE UNLESS NOTED OTHERWISE.

SITE GRADING:

1. THE DISTURBED AREA FOR THIS PROJECT IS APPROXIMATELY 9.02 ACRES.
2. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO PROPOSED RESIDENTIAL UNITS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006.
3. TOPSOIL SHALL BE STORED ON SITE IN LOCATIONS APPROVED BY THE OWNER'S REPRESENTATIVE. DRAINAGE SHALL ROUTE AROUND THESE TOPSOIL STOCKPILES FOR THE DURATION OF THE GRADING OPERATIONS. EROSION CONTROL MEASURES SHALL BE UTILIZED TO PREVENT LOSS OF TOPSOIL MATERIAL.
2. UNSUITABLE SOILS SHALL BE REMOVED FROM THE SITE AT NO ADDITIONAL COST TO THE OWNER.
3. FILL AREA SHALL BE PROOF-ROLLED UNDER THE DIRECTION OF A QUALIFIED SOILS ENGINEER WITH RUBBER-TIRED EQUIPMENT WITH A MINIMUM WEIGHT OF FIFTEEN TONS PRIOR TO BEGINNING FILL OPERATION. AREAS WHICH ARE SOFT OR UNSTABLE SHALL BE UNDERCUT UNTIL STABLE SOILS ARE FOUND.
4. CUT AREA SHALL BE PROOF-ROLLED AFTER FINAL SUBGRADE IS ACHIEVED IN THE SAME MANNER AS FILLED AREAS. SOFT OR UNSTABLE SOILS SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 12".
5. ALL FILL AREAS SHALL BE RAISED IN LIFTS NOT EXCEEDING 6 INCHES. UNLESS OTHERWISE APPROVED BY QUALIFIED SOIL ENGINEER TO OBTAIN REQUIRED COMPACTION.
6. ALL GRADING SHALL BE COMPLETED TO THE LEVEL INDICATED BY THE SCOPE OF WORK LISTED IN THE BID DOCUMENTS.
7. ALL AREAS SHALL BE GRADED TO PROVIDE PROPER DRAINAGE AND PREVENT STANDING WATER.
8. ELEVATIONS SHOWN ON THE PLANS ARE THE FINISH GRADE ELEVATIONS.
9. ALL BACKFILL BEHIND WALLS SHALL BE INSTALLED PER WALL MANUFACTURER'S INSTALLATION SPECIFICATIONS OR AS NOTED ON PLANS, WHICHEVER IS MORE RESTRICTIVE.
10. CONTRACTOR SHALL REFER TO SITE SPECIFIC GEOTECHNICAL REPORT AND SITE SPECIFIC STORM WATER POLLUTION PREVENTION PLAN (SWPPP) PRIOR TO COMMENCING WITH EARTHWORK ACTIVITIES.
11. PERMANENT CUT AND FILL SLOPES SHALL NOT EXCEED 3:1 UNLESS OTHERWISE NOTED.
12. THE PROPOSED GRADING PLAN IS A RESULT OF AN ENGINEERED DESIGN AND REFLECT A PLANNED INTENT WITH REGARD TO SLOPES AND STORM RUNOFF. SHOULD THE CONTRACTOR HAVE QUESTIONS OR COMMENTS RELATED TO THE PROPOSED DESIGN, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
13. THE CONTRACTOR SHALL NOTIFY "ONE CALL" (811) AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. THE CITY OF FRANKLIN WATER MANAGEMENT DEPARTMENT IS NOT A MEMBER OF TN ONE CALL. THE CONTRACTOR SHALL ALSO NOTIFY THE CITY OF FRANKLIN WATER MANAGEMENT DEPARTMENT TO LOCATE WATER AND/OR SEWER AT LEAST 72 HOURS PRIOR TO THE ESTIMATED TIME OF EXCAVATION.
14. EARTHWORK ACTIVITIES MUST BE SUPERVISED BY A LICENSED GEOTECHNICAL ENGINEER.
15. THE CONTRACTOR SHALL PROVIDE AS-BUILT CONDITIONS OF ALL UTILITIES AND STORMWATER PONDS PER THE LOCAL MUNICIPALITY REGULATIONS. AS-BUILT CONDITIONS MUST BE LOCATED BY A LICENSED LAND SURVEYOR.

EROSION AND SEDIMENT CONTROL INFORMATION:

1. COMPREHENSIVE:
   - A. THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO OR CONCURRENT WITH LAND-DISTURBING ACTIVITIES.
   - B. PROVISIONS TO PREVENT EROSION OF SOIL FROM THE SITE SHALL BE AT A MINIMUM IN CONFORMANCE WITH THE REQUIREMENTS OF THE TENNESSEE EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.
   - C. FAILURE TO INSTALL, OPERATE, OR MAINTAIN ALL EROSION CONTROL MEASURES WILL RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB SITE UNTIL SUCH MEASURES ARE CORRECTED BACK TO THE STANDARDS SPECIFIED IN THE TENNESSEE EROSION AND SEDIMENT CONTROL HANDBOOKS, CURRENT EDITION.
   - D. EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO LAND DISTURBANCE. THE LOCATION OF SOME OF THE EROSION CONTROL DEVICES MAY HAVE TO BE ALTERED FROM THAT SHOWN ON THE APPROVED PLANS IF DRAINAGE PATTERNS DURING CONSTRUCTION ARE DIFFERENT FROM THE FINAL PROPOSED DRAINAGE PATTERNS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES DURING CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
   - E. THE CONSTRUCTION OF THE SITE WILL COMMENCE WITH THE INSTALLATION OF EROSION CONTROL MEASURES SUFFICIENT TO CONTROL SEDIMENT DEPOSITS AND EROSION. ALL SEDIMENT CONTROL WILL BE MAINTAINED UNTIL ALL UPSTREAM GROUND WITHIN THE CONSTRUCTION AREA HAS BEEN COMPLETELY STABILIZED WITH PERMANENT VEGETATION AND ALL ROADS/DRIVEWAYS HAVE BEEN PAVED.
   - F. CONSTRUCTION EXITS SHALL BE CONSTRUCTED AT EACH POINT OF ENTRY OR EXIT FROM THE SITE AND SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH STONE AS CONDITIONS DEMAND, REPAIR, AND/OR CLEANOUT OF ANY STRUCTURES USED TO TRAP SEDIMENT. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES OFF SITE ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. ACCESS POINTS PROTECTED WITH A CONSTRUCTION EXIT SHALL BE OTHERWISE BARRICADED UNTIL THE SITE IS STABILIZED.
   - G. EROSION CONTROL DEVICES ARE TO BE INSTALLED AND FULLY OPERATIONAL PRIOR TO ANY DEMOLITION.
   - H. SILT FENCE SHALL BE TYPE C TEMPORARY SILT FENCE AND BE WIRE ENFORCED, UNLESS OTHERWISE NOTED.
   - I. ADDITIONAL EROSION CONTROL MEASURES WILL BE EMPLOYED WHERE DETERMINED NECESSARY BY ACTUAL SITE CONDITIONS.
2. DURING CONSTRUCTION:
   - A. ON-SITE DUST CONTROL DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL LOCAL CODES AND REGULATIONS.
   - B. THE CONTRACTOR SHALL REMOVE ACCUMULATED SILT WHEN THE SILT HAS ACCUMULATED TO ½ THE ORIGINAL HEIGHT OF THE BARRIER.
   - C. ALL OPEN SWALES MUST BE GRASSED AND RIP-RAP MUST BE PLACED AS REQUIRED TO CONTROL EROSION. STONE FOR RIP-RAP SHALL CONSIST OF ROUGH UN-HEWN QUARRY GRANITE AS NEARLY IN RECTANGULAR SECTION AS PRACTICAL. THE MINIMUM SIZE STONE SHALL WEIGH BETWEEN 75 AND 150 POUNDS AND SHALL BE HAND PLACED AS A LOOSE STONE EMBANKMENT.
   - D. AT ANY TIME DURING CONSTRUCTION IF IT BECOMES NECESSARY TO PUMP STORM WATER OR GROUNDWATER FROM AN EXCAVATION, THE PUMPED WATER MUST NOT HAVE AN OBJECTIONABLE COLOR CONTRAST WHEN COMPARED TO THE RECEIVING WATERS AND MUST NOT IMPAIR IN ANY WAY THE RECEIVING WATERS. WATER THAT DOES NOT MEET THESE REQUIREMENTS MUST BE FILTERED OR DISCHARGED INTO A TEMPORARY SEDIMENT BASIN, WEIR TANK, DEWATERING TANK, GRAVITY BAG FILTER, SAND MEDIA FILTER, OR OTHER APPROVED DEVICE UNTIL IT MEETS THE EFFLUENT REQUIREMENTS. ONCE THE EFFLUENT REQUIREMENTS HAVE BEEN MET THE WATER MAY BE DISCHARGED INTO THE STORM SEWER SYSTEM.

     THESE SAME REQUIREMENTS APPLY TO ALL AUTHORIZED NON-STORM WATER DISCHARGES UNDER THE STATE OF TENNESSEE GENERAL NPDES PERMIT NO. TNR 100000, AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY.
   - E. NO GRADED SLOPE SHALL EXCEED 3H:1V UNLESS OTHERWISE NOTED.
   - F. EPSC MEASURES SHALL ONLY BE REMOVED AFTER THE SITE HAS ESTABLISHED A SOLID, STABILIZED STAND OF GRASS.

STORM DRAINAGE INFORMATION:

1. PIPES:
   - A. UNLESS OTHERWISE NOTED ON THE DRAWING RCP SHALL BE CLASS III WITH "O" RING JOINTS.
   - B. THE PIPE MANUFACTURER SHALL SUPPLY A CLASSIFICATION OF THE PIPE SPECIFICATIONS FOR EACH PIPE PRIOR TO INSTALLATION.
   - C. PIPE INSTALLATION SHALL CONFORM TO THE LOCAL MUNICIPALITY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.
   - D. IF UNDERGROUND WATER/SPRINGS ARE UNCOVERED DURING CONSTRUCTION, PERMANENT FRENCH DRAINS MAY BE REQUIRED. CONSULTATION WITH THE ONSITE GEOTECHNICAL ENGINEER WILL BE REQUIRED.
2. STRUCTURES:
   - A. ALL STRUCTURES SHALL BE MADE OF PRECAST CONCRETE. ALL INVERTS SHALL BE NEATLY FORMED UP TO THE SPRING LINE WITH MORTAR OR BRICK TO INSURE PROPER FLOW.
   - B. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL INVERTS AND PIPE SLOPES PRIOR TO INSTALLATION TO ENSURE PROPER COVER AND LENGTHS OF PIPE.
   - C. CONTRACTOR SHALL REMOVE SEDIMENT FROM ALL STORM STRUCTURES PRIOR TO ACCEPTANCE BY LOCAL MUNICIPALITY.
   - D. THE CONTRACTOR SHALL COMPACT FILL SUFFICIENTLY AROUND ALL STRUCTURES, PIPES, ETC. WITHIN PROPOSED PAVEMENT TO AVOID SETTLEMENT. ANY SETTLEMENT DURING THE WARRANTY/MAINTENANCE PERIOD SHALL BE RESTORED AT THE CONTRACTORS EXPENSE.

SANITARY SEWER NOTES:

1. CONSTRUCTION CRITERIA:
   - A. ALL INSTALLATION, MATERIALS, AND SPECIFICATIONS SHALL BE IN ACCORDANCE WITH THE LOCAL MUNICIPALITY STANDARD SPECIFICATIONS.
   - B. ALL WASTEWATER EASEMENTS MUST BE DRESSED AND GRASSED TO CONTROL EROSION AND SEDIMENTATION IN ACCORDANCE WITH REGULATIONS PRIOR TO ACCEPTANCE. TREES SHALL NOT BE PLANTED IN THE PERMANENT EASEMENT AREA.
   - C. THE BACKFILL OF ALL TRENCHES SHALL BE COMPACTED TO 98% OF THE THEORETICAL MAXIMUM DENSITY. BACKFILL MATERIAL SHALL BE FREE OF ROOTS, STUMPS, OR OTHER FOREIGN DEBRIS AND SHALL BE PLACED AT OR NEAR OPTIMUM MOISTURE. CORRECTION OF ANY TRENCH SETTLEMENT WITHIN A YEAR FROM THE DATE OF APPROVAL WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
   - D. THE CONTRACTOR FOR VERTICAL CONSTRUCTION SHALL VERIFY THE ELEVATION OF THE SANITARY SEWER SERVICE VS. FINISH FLOOR ELEVATION FOR EACH BUILDING AND ADJUST THE PROPOSED FINISH FLOOR ELEVATION AS NECESSARY IN ORDER TO ASSURE PROPER SEWER SERVICE.
   - E. PROPOSED LOT CORNERS SHALL BE STAKED IN THE FIELD PRIOR TO UTILITY SERVICE INSTALLATION.
1. PIPES:
   - A. THE MINIMUM VERTICAL DISTANCE BETWEEN WATER AND SEWER LINES SHALL BE 18 INCHES. THE MINIMUM HORIZONTAL DISTANCE BETWEEN WATER AND SEWER LINES SHALL BE 10 FEET WHERE PRACTICAL.
   - B. LOW PRESSURE AIR TESTING IS REQUIRED FOR ALL WASTEWATER PIPE SYSTEMS. THIS TEST MUST MEET ALL REQUIREMENTS AS OUTLINED IN ASTM C-828-80 OR CURRENT REVISION.
   - C. WHERE A SEWER LINE CROSSES UNDER A WATER MAIN, THE TOP OF THE SEWER LINE SHALL BE AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER MAIN. IF PROPER SEPARATION CANNOT BE PROVIDED, CONSTRUCT THE WATER CROSSING WITH MECHANICAL JOINT DIP FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE SEWER LINE.
   - D. ALL SEWER SERVICES SHALL BE 6 INCHES IN DIAMETER AND EXTEND TO THE PROPERTY LINE.
   - E. CONTRACTOR SHALL PROVIDE #8 WIRE WITH ALL SEWER SERVICES.
3. STRUCTURES:
   - A. CONTRACTOR SHALL FIELD VERIFY LOCATION AND INVERT ELEVATIONS OF WASTEWATER PIPE FOR CONNECTION TO EXISTING WASTEWATER SYSTEMS PRIOR TO STARTING UTILITY WORK.
   - B. EXISTING MANHOLES LOCATED WITHIN PROPOSED CUT/FILL AREAS SHALL BE ADJUSTED TO ASSURE THAT THE TOP OF GRATE MATCHED PROPOSED FINISH GRADE.
   - C. THE OUTSIDE OF ALL MANHOLES SHALL BE COATED WITH BITUMINOUS PAINT.
   - D. ALL CONNECTIONS TO EXISTING MANHOLES SHALL BE BY CORING AND RESILIENT SEAL METHOD.

WATER SYSTEM INFORMATION:

1. NOTIFICATIONS:
   - A. NOTIFY LOCAL MUNICIPALITY AND UTILITY DISTRICT PRIOR TO THE START OF CONSTRUCTION AND THE WATER AND SEWER INSPECTOR FOR WORK WITHIN THE PUBLIC RIGHT-OF-WAY AND ANY METER WORK.
   - B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING THE SEQUENCING OF CONSTRUCTION FOR ALL UTILITIES SO THAT WATER MAINS DO NOT CONFLICT WITH OTHER UTILITIES.
   - C. THE CONTRACTOR SHALL PROVIDE ALL HORIZONTAL BENDS IN ORDER TO PROVIDE THE ALIGNMENT SHOWN ON THE PLANS. VERTICAL BENDS SHALL BE PROVIDED IN ORDER TO PASS UNDER/OVER OTHER UTILITY LINES, PROVIDING MINIMUM COVER AS SPECIFIED BY THE LOCAL MUNICIPALITY. PROVIDE BRACING AND SUPPORT AS REQUIRED BY THE LOCAL MUNICIPALITY.
2. HYDRANTS:
   - A. FOR FIRE HYDRANT INSTALLATION REFER TO DETAILS.
3. PIPES:
   - A. EXISTING DOMESTIC WATER LINES ARE TO BE ABANDONED IN PLACE UNLESS NOTED OTHERWISE.
   - B. ALL INSTALLATION, MATERIAL, DISINFECTION, AND INSPECTIONS SHALL BE IN ACCORDANCE WITH THE LOCAL MUNICIPALITY STANDARD SPECIFICATIONS.
   - C. PROVIDE A MINIMUM OF 36 INCHES OF COVER OVER ALL WATER MAINS.
4. WATER MAIN INSTALLATION:
   - A. ALL WATER AND SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH SPECIFICATIONS AND STANDARD DETAILS OF THE LOCAL MUNICIPALITY.
   - B. THE CONTRACTOR SHALL ADJUST THE ALIGNMENT OF THE WATER MAIN, AS NECESSARY, IN ORDER TO PROVIDE PROPER SEPARATION OF UTILITIES AND ALLOW SPACING NECESSARY FOR BRACING AT BENDS AND TEES.

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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

RYAN McMASTER
REGISTERED
LANDSCAPE
ARCHITECT
No. 109925
STATE OF TENNESSEE
4/9/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	RJA
DRAWN BY:	RJA
CHECKED BY:	RLM
DATE:	03/14/2016

KHA PROJECT NO. 118133000

GENERAL NOTES

SHEET NUMBER
C0.1

CD#= 6870

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STORMWATER EROSION PREVENTION AND SEDIMENT CONTROL REQUIREMENTS:

• EROSION AND SEDIMENT CONTROL MEASURES SHALL BE DESIGNED TO CONTROL THE RAINFALL AND RUNOFF FROM A 5 YEAR, 24 HOUR STORM, AS A MINIMUM.
• EROSION PREVENTION AND SEDIMENT CONTROLS MUST BE INSPECTED ONCEA WEEK AND 24 HOURS BEFORE A RAIN EVENT AFTER A.25 INCH RAIN EVENT AND DOCUMENTED ON THE INSPECTION SITE CHECKLIST.
• SEDIMENT THAT HAS ESCAPED THE CONSTRUCTION SITE AND HAS COLLECTED IN THE STREET OR DRAINAGE STRUCTURES MUST IMMEDIATELY BE PHYSICALLY REMOVED.
• STABILIZATION MEASURES MUST BE PERFORMED WITHIN SEVEN (7) DAYS IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, AND WITHIN FIFTEEN (15) DAYS AFTER FINAL GRADING. THIS IS A COVER CROP WITH AT LEAST 75% COVERAGE.
• DURING NON-GERMINATING PERIODS, MULCH MUST BEAPPLIED AT THE SPECIFIED RATES.

TEMPORARY STABILIZATION & PERMANENT STABILIZATION

• STRAW MULCH MUST BE APPLIED AT 3.0 TONS PER ACRE.
• STRAW MULCH WITH MULCH CONTROL NETTING OR EROSION CONTROL BLANKETS MUST BE INSTALLED ON ALL SLOPES 3:1 AND STEEPER."
• STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.
• EXCAVATED TOPSOIL TO BE REUSED MUST BE STOCKPILED AND ENCIRCLED WITH SILT FENCING. STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER. STOCKPILES WHICH HAVE NOT BEEN USED FOR 14 CALENDAR DAYS SHALL BE STABILIZED THROUGH THE APPLICATION OF SOD, SEED AND ANCHORED STRAW MULCH, OR OTHER APPROVED STABILIZATION MEASURES.
• OFF-SITE SPOIL OR BORROW AREAS MUST HAVE APPROVED SEDIMENT CONTROL PLANS.
• A 25 FOOT UNDISTURBED STREAMSIDE BUFFER ZONE WILL BE LEFT FROM TOP OFBANK ON BOTH SIDES FOR THE ENTIRE LENGTH OF STREAMS THAT TDEC DETERMINES TO BE A PERENNIAL OR INTERMITTENT STREAM. THE STREAMSIDE BUFFER SHALL BE FENCED OFF WHERE THERE IS NO ENCROACHMENT. BUFFER MEANS A VEGETATED AREA, INCLUDING TREES AND SHRUBS THAT EXISTS OR IS ESTABLISHED TO PROTECT A STREAM SYSTEM, LAKE, OR RESERVOIR AREA. THIS BUFFER ALSO APPLIES TO OTHER SENSITIVE AREAS SUCH AS SPRINGS, WETLANDS AND SINKHOLES. TDEC REQUIRES A 60 FOOT CONSTRUCTION BUFFER ON SOME STREAMS.
• AN ORANGE CONSTRUCTION FENCE IS REQUIRED TO DESIGNATE THE BUFFER AREA BEFORE CLEARING OR TREE REMOVAL HAS BEGUN.
• THIS STREAMSIDE BUFFER WILL BE LEFT IN UNDISTURBED OR ENHANCED (WHEN REQUIRED BY THE CITY) AND WILL BE PART OF OPEN SPACE AND RECOGNIZED ON COVENANTS WITH RESTRICTIONS OF HOW IT IS TO BE MAINTAINED BY HOMEOWNER ASSOCIATION OR NONRESIDENTIAL PROPERTY OWNER. IF MORE THAN REGULAR MAINTENANCE IS EVER NEEDED, I.E. REMOVAL OF SMALL BRUSH OR TREES THAT HAVE FALLEN, A LANDSCAPE PLAN AND A TREE CUTTING PERMIT IS REQUIRED.
• ALL SEDIMENT BASINS, TRAP EMBANKMENTS, SWALES, PERIMETER DIKES, AND PERMANENT SLOPES STEEPER OR EQUAL TO 3:1 SHALL BE STABILIZED WITH SOD, SEED AND ANCHORED STRAW MULCH OR OTHER APPROVED STABILIZATION MEASURES, WITHIN SEVEN (7) CALENDAR DAYS OF ESTABLISHMENT. ALL AREAS DISTURBED OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM MUST BE MINIMIZED AND STABILIZED IMMEDIATELY. MAINTENANCE MUST BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION. RESTABILIZATION OR OVERSEEDING WILL BE REQUIRED, IF NECESSARY.
• IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
• CONSTRUCT AND STABILIZE SEDIMENT POND AND CONVEYANCES FIRST. STABILIZE MEANS:

A.) A UNIFORM (E. G., EVENLY DISTRIBUTED, WITHOUT LARGE BARE AREAS) PERENNIAL VEGETATIVE COVER WITH A DENSITY OF A MINIMUM OF 75 PERCENT OF THE NATIVE BACKGROUND VEGETATIVE COVER FOR THE AREA ESTABLISHED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY PERMANENT STRUCTURES, OR

B.) EQUIVALENT PERMANENT STABILIZATION MEASURES (SUCH AS THE USE OF RIPRAP, GABIONS, OR GEOTEXTILE) HAVE BEEN EMPLOYED WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.
• IF THERE IS A GRAVEL ENVELOPE IN FRONT OF THE OUTLET ORIFICE, IT WILL BE REMOVED AS SOON AS THE SITE IS STABILIZED AND BEFORE BONDS ARE RELEASED.
• INCLUDE A FOREBAY IN ANY DETENTION POND TO FACILITATEEASIER MAINTENANCE.
• WITH EARTHEN WALLS, PLACE AN ANTISEEP COLLAR (OR COLLARS) AROUND THE OUTLET PIPE.

SEDIMENT FENCE

SEDIMENT FENCES OR OTHER SEDIMENT BARRIERS, HAS BEEN INSTALLED PROPERLY ALONG TOPOGRAPHICAL CONTOURS DOWNSLOPE OF THE AREA TO BE DISTURBED PRIOR TO ANY GRADING, CLEARING AND/OR ANY OTHER CONSTRUCTION ACTIVITY.
SEDIMENT FENCES:
USE PRINCIPALLY IN AREAS WHERE SHEET FLOW OCCURS.
INSTALL ALONG A LEVEL CONTOUR, SO WATER DOES NOT POND MORE THAN 1.5 FEET (0.5 M) AT ANY POINT. THE MAXIMUM SLOPE PERPENDICULAR TO THE FENCE LINE SHOULD BE 1:1. NO MORE THAN 0.25 ACRE (0.1 HA) PER 100 FT. (31.4 M), OR 0.5 CFS (1.4 X 10-2 M3/S) OF CONCENTRATED FLOW SHOULD DRAIN TO ANY POINT ALONG THE SILT FENCE.
TURN ENDS OF FENCE UPHILL TO PREVENT SCOUR FROM WASH AROUND. INTERMITTENTLY, TURN FENCE UPHILL.
PROVIDE AREA BEHIND THE FENCE FOR RUNOFF TO POND AND SEDIMENT TO SETTLE (APPROX. 1200 SQ. FT. (111.5 M2) PER ACRE (0.4 HA) DRAINING TO THE SILT FENCE).
SELECT FILTER FABRIC THAT RETAINS 85% OF THE SOIL, BY WEIGHT, BASED ON SIEVE ANALYSIS, BUT IS NOT FINER THAN AN EQUIVALENT OPENING SIZE OF 70.

• STRAW/HAY BALES (ARE NOT RECOMMENDED) SILT FENCES, SAND BAG BARRIERS, AND ROCK FILTERS (ESPECIALLY CONTINUOUS BERMS) ARE PREFERRED OVER STRAW/HAY BALES BECAUSE SEDIMENT REMOVAL EFFICIENCIES, DURABILITY, AND MAINTENANCE REQUIREMENTS ARE FAR LESS DESIRABLE IN STRAW/HAY BALES.

• INLET PROTECTION: WHERE APPLICABLE, INLET PROTECTIONS FOR NEARBY STORM SEWER CURB AND DROP INLETS HAVE BEEN INSTALLED.

• IDENTIFY STORM DRAIN PROTECTION: WHERE APPLICABLE, PROTECTIONS FOR NEARBY STORM SEWER CURB AND DROP INLETS HAVE BEEN INSTALLED.

SAND BAG BARRIER: USED TO CREATE A SMALL SEDIMENT TRAP UPSTREAM OF INLETS ON SLOPED, PAVED STREETS.

EXCAVATED DROP INLET SEDIMENT TRAP: AN EXCAVATED AREA AROUND THE INLET TO TRAP.

GUTTERBUDDY TYPE PROTECTION: USED TO CREATE A SMALL WATER PONDING AREA TO SETTLE SEDIMENT OUT BEFORE WATER ENTERS STORM DRAIN.

(EXCERPT FROM FRANKLIN BEST MANAGEMENT PRACTICE MANUAL)
SEDIMENT FENCES:
USE PRINCIPALLY IN AREAS WHERE SHEET FLOW OCCURS.
- INSTALL ALONG A LEVEL CONTOUR, SO WATER DOES NOT POND MORE THAN 1.5 FEET (0.5 M) AT ANY POINT.
- THE MAXIMUM SLOPE PERPENDICULAR TO THE FENCE LINE SHOULD BE 1:1.
- NO MORE THAN 0.25 ACRE (0.1 HA) PER 100 FT. (31.4 M), OR 0.5 CFS (1.4 X 10-2 M3/S) OF CONCENTRATED FLOW SHOULD DRAIN TO ANY POINT ALONG THE SILT FENCE.
- TURN ENDS OF FENCE UPHILL TO PREVENT SCOUR FROM WASH AROUND.
- PROVIDE AREA BEHIND THE FENCE FOR RUNOFF TO POND AND SEDIMENT TO SETTLE (APPROX. 1200 SQ. FT. (111.5 M2) PER ACRE (0.4 HA) DRAINING TO THE SILT FENCE).
- SELECT FILTER FABRIC THAT RETAINS 85% OF THE SOIL, BY WEIGHT, BASED ON SIEVE ANALYSIS, BUT IS NOT FINER THAN AN EQUIVALENT OPENING SIZE OF 70.

• SEDIMENT MUST BE REMOVED FROM SEDIMENT BARRIERS, PONDS AND OTHER SEDIMENT CONTROLS WHEN DESIGN CAPACITY HAD BEEN REDUCED BY 33%. ALL EP&SC DEVICES ARE TO REMAIN IN PLACE UNTIL THE SITE HAS BEEN STABILIZED AND A GOOD STAND OF GRASS HAS BEEN ESTABLISHED.
• WHEN A SEDIMENT FENCE'S CAPACITY HAS BEEN REDUCED 33%, IT SHALL BE REPLACED.
• EROSIONS PREVENTION ANDSEDIMENT CONTROL DEVICES, EP&SC, SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD; GENERALLY CONSIDERED TO BE THROUGH THE COMPLETION OF RESTORATION. A COPY OF YOUR EP&SC PLAN ALONG WITH AN INSPECTION CHECKLIST AND STORMWATER PERMIT, IF APPLICABLE, MUST BE AT THE PROJECT SITE AT ALL TIMES. THE INSPECTION CHECKLIST SHALL HAVE A RECORD OF DATES EP&SC DEVICES ARE INSPECTED AND ANY CORRECTION ACTION TAKEN OR MAJOR OBSERVATIONS.
• EXCAVATED TOPSOIL TO BE REUSED MUST BE STOCKPILED AND ENCIRCLED WITH SILT FENCING.

CONSTRUCTION ENTRANCE: THIS SITE SHALL CONTAIN A TEMPORARY STONE CONSTRUCTION ENTRANCE THAT CONFORMS TO THE CITY OF FRANKLIN'S STORMWATER ORDINANCE AND BEST MANAGEMENT PRACTICE MANUAL. IT MUST BE INSTALLED WITHIN 24 HOURS OF GRADING OR THE PERMIT WILL BE REVOKED. THE USE OF FILTER CLOTH BENEATH CONSTRUCTION ENTRANCE IS REQUIRED. STONES SHOULD BE 3 INCH CRUSHED, WASHED, AND WELL GRADED ROCK TO AT LEAST A 6-INCH (15.2) DEEP AND SHALL BE KEPT CLEAN BY ADDING STONE AS NEEDED. IT SHALL BE 20 FEET WIDE. SEE DETAIL TCP-03 FOR SPECIFIC CONSTRUCTION ENTRANCE DETAILS. SEE HTTP://WWW.FRANKLIN-GOV.COM/ENGINEERING/STORMWATER/BMP/TCP/TCP-03.PDF
• A QUALIFIED PERSON WHO HAS TAKEN AN APPROVED EROSION AND SEDIMENTATION COURSE MUST INSPECT BMPS.
• WHERE APPLICABLE, INLET PROTECTIONS FOR NEARBY STORM SEWER CURB AND DROP INLETS HAVE BEEN INSTALLED.
• WHERE APPLICABLE, EXISTING VEGETATION AND BUFFER WILL BE MAINTAINED AND TEMPORARY COVER CROPS WILL BE USED.
• SEDIMENT THAT HAS ESCAPED THE CONSTRUCTION SITE AND HAS COLLECTED IN THE STREET OR DRAINAGE STRUCTURES MUST IMMEDIATELY BE PHYSICALLY REMOVED.
• BUILDING AND WASTE MATERIALS, AND NON-STORM WATER DISCHARGES, SUCH AS CONCRETE, PAINT WASHWATER, OR MACHINERY LEAKAGE OR SPILLAGE MUST BE MANAGED TO PREVENT THEM FROM ENTERING THE STORMWATER SYSTEM, GROUND WATER OR NEARBY WATER BODY.
• EP&SC AND STORMWATER CONTROLS SHALL BE INSTALLED AND MAINTAINED ACCORDING TO FRANKLIN'S BMP MANUAL. YOU CAN FIND A COPY OF IT AT: HTTP://WWW.FRANKLINGOV. COM/ENGINEERING/STORMWATER/INDEX.HTM
• STORMWATER DETENTION/RETENTION AND SEDIMENT PONDS WILL BE INSTALLED AT THE BEGINNING OF THE PROJECT.
• LARGE CONSTRUCTION SITES SHALL BE BUILT IN PHASES.
• STORMWATER DETENTION/RETENTION AND SEDIMENT PONDS WILL BE INSTALLED AT THE BEGINNING OF THE PROJECT.

DEWATERING: SEDIMENT TRAP/BASIN DEWATERING FOR CLEANOUT OR REPAIR MAY ONLY BE DONE WITH THE CITY OF FRANKLIN INSPECTOR'S PERMISSION. THE INSPECTOR MUST APPROVE THE DEWATERING METHOD FOR EACH APPLICATION. THE FOLLOWING METHODS MAY BE CONSIDERED:
A. PUMP DISCHARGE MAY BE DIRECTED TO ANOTHER ON-SITE SEDIMENT TRAP OR BASIN, PROVIDED IT IS OF SUFFICIENT VOLUME AND THE PUMP INTAKE IS FLOATED TO PREVENT AGITATION OR SUCTION OF DEPOSITED SEDIMENTS; OR
B. THE PUMP INTAKE MAY UTILIZE A REMOVABLE PUMPING STATION AND MUST DISCHARGE INTO AN UNDISTURBED AREA THROUGH A NON-EROSIVE OUTLET; OR
C. THE PUMP INTAKE MAY BE FLOATED AND DISCHARGE INTO A DIRT BAG (12 OZ. NONWOVEN FABRIC), OR APPROVED EQUIVALENT, LOCATED IN AN UNDISTURBED BUFFER AREA.
D. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A PUMPED WATER FILTER BAG OR EQUIVALENT SEDIMENT REMOVAL FACILITY, OVER UNDISTURBED VEGETATED AREAS.
• ANY REQUEST FOR CHANGES TO THE APPROVED SEDIMENT CONTROL PLAN OR SEQUENCE OF CONSTRUCTION MUST BE SUBMITTED TO THE SEDIMENT CONTROL INSPECTOR AND APPROVED BEFORE IMPLEMENTING CHANGES. MAJOR CHANGES WILL REQUIRE A PLAN REVISION.
• THE PERMITTEE SHALL PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO PREVENT THE DEPOSITION OF MATERIALS ONTO TRAVERSED PUBLIC THOROUGHFARE(S). ALL MATERIALS DEPOSITED ONTO PUBLIC THOROUGHFARE(S) SHALL BE REMOVED IMMEDIATELY.
• OBTAINING OF ANY PERMITS IS THE RESPONSIBILITY OF THE STORMWATER MANAGEMENT PERMIT HOLDER OR DEVELOPER.
• PERMITTEES SHALL MAINTAIN A RAIN GAUGE AND DAILY RAINFALL RECORDS AT THE SITE, OR USE A REFERENCE SITE FOR A RECORD OF DAILY AMOUNT OF PRECIPITATION.

STORMWATER PONDS AND WATER QUALITY MAINTENANCE NOTES

• CHECK OUTLET REGULARLY FOR CLOGGING AND REMOVE ANY DEBRIS.
• CHECK BANKS AND BOTTOM SURFACE OF BASIN FOR EROSION AND CORRECT AS NECESSARY.
• CHECK AT LEAST ANNUALLY AND AFTER EACH EXTREME STORMEVENT, THE FACILITY SHOULD BE CLEANED OF ACCUMULATED DEBRIS. THE BANKS OF SURFACE PONDS SHOULD BE CHECKED AND AREAS OF EROSION REPAIRED. REMOVE NUISANCE WETLAND SPECIES AND TAKE APPROPRIATE MEASURES TO CONTROL MOSQUITOES.
• THIS MAINTENANCE TYPICALLY INCLUDES SEDIMENT, FLOATABLE, AND DEBRIS REMOVAL FROM INLETS, OUTLETS AND SKIMMERS
• POND VEGETATION NEEDS TO BE TRIMMED OR HARVESTED AS APPROPRIATE, GRASSY AREAS FREQUENTLY MOWED.
• THE OUTLET STRUCTURE FILTER SHALL BE CHECKED REGULARLY FOR CLOGGING AND SHALL BE CLEANED AND REPAIRED AS NECESSARY.
• REMOVE SEDIMENT WHEN ACCUMULATION REACHED 6 INCHES, OR IF RE-SUSPENSION IS OBSERVED OR PROBABLE. SEDIMENT MAY BE PERMITTED TO ACCUMULATE DEEPER THAN 6 INCHES IF THERE IS A PERMANENT MARKER INDICATING DEPTH WHERE SEDIMENT NEEDS TO BE REMOVED, AND THAT MARK HAS NOT BEEN MET.
• SOME SEDIMENT MAY CONTAIN CONTAMINANTS OR WHICH THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) REQUIRES SPECIAL DISPOSAL PROCEDURE. IF THERE IS ANY UNCERTAINTY ABOUT WHAT THE SEDIMENT CONTAINS OR IT IS KNOWN TO CONTAIN CONTAMINANTS, THEN TDEC SHOULD BE CONSULTED AND THEIR DISPOSAL RECOMMENDATIONS FOLLOWED. THE TDEC DIVISION OF WATER POLLUTION CONTROL SHOULD BE CONTACTED AT (615) 532-0625. GENERALLY, SPECIAL ATTENTION OR SAMPLING SHOULD BE GIVEN TO SEDIMENT ACCUMULATED IN FACILITIES SERVING INDUSTRIAL, MANUFACTURING OR HEAVY COMMERCIAL SITES, FUELING CENTS OR AUTOMOTIVE MAINTENANCE AREAS, LARGE PARKING AREAS, IR OTHER AREAS WHERE POLLUTANTS (OTHER THAN CLEAN SOIL) ARE SUSPECTED TO ACCUMULATE AND BE CONVEYED BY STORM RUNOFF. SOME SEDIMENT COLLECTED MY BE INNOCUOUS (FREE OF POLLUTANTS) AND CAN BE USED AS FILL MATERIAL, COVER OR LAND SPREADING. IT IS IMPORTANT THAT THIS MATERIAL NOT BE PLACED IN ANY WAY THAT WILL PROMOTE OR ALLOW RE-SUSPENSION IN STORM RUNOFF.

ENHANCED SWALE INSPECTION AND MAINTENANCE NOTES

ACTIVITY	SCHEDULE
FOR DRY SWALES, MOW GRASS TO MAINTAIN A HEIGHT OF 4 TO 6 INCHES. REMOVE GRASS CLIPPINGS.	AS NEEDED (FREQUENT/SEASONAL)
INSPECT GRASS ALONG SIDE SLOPES FOR EROSION AND FORMATION OF RILLS OR GULLIES AND CORRECT.	ANNUALLY (SEMI-ANNUALY THE FIRST YEAR)
REMOVE TRASH AND DEBRIS ACCUMULATED IN THE INFLOW FOREBAY.	
INSPECT AND CORRECT EROSION PROBLEMS IN THE SAND/SOIL BED OF DRY SWALES.	
BASED ON INSPECTION, PLANT AN ALTERNATIVE GRASS SPECIES IF THE ORIGINAL GRASS COVER HAS NOT BEEN SUCCESSFULLY ESTABLISHED.	
REPLANT WETLAND SPECIES (FOR WET SWALE) IF NOT SUFFICIENTLY ESTABLISHED.	
INSPECT PEA GRAVEL DIAPHRAGM FOR CLOGGING AND CORRECT THE PROBLEM.	
ROTO-TILL OR CULTIVATE THE SURFACE OF THE SAND/SOIL BED OF DRY SWALES IF TEH SWALE DOES NOT DRAW DOWN WITHIN 48 HOURS.	AS NEEDED
REMOVE SEDIMENT BUILDUP WITHIN THE BOTTOM OF THE SWALE ONCE IT HAS ACCUMULATED 25% OF THE ORIGINAL DESIGN VOLUME.	

STORMWATER INFRASTRUCTURE "AS BUILTS": FRANKLIN CODE SECTION 16-706 (2)(GG): AS NEW DEVELOPMENT CONSTRUCTION IS COMPLETED, AN "AS-BUILT" PLAN, CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER, MUST BE SUBMITTED UPON COMPLETION OF THE STORMWATER MANAGEMENT FACILITIES INCLUDED IN THE APPROVED CONSTRUCTION PLANS THE LICENSED PROFESSIONAL SHALL CERTIFY THAT: THE FACILITIES HAVE BEEN CONSTRUCTED AS SHOWN ON THE "ASBUILT" PLAN, AND FACILITIES MEET THE APPROVED STORMWATER MANAGEMENT PLAN AND SPECIFICATIONS, OR ACHIEVE THE FUNCTION FOR WHICH THEY WERE DESIGNED. COORDINATE DATA SHALL BE PRESENTED IN THE STATE OF TENNESSEE PLANE SYSTEM WITH THE NORTH AMERICAN DATUM 1983 (NAD83) AND NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988. ELECTRONIC AND 2 PAPER COPIES (PER CITY REQUIREMENTS) ARE REQUIRED.
A. (SEE WEB SITE HTTP://WWW.FRANKLIN-GOV.COM/PDF/ASBUILTREQUIREMENTS.)

Kimley»Horn
214 Oneville Drive
Knoxville, TN 37934
Main: 615-564-2701
www.kimley-horn.com
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

RYAN McMASTER — LICENSED PROFESSIONAL ENGINEER — No. 120008 — STATE OF TENNESSEE — 4/7/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY: RJA
DRAWN BY: RJA
CHECKED BY: RLM
DATE: 03/14/2016
KHA PROJECT NO. 118133000

CITY OF FRANKLIN NOTES

SHEET NUMBER
C0.2
COF# 6076

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SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT:	KIMLEY-HORN & ASSOCIATES
Address:	214 OCEANSIDE DRIVE NASHVILLE, TN 37204
Phone:	615-564-2701
Email:	RYAN.MCMASTER@KIMLEY-HORN.COM
Contact Name:	RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
BUILDING SQUARE FOOTAGE:	101,501 SF
PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
MINIMUM LANDSCAPE SURFACE RATIO:	0.30 (2.07 AC PHASE 1)
PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
PARKING PROVIDED:	149 TOTAL SPACES 145 STANDARD SPACES 4 ADA SPACES 0 COMPACT SPACES
EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:

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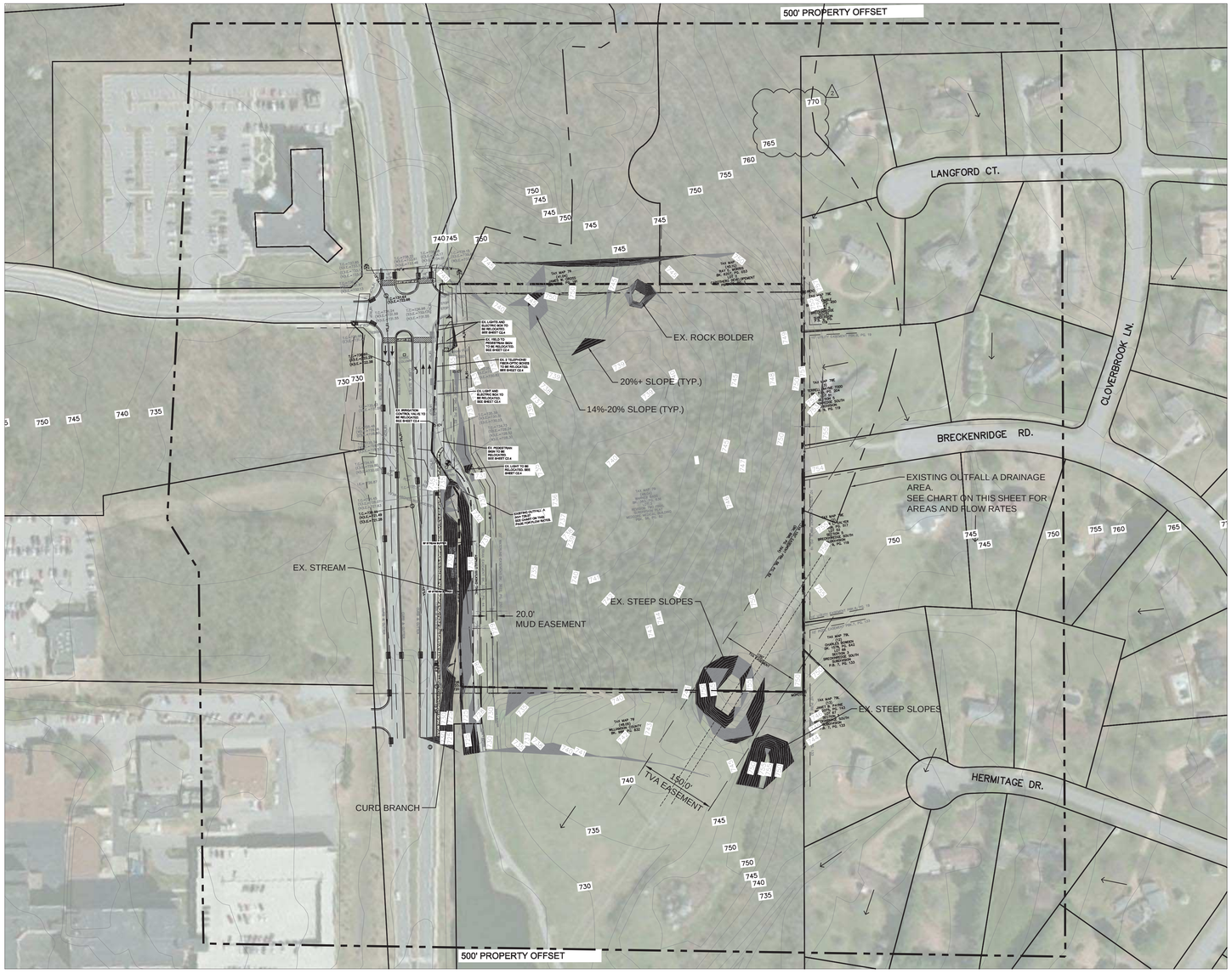
5. THE CONSULTANT HAS FOUND NO EVIDENCE OF THE MINERAL RIGHTS OF THIS PROPERTY BEING TRANSFERRED TO ANY PARTY OTHER THAN THE OWNER.
6. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO BUILDINGS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006



LINE TABLE		
LINE	LENGTH	BEARING
L1	24.50'	N42°25'25"E
L2	5.00'	S82°25'54"E
L3	54.27'	N07°34'06"E

CURVE TABLE						
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD	CHD BEARING
C1	77.04'	92.00'	47°58'48"	40.94'	74.81'	N16°51'24"W
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EXISTING OUTFALL 1 GRADING AND DRAINAGE CHART

	ON-SITE	OFFSITE	TOTAL
TOTAL AREA	11.62 ACRES	12.03 ACRES	23.65 ACRES
IMPERVIOUS AREA	0.00	0.38	0.38
2-YEAR STORM FLOW RATE	6.65 CFS	22.37 CFS	29.02 CFS
5-YEAR STORM FLOW RATE	13.65 CFS	25.9 CFS	39.55 CFS
10-YEAR STORM FLOW RATE	18.87 CFS	28.79 CFS	45.66 CFS
25-YEAR STORM FLOW RATE	25.96 CFS	32.38 CFS	58.34 CFS
50-YEAR STORM FLOW RATE	31.46 CFS	35.28 CFS	66.74 CFS
100-YEAR STORM FLOW RATE	37.03 CFS	37.6 CFS	74.63 CFS

DOWNSTREAM STORM STRUCTURES

THE NEXT THREE DOWNSTREAM STRUCTURES ARE MEASURED FROM THE SOUTHWEST CORNER OF THE PROPERTY BOUNDARY:

1) 707' - 30" CMP (POND OUTLET)
2) 717' - 42" X 120" BOX CULVERT (POND OVERFLOW)
3) 1218' - 25" X 9' ARCH CULVERT (ENTRY DRIVE TO HOSPITAL)

SLOPE LEGEND

EXISTING SLOPES	SHADE
14-19.99%	
20%+	

NOTE: NO PORTIONS OF THE PLANNED ROADWAY NETWORK ARE WITHIN 1500' OF THE SITE PER THE FRANKLIN MAJOR THOROUGHFARE PLAN, OTHER THAN THE EXISTING CAROTHERS PARKWAY.

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

Kimley»Horn
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Nashville, TN 37204
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER
REGISTERED
LANDSCAPE
ARCHITECT
NO. 108432
STATE OF TENNESSEE
4/7/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	RJA
DRAWN BY:	RJA
CHECKED BY:	BRC
DATE:	03/14/2016
KHA PROJECT NO.	118133000

OVERALL EXISTING CONDITIONS PLAN

SHEET NUMBER
C1.0
COF# 6076

Drawing name: K:\NSH_LDEV\118133000 - Carothers MOB\4-CADD\3-PlanSheets\C1.0 Existing Conditions - 118133000.dwg C1.0 Overall Existing Conditions Apr 07, 2016 10:18am by: yates.bateman

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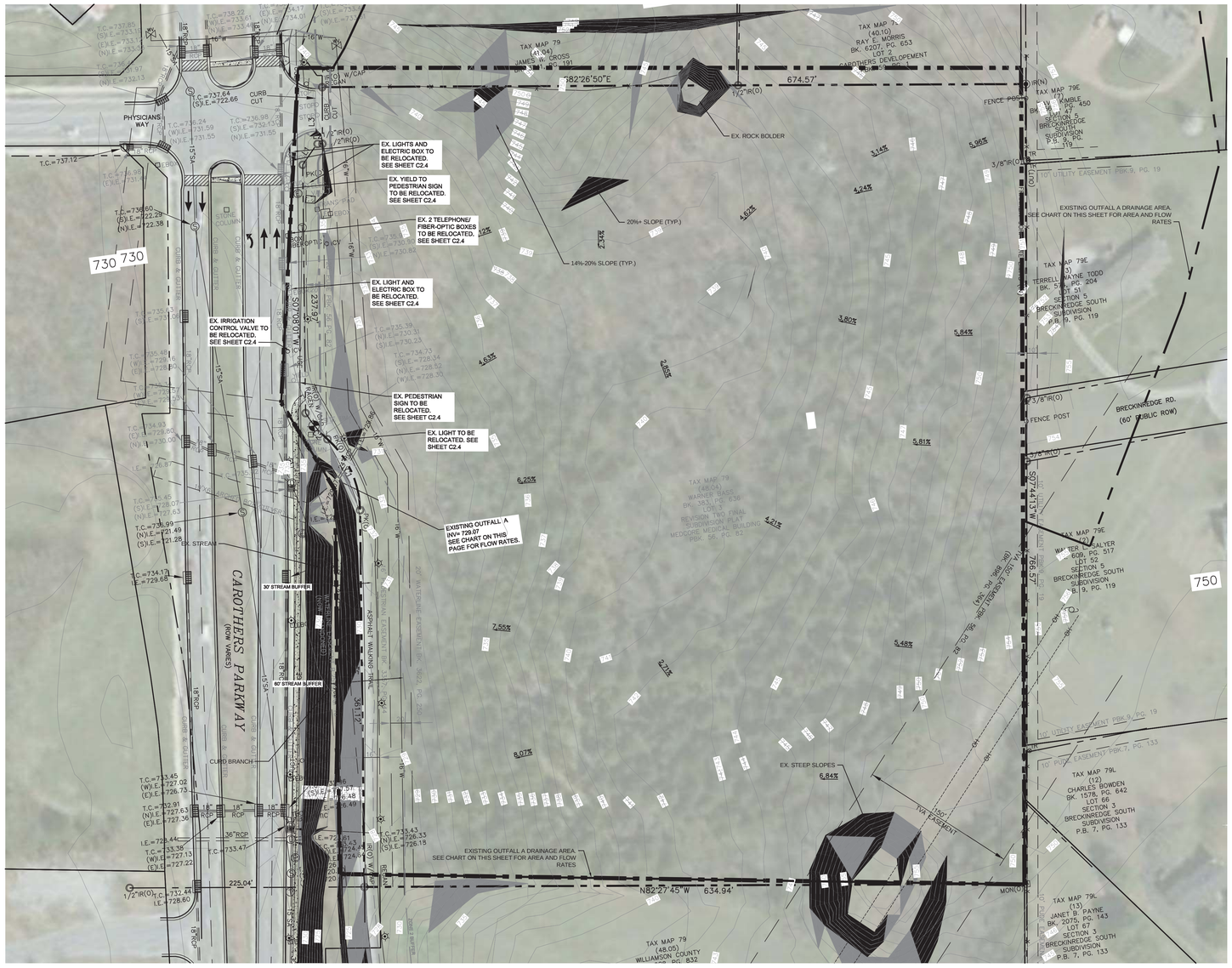

EXISTING OUTFALL A GRADING AND DRAINAGE CHART

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STORMWATER NARRATIVE

IN THE CURRENT CONDITION, DURING A STORM EVENT STORMWATER SHEET FLOWS FOR THE FIRST 100' BEFORE MOVING TO SHALLOW CONCENTRATED FLOW WHERE IT DISCHARGES INTO THE EXISTING OUTFALL A AND CURD BRANCH. THERE IS A TIME OF CONCENTRATION OF 16.3 MINUTES.

SLOPE LEGEND

EXISTING SLOPES	SHADE
14-19.99%	
20%+	

NOTE: NO PORTIONS OF THE PLANNED ROADWAY NETWORK ARE WITHIN 1500' OF THE SITE PER THE FRANKLIN MAJOR THOROUGHFARE PLAN, OTHER THAN THE EXISTING CAROTHERS PARKWAY.

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

Drawing name: K:\NSH_LDEV\118133000 - Carothers MOB\4-CADD\3-PlanSheets\C1.0 Existing Conditions - 118133000.dwg C1.1 Enlarged Existing Conditions Apr 07, 2016 10:18am by: yates.bateman

Kimley»Horn
214 Oceanside Drive
Nashville, TN 37204
Main: 615.564.2701
www.kimley-horn.com
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GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER — TENNESSEE — 108482 — REGISTERED PROFESSIONAL ENGINEER — 4/5/16

No.	BY	DATE	REVISIONS
1		04/07/2016	PER CITY COMMENTS

DESIGNED BY: CJM
DRAWN BY: CJM
CHECKED BY: RLM
DATE: 03/14/2016
KHA PROJECT NO. 118133000

ENLARGED EXISTING CONDITIONS PLAN

SHEET NUMBER
C1.1
COF# 6076

SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT:	KIMLEY-HORN & ASSOCIATES
Address:	214 OCEANSIDE DRIVE NASHVILLE, TN 37204
Phone:	615-564-2701
Email:	RYAN.MCMASTER@KIMLEY-HORN.COM
Contact Name:	RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
BUILDING SQUARE FOOTAGE:	101,501 SF
PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
MINIMUM LANDSCAPE SURFACE RATIO:	0.30 (2.07 AC PHASE 1)
PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
PARKING PROVIDED:	149 TOTAL SPACES 145 STANDARD SPACES 4 ADA SPACES 0 COMPACT SPACES
EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:

1. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
2. THIS SITE PLAN HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN STANDARDS AND THE APPROVAL OF PLANNING COMMISSION. CHANGES SHALL NOT BE MADE TO THE APPROVED SITE PLAN UNLESS APPROVED BY EITHER RELEVANT DEPARTMENT SUPERINTENDENT OR THE PLANNING COMMISSION.
3. THE INFORMATION SHOWN ON THIS PLAN IS BASED UPON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIPZONE 4100 AND NAD 83 DATUM.
4. BASE INFORMATION WAS TAKEN FROM A TOPOGRAPHIC SURVEY PREPARED BY LITTLEJOHN, DATED MARCH 23, 2015. KIMLEY-HORN AND ASSOCIATES SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF THE BASE INFORMATION SHOWN.
5. THE CONSULTANT HAS FOUND NO EVIDENCE OF THE MINERAL RIGHTS OF THIS PROPERTY BEING TRANSFERRED TO ANY PARTY OTHER THAN THE OWNER.
6. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO BUILDINGS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006

NOTES:

1. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
2. ALL PAVEMENT SHOWN OUTSIDE OF THE HEAVY DUTY AREAS SHALL BE LIGHT DUTY ASPHALT PAVEMENT.

PAVEMENT LEGEND

CONCRETE

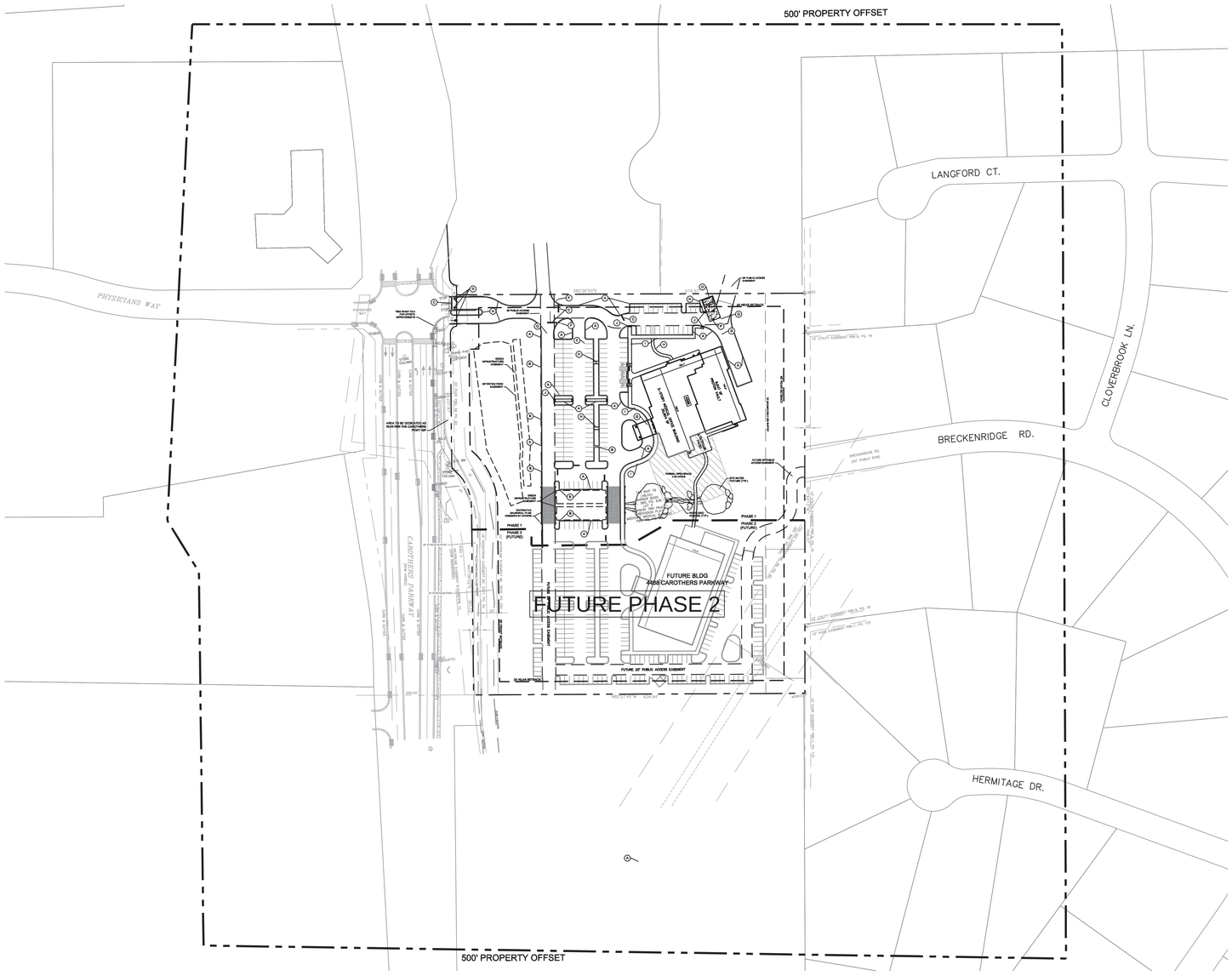
HEAVY DUTY PAVEMENT

LINE TABLE		
LINE	LENGTH	BEARING
L1	24.50'	N42°25'25"E
L2	5.00'	S82°25'54"E
L3	54.27'	N07°34'06"E

CURVE TABLE						
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD	CHD BEARING
C1	77.04'	92.00'	47°58'48"	40.94'	74.81'	N16°51'24"W
C2	32.84'	108.00'	17°25'13"	16.55'	32.71'	N32°08'09"W

HATCH LEGEND

FORMAL OPEN SPACE



NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

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DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

BRYAN McMASTER
REGISTERED
LANDSCAPE
ARCHITECT
108182
STATE OF TENNESSEE
4/5/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	CJM
DRAWN BY:	CJM
CHECKED BY:	RLM
DATE:	03/14/2016
KHA PROJECT NO.	118133000

OVERALL SITE PLAN

SHEET NUMBER
C2.0

COF# 6076

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Drawing name: K:\NSH_LDEV\118133000 - Carothers MOB\4-CADD\3-PlanSheets\C2.0 Site Layout - 118133000.dwg C2.0 Overall Site Layout Apr 07, 2016 10:19am by: yates.bateman

SITE DATA CHART

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COF PROJECT #:	6076
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COUNTY:	WILLIAMSON
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DEVELOPMENT STANDARD:	CONVENTIONAL
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DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT: Address: Phone: Email: Contact Name:	KIMLEY-HORN & ASSOCIATES 214 OCEANSIDE DRIVE NASHVILLE, TN 37204 615-564-2701 RYAN.MCMASTER@KIMLEY-HORN.COM RYAN McMASTER
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NOTES:

1. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
2. ALL PAVEMENT SHOWN OUTSIDE OF THE HEAVY DUTY AREAS SHALL BE LIGHT DUTY ASPHALT PAVEMENT.
3. CANOPIES OR OTHER STRUCTURES SHALL PROVIDE AT LEAST 176" OF UNOBSTRUCTED VERTICAL CLEARANCE ABOVE FINISHED GRADE.

PAVEMENT LEGEND

CONCRETE

HEAVY DUTY PAVEMENT

LINE TABLE		
LINE	LENGTH	BEARING
L1	24.50'	N42°25'25"E
L2	5.00'	S82°25'54"E
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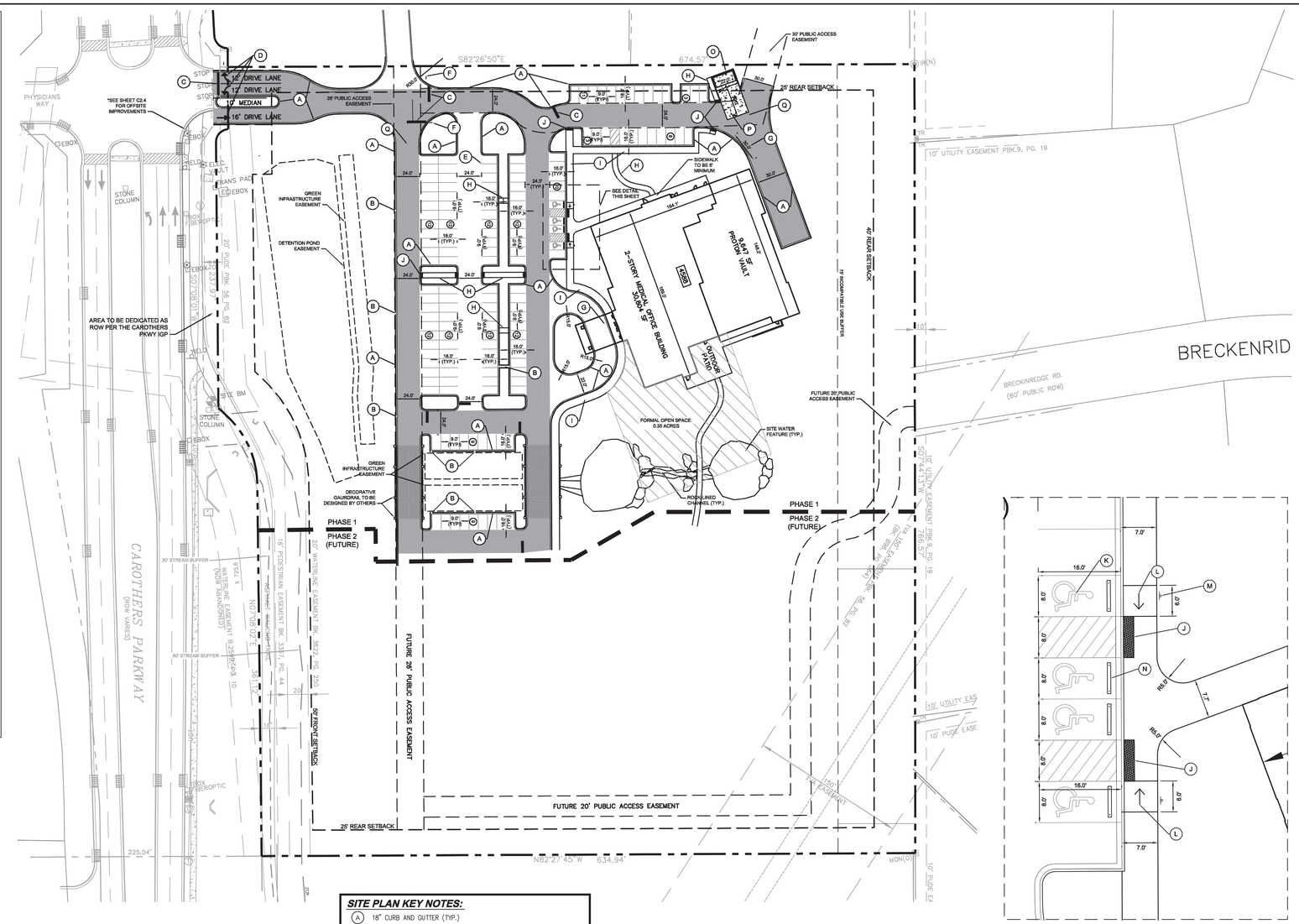
HATCH LEGEND

FORMAL OPEN SPACE



ADA PARKING
SCALE 1" = 10'

SITE PLAN KEY NOTES:

- (A) 18" CURB AND GUTTER (TYP.)
- (B) 2' CURB CUT (TYP.)
- (C) WHITE THERMOPLASTIC STOP BAR (TYP.)
- (D) WHITE THERMOPLASTIC DIRECTIONAL ARROWS
- (E) 4" PARKING STRIPE (TYP.)
- (F) STOP SIGN (TYP.)
- (G) LOADING ZONE
- (H) 5' SIDEWALK
- (I) 7' SIDEWALK
- (J) ADA DETECTABLE WARNINGS (TYP.)
- (K) PAINTED ADA SYMBOL (TYP.)
- (L) ADA RAMP (TYP.)
- (M) ACCESSIBLE PARKING SIGN (TYP.)
- (N) WHEEL STOP (TYP.)
- (O) DOUBLE SCREENED TRASH ENCLOSURE (SEE ARCH. PLANS FOR DETAILS)
- (P) CONCRETE DUMPSTER PAD (SEE ARCH. PLANS FOR DETAILS)
- (Q) HEAVY DUTY PAVEMENT

NOTE:

SEE SHEET C2.4 FOR OFFSITE IMPROVEMENTS TO CAROTHERS PKWY

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

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SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER
REGISTERED ENGINEER
No. 109892
STATE OF TENNESSEE
4/1/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	CJM
DRAWN BY:	CJM
CHECKED BY:	RLM
DATE:	03/14/2016
KHA PROJECT NO.	118133000

ENLARGED SITE PLAN

SHEET NUMBER
C2.1

COF# 6076

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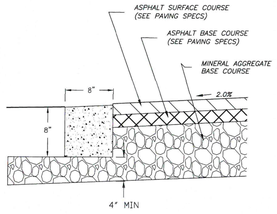
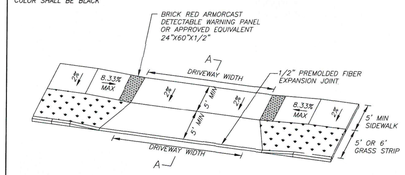


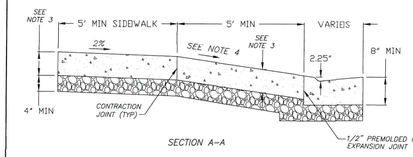
GENERAL NOTES:
1. FOR SPECIFICATIONS SEE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION, SECTION 702 – CEMENT CONCRETE CURB, GUTTER AND COMBINED CURB AND GUTTER.
2. CONCRETE EXPANSION JOINT MATERIAL IS TO BE 3/4" PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 – JOINT MATERIALS OF THE STAND SPECIFICATIONS.
3. CONTRACTION JOINTS ARE TO BE SPACED AT 10 FEET. THE SPACING OF 10 FEET MAY BE REDUCED FOR CLOSURES, BUT NOT LESS THAN 6 FEET
3. EPANSION JOINTS AREA TO BE PLACED AS FOLLOWS: AT TANGENT OINTS OF CIRCULAR CURBS, BETWEEN CURBS AND ABUTTING RIGID OBJECTS, AT OTHER PLACES WEHRE STRESSES MAY DEVELOP, SO AS TO LINE UP WITH PAVEMENT JOINTS WHERE THE ADJACENT PAVEMENT IS CONCRETE MAXIMUM SPACING IS TO BE 100 FEET

N.T.S

CITY OF FRANKLIN	CITY ENGINEER	DATE
ALLEY RIBON CURB		
DWG. NO. RP–4	EFFECTIVE DATE: 01/08/2015	DIRECTOR OF ENGINEERING DATE 12/8/14

**DOWNTOWN STREET SCAPE COLOR SHALL BE BLACK



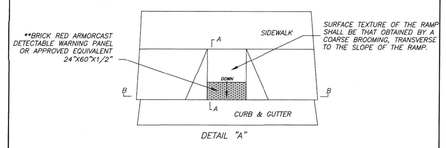


SECTION A–A

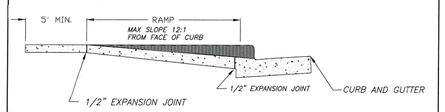
GENERAL NOTES:
1. 5' MINIMUM SIDEWALK WITH A MAXIMUM CROSS SLOPE OF 2% THROUGH DRIVEWAYS
2. 4" MIN BASE STONE REQUIRED UNDER ALL DRIVES
3. COMMERCIAL DRIVEWAYS SHALL BE A MIN 8" OF CLASS "A" CONCRETE WITH SYNTHETIC FIBER REINFORCEMENT.
4. DRIVEWAY RAMP GRADE VARIES, 8.33% MAX APRON GRADE FOR RESIDENTIAL DRIVEWAYS. 6.0% MAX APRON GRADE FOR COMMERCIAL DRIVEWAYS

CITY OF FRANKLIN	CITY ENGINEER	DATE
LOWERED CONCRETE DRIVEWAY (WITH GRASS STRIP)		
DWG. NO. RP–7	EFFECTIVE DATE: 01/08/2015	DIRECTOR OF ENGINEERING DATE 12/8/14

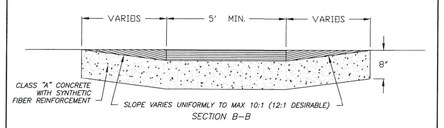
**DOWNTOWN STREET SCAPE COLOR SHALL BE BLACK



DETAIL "A"



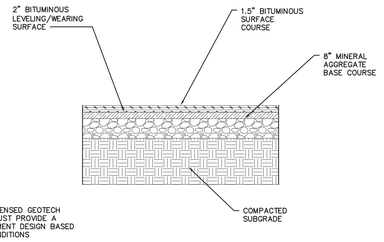
SECTION A–A



SECTION B–B

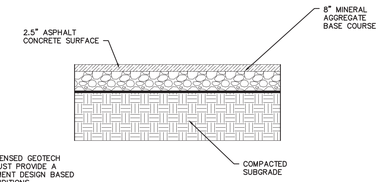
GENERAL NOTES
1. A VARIATION OF THE RAMP MAY BE USED IN CERTAIN CIRCUMSTANCES BUT MUST COMPLY WITH ACCESSIBILITY CODE REQUIREMENTS
2. DESIRABLE SLOPE TO BE USED UNLESS OTHERWISE DIRECTED BY THE CITY OF FRANKLIN.
3. MINIMUM LANDING AT TOP OF RAMP IS 5'.
4. RAMPS SHALL BE PROVIDED AT ALL STREET INTERSECTIONS, WALK LOCATIONS AND MID–BLOCK LOCATIONS.
5. RAMPS SHALL BE 8" OF CLASS "A" CONCRETE WITH SYNTHETIC FIBER REINFORCEMENT.
6. 4" BASE STONE REQUIRED UNDERA ALL RAMPS

CITY OF FRANKLIN	CITY ENGINEER	DATE
HANDICAP RAMP AND DETECTABLE WARNING		
DWG. NO. RP–12	EFFECTIVE DATE: 01/08/2015	DIRECTOR OF ENGINEERING DATE 12/8/14



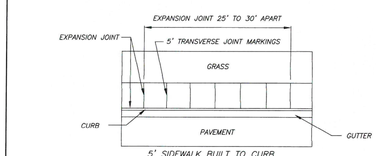
NOTE: A LICENSED GEOTECH ENGINEER MUST PROVIDE A FINAL PAVEMENT DESIGN BASED ON SITE CONDITIONS

1 TYPICAL PAVEMENT SECTION - HEAVY DUTY
SCALE:

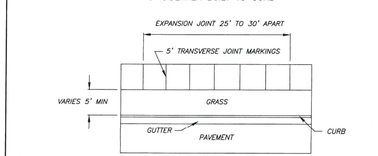


NOTE: A LICENSED GEOTECH ENGINEER MUST PROVIDE A FINAL PAVEMENT DESIGN BASED ON SITE CONDITIONS

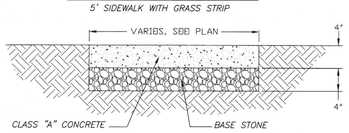
2 TYPICAL PAVEMENT SECTION - LIGHT DUTY
SCALE:



5' SIDEWALK BUILT TO CURB



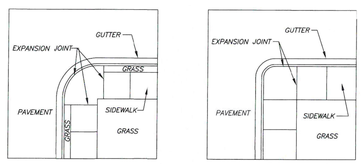
5' SIDEWALK WITH GRASS STRIP



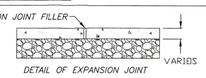
GENERAL NOTES
1. CLASS "A" CONCRETE, MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI WITH SYNTHETIC FIBER REINFORCEMENT.
2. ALSO SEE EXPANSION JOINT DETAIL
3. ROOT BARRIERS REQUIRED ON BOTH SIDES OF GRASS STRIP AROUND TREES.

N.T.S

CITY OF FRANKLIN	CITY ENGINEER	DATE
TYPICAL 5' CONCRETE SIDEWALK		
DWG. NO. RP–9	EFFECTIVE DATE: 01/08/2015	DIRECTOR OF ENGINEERING DATE 12/8/14



EXPANSION JOINT VARIATIONS

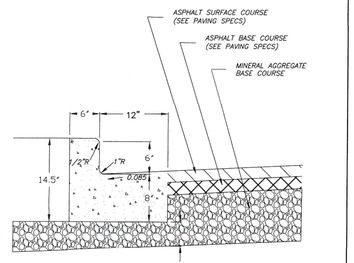


DETAIL OF EXPANSION JOINT

GENERAL NOTES
1. ALSO SEE SIDEWALK DETAILS
2. 1" JOINTS TO BE PLACED WHERE THE SIDEWALK IS IN CONTACT WITH CIRCULAR CURB, BUILDINGS AND RETAINING WALLS. 1/2" JOINTS TO BE USED AT OTHER LOCATIONS.
3. ONE LONGITUDINAL JOINT MARKING REQUIRED ON SIDEWALK OVER 5' IN WIDTH TO LESS THAN 9'. TWO LONGITUDINAL JOINTS FOR SIDEWALK 10' TO 12'.

N.T.S

CITY OF FRANKLIN	CITY ENGINEER	DATE
TYPICAL SIDEWALK EXPANSION JOINT		
DWG. NO. RP–11	EFFECTIVE DATE: 01/08/2015	DIRECTOR OF ENGINEERING DATE 12/8/14

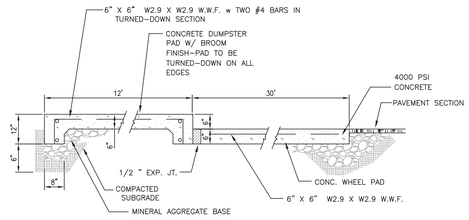


18" SIDE VIEW

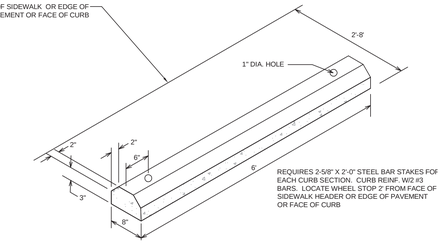
GENERAL NOTES
1. USE OF 24" CURB AND GUTTER SECTION SHALL BE USED WITH A NENA R–3067 TYPE "L" GRATE WITH ENVIRONOTICE PLATES R–3000–C SURFACE MOUNT.
2. CONCRETE TO BE 3000 PSI (MIN).

N.T.S

CITY OF FRANKLIN	CITY ENGINEER	DATE
18" CURB AND GUTTER SECTION (LOCAL STREETS ONLY)		
DWG. NO. RP–2	EFFECTIVE DATE: 01/08/2015	DIRECTOR OF ENGINEERING DATE 12/8/14



3 PRECAST CONCRETE WHEEL STOP
SCALE:



REQUIRES 2-5/8" X 2'-0" STEEL BAR STAKES FOR EACH CURB SECTION. CURB REINF. W2 X3 BARS. LOCATE WHEEL STOP 2' FROM FACE OF SIDEWALK HEADER OR EDGE OF PAVEMENT OR FACE OF CURB

4 CONCRETE DUMPSTER PAD
SCALE:

Kimley»Horn
214 Centerview Drive
Suite 343
Nashville, TN 37228
Main: 615.564.2701
www.kimley-horn.com
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER
NO. 109825
STATE OF TENNESSEE
4/7/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	CJM
DRAWN BY:	CJM
CHECKED BY:	RLM
DATE:	03/14/2016
KHA PROJECT NO.	118133000

SITE PLAN DETAILS

SHEET NUMBER
C2.2
COF# 6076

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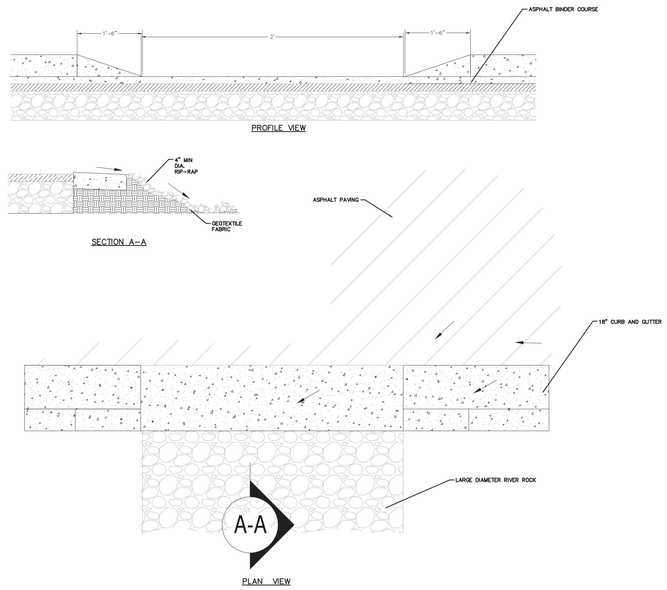
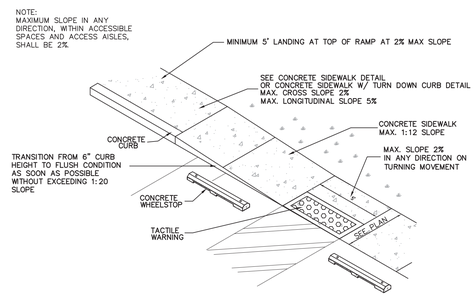


2 CURB CUT DETAIL
SCALE:



1 DETECTABLE WARNING RAMP
SCALE:

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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

RYAN McMASTER
REGISTERED ENGINEER
COMMERCE
100892
STATE OF TENNESSEE
4/5/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY: CJM
DRAWN BY: CJM
CHECKED BY: RLM
DATE: 03/14/2016
KHA PROJECT NO. 118133000

SITE PLAN DETAILS

SHEET NUMBER
C2.3
COF# 6076

Drawing name: K:\NSH_LDEV\118133000 - Carothers MOB\4-CADD\3-PlanSheets\C2.2-C5.3 Details - 118133000.dwg C2.3 Site Plan Details Apr 07, 2016 10:21am by: yates.bateman

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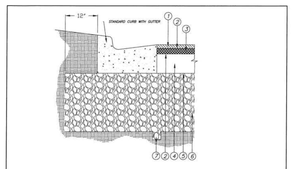


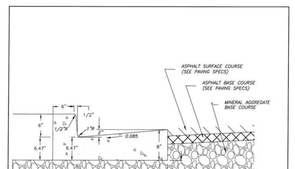
1. 1.5" – BITUMINOUS SURFACE COURSE. 411-03.10 ACS MIX(PG76-22) GRADING D
2. TACK COAT 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) @0.02 GAL/SY
3. 3" – BITUMINOUS AGGREGATE BASE 307-03.08 ASPHALT CONCRETE MIX (PG76-22)(BPMB-HM) GRADING B-M2
4. TACK COAT 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) @0.02 GAL/SY
5. 4" – BITUMINOUS AGGREGATE BASE 307-03.01 ASPHALT CEMENT MIX BASE (PG76-22) BPMB-HM GRADING "A" (APPROX 460 LBS/SY)
6. PRIME COAT 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) @0.30-0.35 GAL/SY 402-02 AGGREGATE FOR COVER MATERIAL (PC) #8-13.(#5)
7. 12" MINERAL AGGREGATE BASE 303-01 MINERAL 303-01 MINERAL AGGREGATE, TYPE "A" BASE, GRADING"D"

AGGREGATE UNDER DRAINS (W/PIPE) (COORDINATE WITH STANDARD SDDT STD. DRAWING RD---UD--3)

GENERAL NOTES:
1. MAXIMUM SIDESLOPE WHETHER IN CUT OR FILL IS TO BE 2:1.
2. ASPHALT THICKNESSES ARE MINIMUMS. THICKNESSES TO BE DETERMINED BY GEOTECHNICAL DESIGN.
3. REFERENCE TDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION

N.T.S

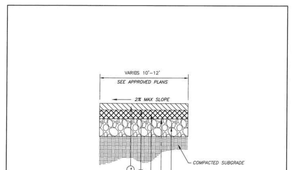
CITY OF FRANKLIN	CITY ENGINEER	DATE
MAJOR AND MINOR ARTERIAL PAVEMENT SECTION		
DWG. NO. RD–1	EFFECTIVE DATE: 01/08/2015	DIRECTOR OF ENGINEERING DATE



GENERAL NOTES:
1. FOR SPECIFICATIONS SEE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION, SECTION 702 – CEMENT CONCRETE CURB, GUTTER AND COMBINED CURB AND GUTTER.
2. CONCRETE EXPANSION JOINT MATERIAL IS TO BE 3/4" PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 – JOINT MATERIALS OF THE STAND SPECIFICATIONS.
3. CONTRACTION JOINTS ARE TO BE SPACED AT 10 FEET. THE SPACING OF 10 FEET MAY BE REDUCED FOR CLOSURES, BUT NOT LESS THAN 6 FEET.
3. EXPANSION JOINTS AREA TO BE PLACED AS FOLLOWS: AT TANGENT JOINTS OF CIRCULAR CURBS, BETWEEN CURBS AND ABUTTING ROAD OBJECTS, AT OTHER PLACES WHERE STRESSES MAY DEVELOP, SO AS TO LINE UP WITH PAVEMENT JOINTS WHERE THE ADJACENT PAVEMENT IS CONCRETE MAXIMUM SPACING IS TO BE 100 FEET

N.T.S

CITY OF FRANKLIN	CITY ENGINEER	DATE
ARTERIAL AND COLLECTOR CURB AND GUTTER		
DWG. NO. RP–1	EFFECTIVE DATE: 01/08/2015	DIRECTOR OF ENGINEERING DATE



1. 1.5" – BITUMINOUS SURFACE COURSE (ROADWAY) 411-01.03 ACS MIX(PG64-22) GRADING E ROW)
2. TACK COAT 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) @0.02 GAL/SY
3. 2" – BITUMINOUS AGGREGATE BASE 307-01.08 ASPHALT CONCRETE MIX (PG64-22)(BPMB-HM) GRADING B-M2
4. PRIME COAT 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) @0.30–0.35 GAL/SY 402-02 AGGREGATE FOR COVER MATERIAL (PC) #8–13.(#5)
5. 4" MINERAL AGGREGATE BASE 303–01 MINERAL 303–01 MINERAL AGGREGATE, TYPE "A" BASE, GRADING"D"

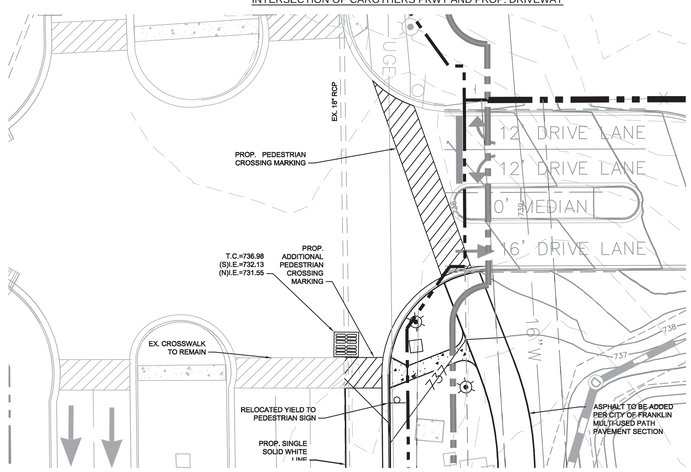
GENERAL NOTES:
1. ASPHALT THICKNESSES ARE MINIMUMS. THICKNESSES TO BE DETERMINED BY GEOTECHNICAL DESIGN.
2. REFERENCE TDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION

N.T.S

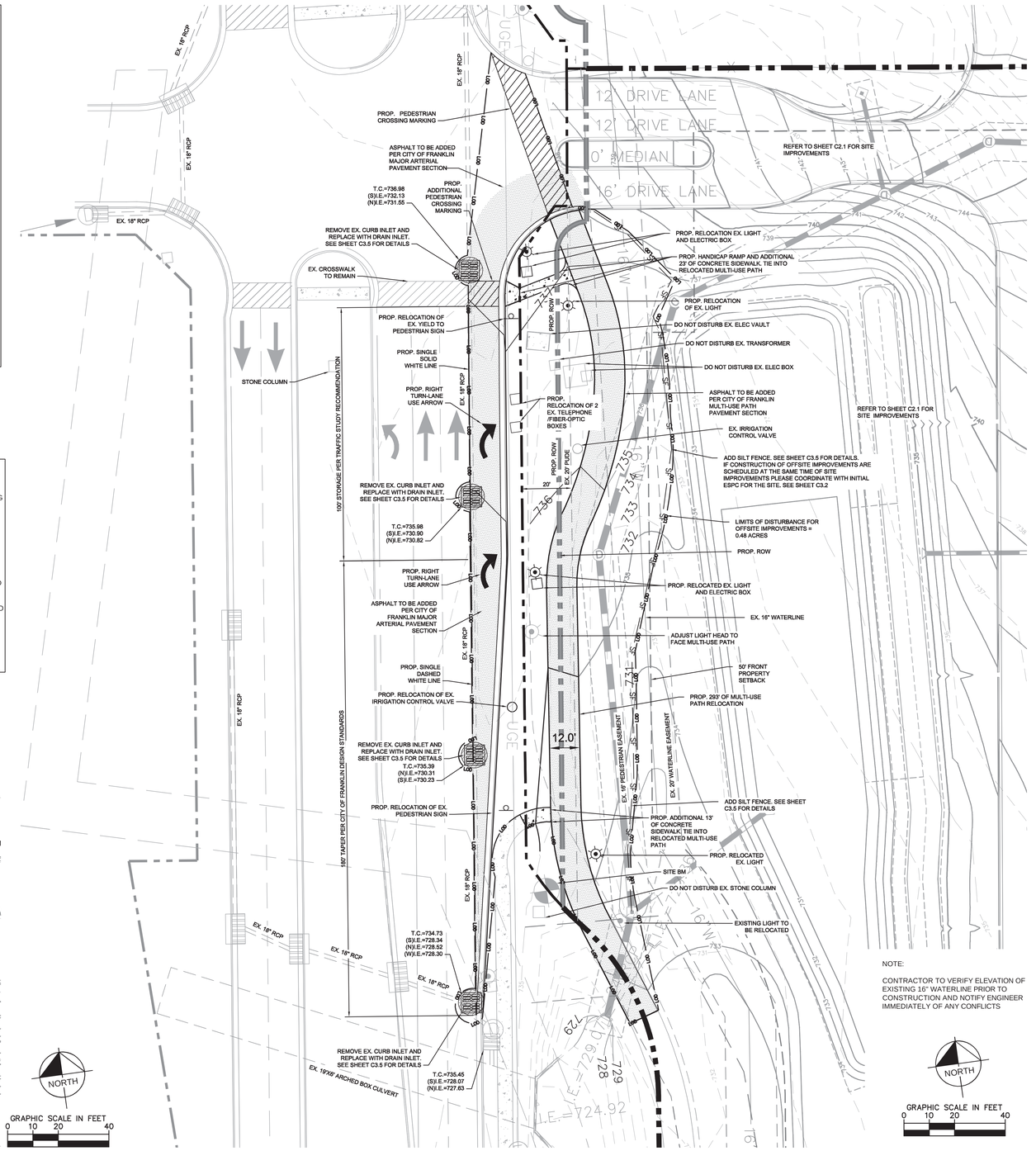
CITY OF FRANKLIN	CITY ENGINEER	DATE
MULTIUSE TRAIL (PUBLIC AND PRIVATE)		
DWG. NO. RD–4	EFFECTIVE DATE: 01/08/2015	DIRECTOR OF ENGINEERING DATE

NOTES:
1. THE CONTRACTOR SHALL MAKE EVERY EFFORT POSSIBLE TO MINIMIZE DISTURBANCE OF TRAFFIC ON CAROTHERS PKWY. CONSTRUCTION SHALL ONLY TAKE PLACE BETWEEN THE HOURS OF 9:00AM TO 3:00PM, MONDAY-FRIDAY AND SHALL NOT TAKE PLACE BETWEEN THANKSGIVING AND CHRISTMAS. THE CONTRACTOR NEEDS TO NOTIFY THE CITY OF FRANKLIN TRAFFIC OPERATIONS CENTER, EMERGENCY PERSONNEL (FIRE & POLICE), 72 HOURS PRIOR TO LANE SHIFTS.
2. A MINIMUM OF ONE NORTHBOUND LANE SHALL REMAIN OPEN AT ALL TIMES. IF CLOSURE IS NECESSARY, IT SHALL BE DONE AT NIGHT AND WILL REQUIRE A DETOUR PLAN FOR APPROVAL BY THE CITY OF FRANKLIN ENGINEERING DEPARTMENT PRIOR TO ANY CLOSURES.
3. DIRECTIONAL SIGNAGE AND STRIPING SHALL BE INSTALLED PER MUTCD STANDARDS.
4. FLAG MEN SHALL BE PRESENT AT ANY TIME THAT TRAFFIC IS LIMITED TO ONE NORTHBOUND TRAVEL LANE.
5. ALL STRIPING TO BE 4" THERMOPLASTIC UNLESS NOTED OTHERWISE.
6. THE APPLICANT IS TO COMPLETE AND OBTAIN FULL CITY OF FRANKLIN ACCEPTANCE OF ALL OFF-SITE TRANSPORTATION IMPROVEMENTS PRIOR TO THE ISSUANCE OF THE INITIAL CERTIFICATE OF OCCUPANCY.

INTERSECTION OF CAROTHERS PKWY AND PROP. DRIVEWAY



GRAPHIC SCALE IN FEET
0 10 20 40



NOTE:

CONTRACTOR TO VERIFY ELEVATION OF EXISTING 16" WATERLINE PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER IMMEDIATELY OF ANY CONFLICTS

GRAPHIC SCALE IN FEET
0 10 20 40

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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER
REGISTERED
LICENSED
PROFESSIONAL
ENGINEER
No. 109025
STATE OF TENNESSEE
4/1/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	RJA
DRAWN BY:	RJA
CHECKED BY:	RLM
DATE:	03/14/2016
KHA PROJECT NO.	118133000

OFFSITE IMPROVEMENT PLAN

SHEET NUMBER
C2.4
COF# 6076

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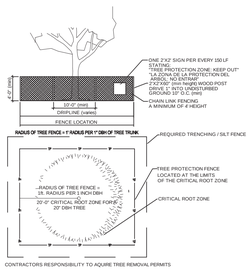
SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT: Address:	KIMLEY-HORN & ASSOCIATES 214 OCEANSIDE DRIVE NASHVILLE, TN 37204
Phone:	615-564-2701
Email:	RYAN.MCMASTER@KIMLEY-HORN.COM
Contact Name:	RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
BUILDING SQUARE FOOTAGE:	101,501 SF
PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
MINIMUM LANDSCAPE SURFACE RATIO:	0.30 (2.07 AC PHASE 1)
PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
PARKING PROVIDED:	149 TOTAL SPACES 145 STANDARD SPACES 4 ADA SPACES 0 COMPACT SPACES
EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:

1. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
2. THIS SITE PLAN HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN STANDARDS AND THE APPROVAL OF PLANNING COMMISSION. CHANGES SHALL NOT BE MADE TO THE APPROVED SITE PLAN UNLESS APPROVED BY EITHER RELEVANT DEPARTMENT SUPERINTENDENT OR THE PLANNING COMMISSION.
3. THE INFORMATION SHOWN ON THIS PLAN IS BASED UPON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIPZONE 4100 AND NAD 83 DATUM.
4. BASE INFORMATION WAS TAKEN FROM A TOPOGRAPHIC SURVEY PREPARED BY LITTLEJOHN, DATED MARCH 23, 2015. KIMLEY-HORN AND ASSOCIATES SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF THE BASE INFORMATION SHOWN.
5. THE CONSULTANT HAS FOUND NO EVIDENCE OF THE MINERAL RIGHTS OF THIS PROPERTY BEING TRANSFERRED TO ANY PARTY OTHER THAN THE OWNER.
6. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO BUILDINGS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006



TREE PROTECTION FENCING DETAIL
FOR SAVED TREES

NOTE
ALL TP FENCE SHALL BE INSTALLED PRIOR TO INSPECTIONS FOR GRADING PERMIT. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED OUTSIDE THE LIMITS OF TP.

TREE PROTECTION DETAIL
NOT TO SCALE

GRADING & DRAINAGE GENERAL NOTES:

1. GRADING PERMIT IS REQUIRED FOR ANY PROJECT DISTURBING MORE THAN 10,000 SF, ADDING MORE THAN 5,000 SF OF IMPERVIOUS SURFACE OR FOR ANY SITE GRADING REQUIRING STOCKPILING OF MATERIAL.
2. THE DEVELOPER SHALL PROVIDE THE NECESSARY LABOR AND SUPERVISION REQUIRED TO SUPPORT FIELD TESTING BY THE INDEPENDENT TESTING FIRM AND INSPECTIONS BY CITY OFFICIALS AT NO COST TO THE CITY. TEST REPORTS OF FIELD TESTING IF APPLICABLE SHALL BE SUBMITTED DIRECTLY TO THE STREET DEPARTMENT. DEFECTS DISCLOSED BY TESTS SHALL BE RECTIFIED.
3. AN AUTHORIZED REPRESENTATIVE OF THE CITY SHALL MAKE A FINAL INSPECTION OF THE PROJECT AFTER COMPLETION TO DETERMINE ACCEPTABILITY OF THE WORK AND FOR RELEASE OF PERFORMANCE BONDS IF REQUIRED. BEFORE THIS FINAL INSPECTION CAN BE MADE, THE ENGINEER RESPONSIBLE FOR THE PROJECT SHALL CERTIFY IN WRITING TO THE CITY ENGINEER THAT THE WORK HAS BEEN COMPLETED IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATION.
4. DRAINAGE FACILITIES INCLUDING, BUT NOT LIMITED TO, CULVERTS, DETENTION BASINS AND DITCHES, AS WELL AS THE ROADWAY SUB-GRADE, BASE STONE AND BINDER & SURFACE COARSE SHALL BE INSPECTED, TESTED AND GIVEN APPROVAL AT EACH STAGE OF INSTALLATION PRIOR TO PROCEEDING TO THE NEXT STAGE OF CONSTRUCTION. FINAL CONSTRUCTION INSPECTION FOR APPROVAL AND ACCEPTANCE OF STREETS AND DRAINAGE SYSTEMS WILL NOT BE GRANTED UNTIL ALL WORK HAS BEEN COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS.
5. LOCATING AND COORDINATION FOR THE RELOCATION OF EXISTING UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR. TENNESSEE'S ONE-CALL AND THE CITY OF FRANKLIN UTILITY LOCATION SERVICE SHALL BE UTILIZED IN ADDITION TO COORDINATION WITH LOCAL UTILITY OWNERS. THE CONTRACTOR SHALL AT ALL TIMES PROTECT EXISTING UTILITIES AND WILL BE RESPONSIBLE FOR COSTS DUE TO DAMAGE CAUSED TO ANY UTILITY LINES.

OUTFALL 1 GRADING AND DRAINAGE CHART

	ON-SITE	OFFSITE	TOTAL
TOTAL AREA	11.62	12.03	23.65
IMPERVIOUS AREA	2.67	0.38	3.05
DISTURBED AREA	9.02	0	9.02
RV VALUE	0.195	N/A	0.195
2-YEAR STORM FLOW RATE	3.86 CFS	22.37 CFS	26.23 CFS
5-YEAR STORM FLOW RATE	7.95 CFS	25.9 CFS	33.86 CFS
10-YEAR STORM FLOW RATE	11.22 CFS	28.79 CFS	40.01 CFS
25-YEAR STORM FLOW RATE	15.44 CFS	32.38 CFS	47.82 CFS
50-YEAR STORM FLOW RATE	18.41 CFS	35.28 CFS	53.69 CFS
100-YEAR STORM FLOW RATE	22.22 CFS	37.6 CFS	59.82 CFS

WATER QUALITY BMP NOTES:

WATER QUALITY BMPS SHALL NOT BE INSTALLED UNTIL BUILD OUT IS NEAR COMPLETION TO PREVENT CONSTRUCTION SEDIMENT FROM ENTERING WATER QUALITY BMPS. WATER QUALITY AREAS SHALL NOT BE USED AS SEDIMENT BASINS DURING CONSTRUCTION. INSTALLER'S OF WATER QUALITY BMP'S SHOULD FOLLOW ALL INSTALLATION GUIDELINES SET FORTH IN THE CITY OF FRANKLIN BMP MANUAL LOCATED ON THE CITY'S WEBSITE.

NOTE:

THERE SHALL BE NO MOWING, CLEARING, GRADING, CONSTRUCTION, STORAGE, OR DISTURBANCE OF VEGETATION IN RIPARIAN BUFFERS EXCEPT AS PERMITTED BY THE CITY ENGINEER, OR HIS DESIGNEE.

ALL TREE-PROTECTION FENCING SHALL BE IN PLACE PRIOR TO THE ISSUANCE OF A GRADING OR LAND DISTURBANCE PERMIT AND SHALL BE MAINTAINED IN GOOD WORKING ORDER UNTIL ALL CONSTRUCTION ACTIVITY IS COMPLETED. NO DISTURBANCE IS PERMITTED IN A TREE PRESERVATION AREA. ANY REQUIRED EROSION CONTROL MEASURES SHALL BE PLACED OUTSIDE OF ANY TREE PROTECTION FENCING.

GRAPHIC SCALE IN FEET
0 50 100 200

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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

RYAN McMASTER
TENNESSEE
REGISTERED
LANDSCAPE
ARCHITECT
106823
STATE OF TENNESSEE
4/5/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY: CJM
DRAWN BY: CJM
CHECKED BY: RLM
DATE: 03/14/2016
KHA PROJECT NO. 118133000

OVERALL GRADING AND DRAINAGE PLAN

SHEET NUMBER
C3.0

COF# 6076

Drawing name: K:\NSH_LDEV\118133000 - Carothers MOB\4-CADD\3-PlanSheets\C3.0 Grading & Drainage Plan - 118133000.dwg C3.0 Overall Grading And Drainage Plan Apr 07, 2016 10:23am by: yates.bateman

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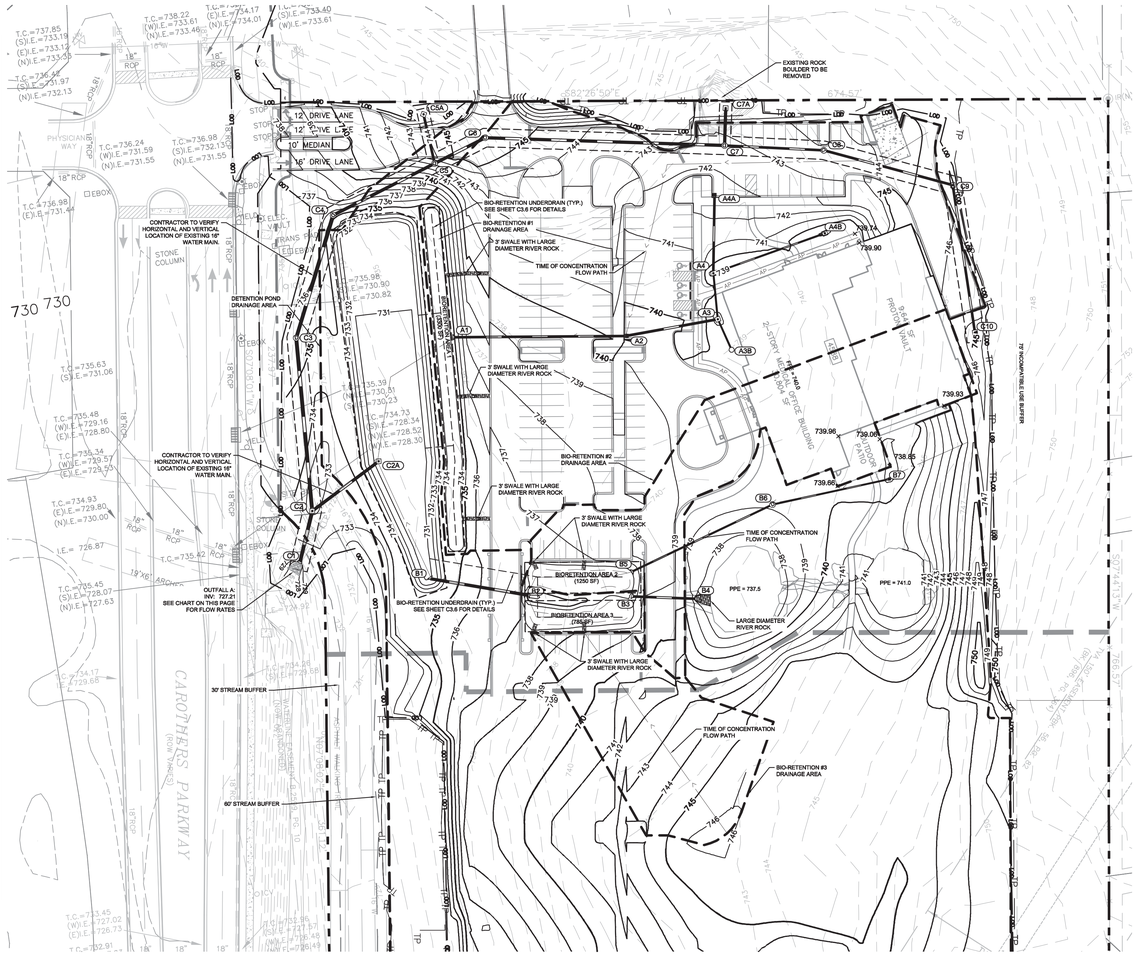
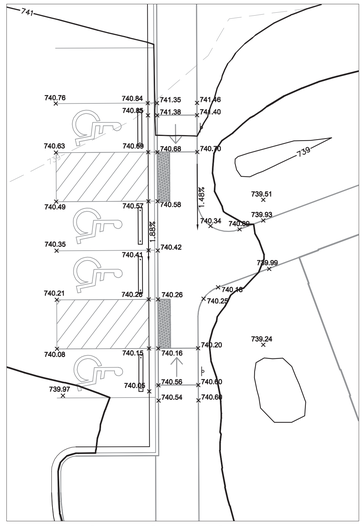
SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT: Address:	KIMLEY-HORN & ASSOCIATES 214 OCEANSIDE DRIVE NASHVILLE, TN 37204
Phone: Email: Contact Name:	615-564-2701 RYAN.MCMASTER@KIMLEY-HORN.COM RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
BUILDING SQUARE FOOTAGE:	101,501 SF
PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
MINIMUM LANDSCAPE SURFACE RATIO:	0.30 (2.07 AC PHASE 1)
PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
PARKING PROVIDED:	149 TOTAL SPACES 145 STANDARD SPACES 4 ADA SPACES 0 COMPACT SPACES
EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:

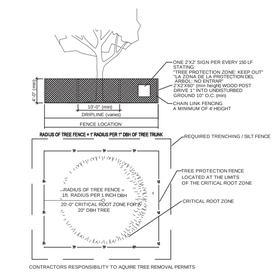
1. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
2. THIS SITE PLAN HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN STANDARDS AND THE APPROVAL OF PLANNING COMMISSION. CHANGES SHALL NOT BE MADE TO THE APPROVED SITE PLAN UNLESS APPROVED BY EITHER RELEVANT DEPARTMENT SUPERINTENDENT OR THE PLANNING COMMISSION.
3. THE INFORMATION SHOWN ON THIS PLAN IS BASED UPON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIPZONE 4100 AND NAD 83 DATUM.
4. BASE INFORMATION WAS TAKEN FROM A TOPOGRAPHIC SURVEY PREPARED BY LITTLEJOHN, DATED MARCH 23, 2015. KIMLEY-HORN AND ASSOCIATES SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF THE BASE INFORMATION SHOWN.
5. THE CONSULTANT HAS FOUND NO EVIDENCE OF THE MINERAL RIGHTS OF THIS PROPERTY BEING TRANSFERRED TO ANY PARTY OTHER THAN THE OWNER.
6. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO BUILDINGS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006





GRADING ENLARGEMENT

SCALE 1" = 10'



TREE PROTECTION FENCING DETAIL
FOR SAVED TREES

NOTE
ALL TP FENCE SHALL BE INSTALLED PRIOR TO INSPECTIONS FOR GRADING PERMIT. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED OUTSIDE THE LIMITS OF TP.

TREE PROTECTION DETAIL
NOT TO SCALE

STRUCTURE TABLE		
NAME	DESCRIPTION	TOP GRATE
A1	HEADWALL	N/A
A2	CURB INLET	739.55
A3	CATCH BASIN	738.51
A3B	JUNCTION BOX	740.00
A4	CATCH BASIN	738.83
A4A	CURB INLET	742.21
A4B	CATCH BASIN	738.92
B1	HEADWALL	N/A
B2	HEADWALL	N/A
B3	HEADWALL	N/A
B4	HEADWALL	N/A
B5	HEADWALL	N/A
B6	JUNCTION BOX	739.16
B7	CATCH BASIN	738.52
C1	HEADWALL	N/A
C2	CATCH BASIN	732.26
C2A	OUTLET STRUCTURE	733.50
C3	JUNCTION BOX	735.62
C4	JUNCTION BOX	735.00
C5	JUNCTION BOX	743.29

STRUCTURE TABLE		
NAME	DESCRIPTION	TOP GRATE
C5A	AREA DRAIN	743.05
C6	JUNCTION BOX	745.34
C7	JUNCTION BOX	742.77
C7A	CATCH BASIN	742.50
C8	JUNCTION BOX	743.80
C9	AREA DRAIN	744.82
C10	AREA DRAIN	744.97

PIPE TABLE					
NAME	UPSTREAM	DOWNSTREAM	SIZE	LENGTH	SLOPE	MATERIAL
A2 - A1	734.84 (A2)	734.00 (A1)	18"	140'	0.60%	RCP
A3 - A2	735.46 (A3)	735.04 (A2)	18"	77'	0.55%	RCP
A3B - A3	736.98 (A3B)	735.65 (A3)	12"	28'	4.88%	HDPE
A4 - A3	735.83 (A4)	735.65 (A3)	12"	38'	0.49%	HDPE
A4A - A4	740.50 (A4A)	736.03 (A4)	18"	64'	7.07%	RCP
A4B - A4	736.53 (A4B)	736.03 (A4)	12"	97'	0.52%	HDPE
B2 - B1	733.80 (B2)	731.00 (B1)	24"	81'	3.49%	RCP
B4 - B3	736.41 (B4)	735.90 (B3)	18"	51'	1.02%	RCP
B6 - B5	735.93 (B6)	735.30 (B5)	12"	126'	0.50%	HDPE
B7 - B6	736.52 (B7)	736.03 (B6)	12"	98'	0.50%	RCP
C2 - C1	727.42 (C2)	727.21 (C1)	30"	43'	0.50%	RCP
C2A - C2	728.38 (C2A)	727.82 (C2)	24"	68'	1.12%	RCP
C3 - C2	728.33 (C3)	727.82 (C2)	30"	142'	0.50%	RCP
C4 - C3	728.98 (C4)	728.46 (C3)	30"	105'	0.50%	RCP
C5 - C4	733.60 (C5)	729.15 (C4)	24"	93'	4.79%	RCP
C5A - C5	736.00 (C5A)	733.80 (C5)	18"	42'	5.36%	RCP
C6 - C5	735.80 (C6)	734.00 (C5)	24"	47'	3.88%	RCP
C7 - C6	738.02 (C7)	736.00 (C6)	24"	196'	1.04%	RCP
C7A - C7	739.75 (C7A)	738.22 (C7)	24"	31'	5.00%	RCP
C8 - C7	739.00 (C8)	738.22 (C7)	18"	81'	0.97%	RCP
C9 - C8	740.28 (C9)	739.20 (C8)	18"	109'	0.99%	RCP
C10 - C9	741.50 (C10)	740.48 (C9)	18"	122'	0.84%	RCP

OUTFALL A GRADING AND DRAINAGE CHART

	ON-SITE	OFFSITE	TOTAL
TOTAL AREA	11.62	12.03	23.65
IMPERVIOUS AREA	2.67	0.38	3.05
DISTURBED AREA	9.02	0	9.02
RV VALUE	0.195	N/A	0.195
2-YEAR STORM FLOW RATE	3.86 CFS	22.37 CFS	26.23 CFS
5-YEAR STORM FLOW RATE	7.95 CFS	25.9 CFS	33.86 CFS
10-YEAR STORM FLOW RATE	11.22 CFS	28.79 CFS	40.01 CFS
25-YEAR STORM FLOW RATE	15.44 CFS	32.38 CFS	47.82 CFS
50-YEAR STORM FLOW RATE	18.41 CFS	35.28 CFS	53.69 CFS
100-YEAR STORM FLOW RATE	22.22 CFS	37.6 CFS	59.82 CFS

GRADING & DRAINAGE GENERAL NOTES:

1. GRADING PERMIT IS REQUIRED FOR ANY PROJECT DISTURBING MORE THAN 10,000 SF, ADDING MORE THAN 5,000 SF OF IMPERVIOUS SURFACE OR FOR ANY SITE GRADING REQUIRING STOCKPILING OF MATERIAL.
2. THE DEVELOPER SHALL PROVIDE THE NECESSARY LABOR AND SUPERVISION REQUIRED TO SUPPORT FIELD TESTING BY THE INDEPENDENT TESTING FIRM AND INSPECTIONS BY CITY OFFICIALS AT NO COST TO THE CITY. TEST REPORTS OF FIELD TESTING IF APPLICABLE SHALL BE SUBMITTED DIRECTLY TO THE STREET DEPARTMENT. DEFECTS DISCLOSED BY TESTS SHALL BE RECTIFIED.
3. AN AUTHORIZED REPRESENTATIVE OF THE CITY SHALL MAKE A FINAL INSPECTION OF THE PROJECT AFTER COMPLETION TO DETERMINE ACCEPTABILITY OF THE WORK AND FOR RELEASE OF PERFORMANCE BONDS IF REQUIRED. BEFORE THIS FINAL INSPECTION CAN BE MADE, THE ENGINEER RESPONSIBLE FOR THE PROJECT SHALL CERTIFY IN WRITING TO THE CITY ENGINEER THAT THE WORK HAS BEEN COMPLETED IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATION.
4. DRAINAGE FACILITIES INCLUDING, BUT NOT LIMITED TO, CULVERTS, DETENTION BASINS AND DITCHES, AS WELL AS THE ROADWAY SUB-GRADE, BASE STONE AND BINDER & SURFACE COARSE SHALL BE INSPECTED, TESTED AND GIVEN APPROVAL AT EACH STAGE OF INSTALLATION PRIOR TO PROCEEDING TO THE NEXT STAGE OF CONSTRUCTION. FINAL CONSTRUCTION INSPECTION FOR APPROVAL AND ACCEPTANCE OF STREETS AND DRAINAGE SYSTEMS WILL NOT BE GRANTED UNTIL ALL WORK HAS BEEN COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS.
5. LOCATING AND COORDINATION FOR THE RELOCATION OF EXISTING UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR. TENNESSEE'S ONE-CALL AND THE CITY OF FRANKLIN UTILITY LOCATION SERVICE SHALL BE UTILIZED IN ADDITION TO COORDINATION WITH LOCAL UTILITY OWNERS. THE CONTRACTOR SHALL AT ALL TIMES PROTECT EXISTING UTILITIES AND WILL BE RESPONSIBLE FOR COSTS DUE TO DAMAGE CAUSED TO ANY UTILITY LINES. CONTRACTOR TO VERIFY ELEVATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER IMMEDIATELY OF ANY CONFLICTS.

NOTE:

THE DETENTION POND IS DESIGNED TO HANDLE PHASE 1 AND FUTURE PHASE 2 IMPERVIOUS AREAS.

BIO-RETENTION #3 IS DESIGNED TO HANDLE PHASE 1 AND 13,000 SF OF IMPERVIOUS PHASE 2 AREA.

ALL TREE-PROTECTION FENCING SHALL BE IN PLACE PRIOR TO THE ISSUANCE OF A GRADING OR LAND DISTURBANCE PERMIT AND SHALL BE MAINTAINED IN GOOD WORKING ORDER UNTIL ALL CONSTRUCTION ACTIVITY IS COMPLETED. NO DISTURBANCE IS PERMITTED IN A TREE PRESERVATION AREA. ANY REQUIRED EROSION CONTROL MEASURES SHALL BE PLACED OUTSIDE OF ANY TREE PROTECTION FENCING.

WATER QUALITY BMP NOTES:

WATER QUALITY BMPS SHALL NOT BE INSTALLED UNTIL BUILD OUT IS NEAR COMPLETION TO PREVENT CONSTRUCTION SEDIMENT FROM ENTERING WATER QUALITY BMPS. WATER QUALITY AREAS SHALL NOT BE USED AS SEDIMENT BASINS DURING CONSTRUCTION. INSTALLER'S OF WATER QUALITY BMP'S SHOULD FOLLOW ALL INSTALLATION GUIDELINES SET FORTH IN THE CITY OF FRANKLIN BMP MANUAL LOCATED ON THE CITY'S WEBSITE.

NOTE:

THERE SHALL BE NO MOWING, CLEARING, GRADING, CONSTRUCTION, STORAGE, OR DISTURBANCE OF VEGETATION IN RIPARIAN BUFFERS EXCEPT AS PERMITTED BY THE CITY ENGINEER, OR HIS DESIGNEE.

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

Kimley»Horn
214 Oceanside Drive
Nashville, TN 37204
Main: 615.564.2701
www.kimley-horn.com
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER
TENNESSEE
REGISTERED
LANDSCAPE
ARCHITECT
No. 100005
STATE OF TENNESSEE

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY: CJM
DRAWN BY: CJM
CHECKED BY: RLM
DATE: 03/14/2016

KHA PROJECT NO.
118133000

ENLARGED GRADING AND DRAINAGE PLAN

SHEET NUMBER
C3.1

COF# 6076

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT:	KIMLEY-HORN & ASSOCIATES
Address:	214 OCEANSIDE DRIVE NASHVILLE, TN 37204
Phone:	615-564-2701
Email:	RYAN.MCMASTER@KIMLEY-HORN.COM
Contact Name:	RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
BUILDING SQUARE FOOTAGE:	101,501 SF
PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
MINIMUM LANDSCAPE SURFACE RATIO:	0.30 (2.07 AC PHASE 1)
PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
PARKING PROVIDED:	149 TOTAL SPACES 145 STANDARD SPACES 4 ADA SPACES 0 COMPACT SPACES
EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:

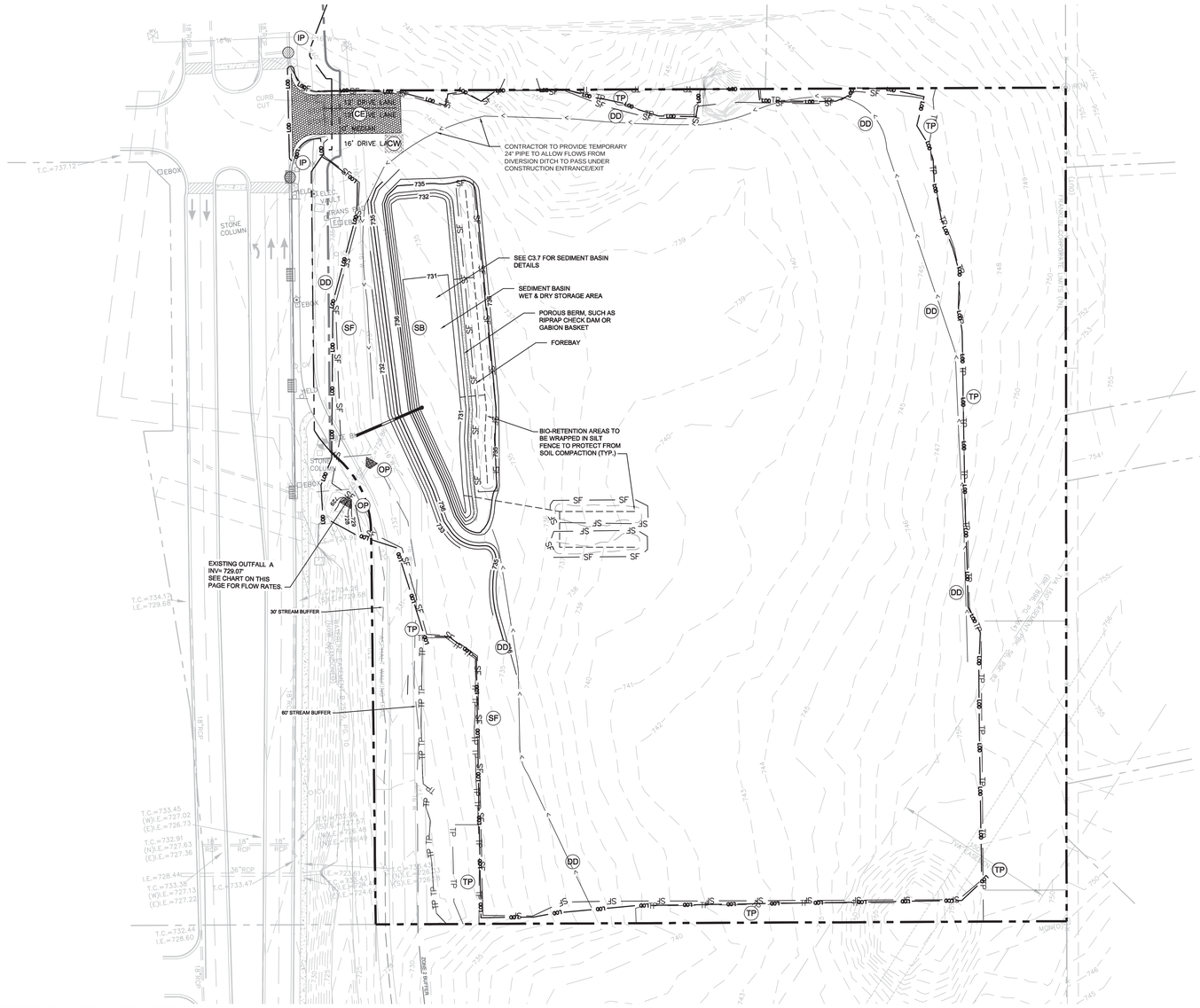
1. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
2. THIS SITE PLAN HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN STANDARDS AND THE APPROVAL OF PLANNING COMMISSION. CHANGES SHALL NOT BE MADE TO THE APPROVED SITE PLAN UNLESS APPROVED BY EITHER RELEVANT DEPARTMENT SUPERINTENDENT OR THE PLANNING COMMISSION.
3. THE INFORMATION SHOWN ON THIS PLAN IS BASED UPON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIPZONE 4100 AND NAD 83 DATUM.
4. BASE INFORMATION WAS TAKEN FROM A TOPOGRAPHIC SURVEY PREPARED BY LITTLEJOHN, DATED MARCH 23, 2015. KIMLEY-HORN AND ASSOCIATES SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF THE BASE INFORMATION SHOWN.
5. THE CONSULTANT HAS FOUND NO EVIDENCE OF THE MINERAL RIGHTS OF THIS PROPERTY BEING TRANSFERRED TO ANY PARTY OTHER THAN THE OWNER.
6. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO BUILDINGS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006

EROSION CONTROL MEASURES LEGEND

- IP — INLET PROTECTION - REFER TO DETAIL SHEET C3.5
- OP — OUTLET PROTECTION - REFER TO DETAIL SHEET C3.5
- SF — SILT FENCE - REFER TO DETAIL SHEET C3.5
- TP — TREE PROTECTION - REFER TO DETAIL SHEET C3.5
- CW — DESIGNATED CONCRETE WASHOUT AREA - REFER TO DETAIL SHEET C3.5
- MA — EROSION CONTROL MATTING - REFER TO DETAIL SHEET C3.5. CONTRACTOR TO INSTALL ON SLOPES 3(H):1(V) OR STEEPER
- CE — CONSTRUCTION EXIT - REFER TO DETAIL SHEET C3.5
- TS — TEMPORARY STABILIZATION
- PS — PERMANENT STABILIZATION
- DD — DIVERSION DITCH - REFER TO DETAIL SHEET C3.5
- SB — SEDIMENT BASIN - REFER TO DETAIL SHEET C3.7
- LIMITS OF DISTURBANCE REQUIRED FOR CONSTRUCTION

SITE EROSION CONTROL NOTES:

1. SEE SHEETS C0.1 AND C0.2 FOR GENERAL AND SPECIAL NOTES REGARDING DEMOLITION, CONSTRUCTION, AND EROSION PREVENTION AND SEDIMENT CONTROL.
2. SEE SHEET C3.5 FOR ADDITIONAL EROSION CONTROL NOTES AND DETAILS.
3. THE EPSC MEASURES USED AT THIS SITE ARE DESIGNED TO CONTROL THE STORM RUNOFF GENERATED BY A 5-YR, 24-HOUR STORM EVENT
4. THERE SHALL BE NO MOWING, CLEARING, GRADING, CONSTRUCTION, STORAGE, OR DISTURBANCE OF VEGETATION IN RIPARIAN BUFFERS EXCEPT AS PERMITTED BY THE CITY ENGINEER, OR HIS DESIGNEE.



BIORETENTION CELL OR WATER QUALITY SWALE CONSTRUCTION SEQUENCING

1. CONTRACTOR IS TO PROVIDE METHOD OF DIVERTING RUNOFF FLOW AROUND THE CONSTRUCTION OF THE BIORETENTION AREA DURING PERIODS OF RAINFALL TO ENSURE SEDIMENT DOES NOT ENTER BIORETENTION AREA
2. EXCAVATE BIORETENTION AREA. EXCAVATORS OR BACKHOES SHOULD WORK FROM THE SIDES TO EXCAVATE THE BIORETENTION AREA TO THE DESIGN DEPTH AND DIMENSIONS. EXCAVATING EQUIPMENT SHOULD HAVE SCOOPS WITH ADEQUATE REACH SO THEY DO NOT SIT INSIDE THE FOOTPRINT OF THE BIORETENTION AREA
3. SCARIFY SUBGRADE BY RIPPING THE BOTTOM SOILS TO A DEPTH OF 12 INCHES PRIOR TO STONE PLACEMENT
4. **CALL CITY OF FRANKLIN INSPECTOR FOR INSPECTION 615-791-3218**
5. INSTALL WASHED STONE LAYER. INSTALL UNDERDRAIN PIPES AND CONNECT TO THE OUTLET STRUCTURE. INSTALL ADDITIONAL STONE ON THE UNDERDRAIN PIPES AS PER THE BIORETENTION SECTION DETAIL. CONTRACTOR TO FLAG THE UNDERDRAIN LOCATIONS (3 FT EACH SIDE) AS THE ADDITIONAL SECTIONS ARE BEING INSTALLED. A SMALL BOBCAT LOADER IS TO BE USED FOR PLACEMENT OF ADDITIONAL SECTIONS AND IS TO AVOID ACCESSING THE AREAS OF THE UNDERDRAIN PIPE INSTALLATION TO PREVENT DAMAGE TO THE PERFORATED PIPE.
6. INSTALL PERMEABLE GEOTEXTILE FABRIC.
7. DELIVER THE SOIL MEDIA AND STORE IT ON PLASTIC SHEETING WITH THE APPROPRIATE EROSION CONTROL MEASURES ON THE DOWNHILL AND BIORETENTION SIDES.
8. CALL CITY OF FRANKLIN INSPECTOR FOR INSPECTION 615-791-3218
9. INSTALL THE SOIL MEDIA IN 12" LIFTS UNTIL THE DESIRED TOP ELEVATION IS ACHIEVED. WAIT A FEW DAYS TO CHECK FOR SETTLEMENT AND ADD ADDITIONAL MEDIA AS NEEDED TO ACHIEVE THE DESIGN ELEVATIONS. DO NOT COMPACT WITH EQUIPMENT.
10. PREPARE PLANTING HOLES FOR ANY TREES AND SHRUBS, INSTALL THE VEGETATION AND WATER ACCORDINGLY
11. INSTALL SPECIFIED GROUNDCOVER IN BOTTOM OF BIORETENTION AREA
12. SOD SLOPES
13. CONTRACTOR TO FLAG LIMITS OF BIORETENTION BASIN FOR SURVEY TO LOCATE AND SHOW ON ASBUILT PLANS.

WATER QUALITY BMP NOTES:

WATER QUALITY BMPS SHALL NOT BE INSTALLED UNTIL BUILD OUT IS NEAR COMPLETION TO PREVENT CONSTRUCTION SEDIMENT FROM ENTERING WATER QUALITY BMPS. WATER QUALITY AREAS SHALL NOT BE USED AS SEDIMENT BASINS DURING CONSTRUCTION. INSTALLER'S OF WATER QUALITY BMP'S SHOULD FOLLOW ALL INSTALLATION GUIDELINES SET FORTH IN THE CITY OF FRANKLIN BMP MANUAL LOCATED ON THE CITY'S WEBSITE.

EPSC PHASE 1 CONSTRUCTION SEQUENCE:

1. INSTALL CONSTRUCTION ENTRANCE/EXIT AND CONCRETE WASHOUT
2. INSTALL SILT FENCE AND TREE PROTECTION.
3. INSTALL SEDIMENT BASIN.
4. CONTRACTOR TO CONTACT ENGINEERING DEPARTMENT TO OBTAIN STORMWATER PERMIT. THE CONTRACTOR SHALL CONTACT APPROPRIATE PARTY FOR INSPECTION OF EROSION CONTROL DEVICES AND TO OBTAIN FULL GRADING PERMIT.

EPSC GENERAL NOTES:

1. SEDIMENT SHALL BE REMOVED FROM SILT FENCE WHEN REACHES 1/3 THE HEIGHT OF THE FENCE; SEDIMENT SHALL BE REMOVED FROM ALL OTHER EPSC MEASURES AND CONTROL AS RECOMMENDED IN THE TNEPSC HANDBOOK, AND MUST BE REMOVED WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50%
2. EPSCS SHALL BE IMPLEMENTED BEFORE EARTH-MOVING BEGINS.
3. AREAS WHERE CONSTRUCTION HAS TEMPORARILY/PERMANENTLY CEASED SHALL BE STABILIZED WITHIN 15 DAYS (7 DAYS FOR ≥35% SLOPES).
4. INSPECTIONS OF OUTFALLS/EPSC MEASURES SHALL BE CONDUCTED AT LEAST TWICE WEEKLY AND AT LEAST 72 HOURS APART.
5. VEGETATION, EPSCS & OTHER PROTECTIVE MEASURES SHALL BE REPAIRED, REPLACED, OR MODIFIED WITHIN 7 DAYS OF BEING NOTIFIED OF AN ISSUE.
6. CONSTRUCTION SHALL BE PHASED FOR ACTIVITIES THAT WILL DISTURB >50 ACRES.
7. EPSCS SHALL BE DESIGNED TO CONTROL THE RAINFALL AND RUNOFF FROM A 5-YEAR, 24-HOUR RETURN INTERVAL STORM.
8. TEMPORARY SEDIMENT BASIN(S) SHALL BE PROVIDED FOR ON-SITE OUTFALLS THAT RECEIVE DRAINAGE FROM ≥10 ACRES.
9. GREEN INFRASTRUCTURE BMPS SHALL BE PROTECTED DURING SITE WORK, WITH SILT FENCE, TO PREVENT SEDIMENTATION AND COMPACTION.

PROPOSED OUTFALL A GRADING AND DRAINAGE CHART

	ON-SITE	OFFSITE	TOTAL
TOTAL AREA	11.62	12.03	23.65
IMPERVIOUS AREA	2.67	0.38	3.05
DISTURBED AREA	9.02	0	9.02
RV VALUE	0.195	N/A	0.195
2-YEAR STORM FLOW RATE	3.86 CFS	22.37 CFS	26.23 CFS
5-YEAR STORM FLOW RATE	7.95 CFS	25.9 CFS	33.86 CFS
10-YEAR STORM FLOW RATE	11.22 CFS	28.79 CFS	40.01 CFS
25-YEAR STORM FLOW RATE	15.44 CFS	32.38 CFS	47.82 CFS
50-YEAR STORM FLOW RATE	18.41 CFS	35.28 CFS	53.69 CFS
100-YEAR STORM FLOW RATE	22.22 CFS	37.6 CFS	59.82 CFS

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

Kimley»Horn
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

RYAN McMASTER — 108182 — REGISTERED LANDSCAPE ARCHITECT — STATE OF TENNESSEE — 4/5/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY: CJM
DRAWN BY: CJM
CHECKED BY: RLM
DATE: 03/14/2016
KHA PROJECT NO. 118133000

INITIAL EPSC / PRE CONSTRUCTION PLAN

SHEET NUMBER
C3.2
COF# 6076

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT: Address:	KIMLEY-HORN & ASSOCIATES 214 OCEANSIDE DRIVE NASHVILLE, TN 37204
Phone: Email: Contact Name:	615-564-2701 RYAN.MCMASTER@KIMLEY-HORN.COM RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
BUILDING SQUARE FOOTAGE:	101,501 SF
PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
MINIMUM LANDSCAPE SURFACE RATIO:	0.30 (2.07 AC PHASE 1)
PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
PARKING PROVIDED:	149 TOTAL SPACES 145 STANDARD SPACES 4 ADA SPACES 0 COMPACT SPACES
EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:

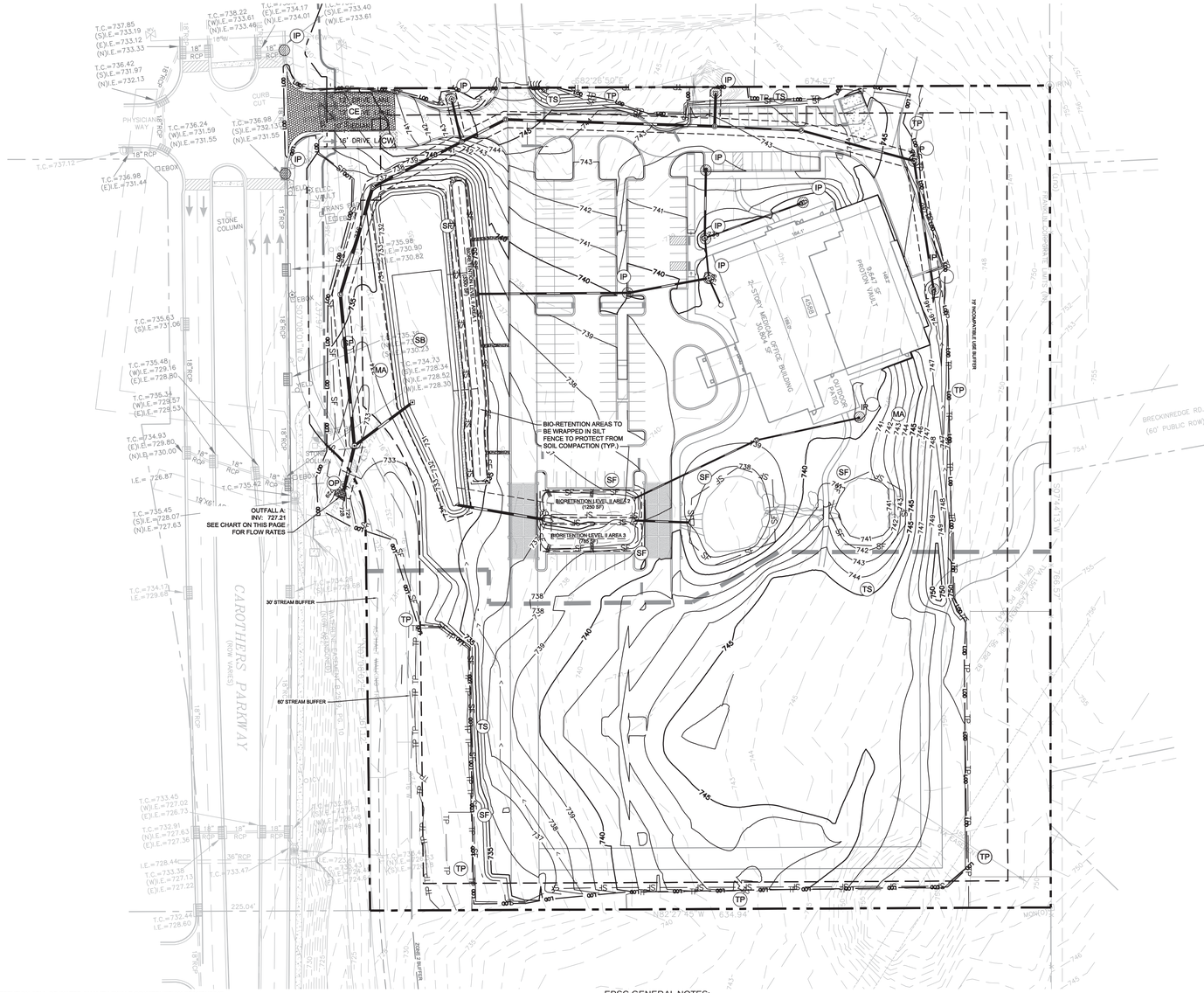
1. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
2. THIS SITE PLAN HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN STANDARDS AND THE APPROVAL OF PLANNING COMMISSION. CHANGES SHALL NOT BE MADE TO THE APPROVED SITE PLAN UNLESS APPROVED BY EITHER RELEVANT DEPARTMENT SUPERINTENDENT OR THE PLANNING COMMISSION.
3. THE INFORMATION SHOWN ON THIS PLAN IS BASED UPON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIPZONE 4100 AND NAD 83 DATUM.
4. BASE INFORMATION WAS TAKEN FROM A TOPOGRAPHIC SURVEY PREPARED BY LITTLEJOHN, DATED MARCH 23, 2015. KIMLEY-HORN AND ASSOCIATES SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF THE BASE INFORMATION SHOWN.
5. THE CONSULTANT HAS FOUND NO EVIDENCE OF THE MINERAL RIGHTS OF THIS PROPERTY BEING TRANSFERRED TO ANY PARTY OTHER THAN THE OWNER.
6. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO BUILDINGS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006

EROSION CONTROL MEASURES LEGEND

IP	INLET PROTECTION - REFER TO DETAIL SHEET C3.5
OP	OUTLET PROTECTION - REFER TO DETAIL SHEET C3.5
SF	SILT FENCE - REFER TO DETAIL SHEET C3.5
TP	TREE PROTECTION - REFER TO DETAIL SHEET C3.5
CW	DESIGNATED CONCRETE WASHOUT AREA - REFER TO DETAIL SHEET C3.5
MA	EROSION CONTROL MATTING - REFER TO DETAIL SHEET C3.5. CONTRACTOR TO INSTALL ON SLOPES 3(H):1(V) OR STEEPER
CE	CONSTRUCTION EXIT - REFER TO DETAIL SHEET C3.5
TS	TEMPORARY STABILIZATION
PS	PERMANENT STABILIZATION
DD	DIVERSION DITCH - REFER TO DETAIL SHEET C3.5
SB	SEDIMENT BASIN - REFER TO DETAIL SHEET C3.7
	LIMITS OF DISTURBANCE REQUIRED FOR CONSTRUCTION

SITE EROSION CONTROL NOTES:

1. SEE SHEETS C0.1 AND C0.2 FOR GENERAL AND SPECIAL NOTES REGARDING DEMOLITION, CONSTRUCTION, AND EROSION PREVENTION AND SEDIMENT CONTROL.
2. SEE SHEET C3.5 FOR ADDITIONAL EROSION CONTROL NOTES AND DETAILS.
3. THE EPSC MEASURES USED AT THIS SITE ARE DESIGNED TO CONTROL THE STORM RUNOFF GENERATED BY A 5-YR, 24-HOUR STORM EVENT
4. THERE SHALL BE NO MOWING, CLEARING, GRADING, CONSTRUCTION, STORAGE, OR DISTURBANCE OF VEGETATION IN RIPARIAN BUFFERS EXCEPT AS PERMITTED BY THE CITY ENGINEER, OR HIS DESIGNEE.



BIORETENTION CELL OR WATER QUALITY SWALE CONSTRUCTION SEQUENCING

1. CONTRACTOR IS TO PROVIDE METHOD OF DIVERTING RUNOFF FLOW AROUND THE CONSTRUCTION OF THE BIORETENTION AREA DURING PERIODS OF RAINFALL TO ENSURE SEDIMENT DOES NOT ENTER BIORETENTION AREA
2. EXCAVATE BIORETENTION AREA. EXCAVATORS OR BACKHOES SHOULD WORK FROM THE SIDES TO EXCAVATE THE BIORETENTION AREA TO THE DESIGN DEPTH AND DIMENSIONS. EXCAVATING EQUIPMENT SHOULD HAVE SCOOPS WITH ADEQUATE REACH SO THEY DO NOT SIT INSIDE THE FOOTPRINT OF THE BIORETENTION AREA
3. SCARIFY SUBGRADE BY RIPPING THE BOTTOM SOILS TO A DEPTH OF 12 INCHES PRIOR TO STONE PLACEMENT
4. **CALL CITY OF FRANKLIN INSPECTOR FOR INSPECTION 615-791-3218**
5. INSTALL WASHED STONE LAYER. INSTALL UNDERDRAIN PIPES AND CONNECT TO THE OUTLET STRUCTURE. INSTALL ADDITIONAL STONE ON THE UNDERDRAIN PIPES AS PER THE BIORETENTION SECTION DETAIL. CONTRACTOR TO FLAG THE UNDERDRAIN LOCATIONS (3 FT EACH SIDE) AS THE ADDITIONAL SECTIONS ARE BEING INSTALLED. A SMALL BOBCAT LOADER IS TO BE USED FOR PLACEMENT OF ADDITIONAL SECTIONS AND IS TO AVOID ACCESSING THE AREAS OF THE UNDERDRAIN PIPE INSTALLATION TO PREVENT DAMAGE TO THE PERFORATED PIPE.
6. INSTALL PERMEABLE GEOTEXTILE FABRIC.
7. DELIVER THE SOIL MEDIA AND STORE IT ON PLASTIC SHEETING WITH THE APPROPRIATE EROSION CONTROL MEASURES ON THE DOWNHILL AND BIORETENTION SIDES.
8. CALL CITY OF FRANKLIN INSPECTOR FOR INSPECTION 615-791-3218
9. INSTALL THE SOIL MEDIA IN 12" LIFTS UNTIL THE DESIRED TOP ELEVATION IS ACHIEVED. WAIT A FEW DAYS TO CHECK FOR SETTLEMENT AND ADD ADDITIONAL MEDIA AS NEEDED TO ACHIEVE THE DESIGN ELEVATIONS. DO NOT COMPACT WITH EQUIPMENT.
10. PREPARE PLANTING HOLES FOR ANY TREES AND SHRUBS. INSTALL THE VEGETATION AND WATER ACCORDINGLY
11. INSTALL SPECIFIED GROUNDCOVER IN BOTTOM OF BIORETENTION AREA
12. SOD SLOPES
13. CONTRACTOR TO FLAG LIMITS OF BIORETENTION BASIN FOR SURVEY TO LOCATE AND SHOW ON ASBUILT PLANS.

WATER QUALITY BMP NOTES:

1. WATER QUALITY BMPS SHALL NOT BE INSTALLED UNTIL BUILD OUT IS NEAR COMPLETION TO PREVENT CONSTRUCTION SEDIMENT FROM ENTERING WATER QUALITY BMPS. WATER QUALITY AREAS SHALL NOT BE USED AS SEDIMENT BASINS DURING CONSTRUCTION. INSTALLER'S OF WATER QUALITY BMP'S SHOULD FOLLOW ALL INSTALLATION GUIDELINES SET FORTH IN THE CITY OF FRANKLIN BMP MANUAL LOCATED ON THE CITY'S WEBSITE.
2. CONTRACTOR SHALL PROVIDE NECESSARY PROTECTION FOR ALL GIP'S FROM COMPACTION.
3. SEDIMENT BASIN NOT REQUIRED BECAUSE OF DRAINAGE AREA BEING LESS THAN 10 ACRES. (8.49 ACRES)

EPSC PHASE 2 CONSTRUCTION SEQUENCE:

1. CONTRACTOR TO BEGIN CLEARING, GRUBBING, AND EXCAVATING.
2. INSTALL PROPOSED UTILITIES INCLUDING PROPOSED INLETS WITH PROTECTION.
3. CLEAR, GRUB, AND GRADE REMAINING SITE.
4. CONSTRUCT REMAINING SITE ACCORDING TO THE APPROVED PLANS, OR AS INSTRUCTED BY THE EROSION CONTROL INSPECTOR.

EPSC GENERAL NOTES:

1. SEDIMENT SHALL BE REMOVED FROM SILT FENCE WHEN REACHES 1/3 THE HEIGHT OF THE FENCE; SEDIMENT SHALL BE REMOVED FROM ALL OTHER EPSC MEASURES AND CONTROL AS RECOMMENDED IN THE TNEPSC HANDBOOK, AND MUST BE REMOVED WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50%
2. EPSCS SHALL BE IMPLEMENTED BEFORE EARTH-MOVING BEGINS.
3. AREAS WHERE CONSTRUCTION HAS TEMPORARILY/PERMANENTLY CEASED SHALL BE STABILIZED WITHIN 15 DAYS (7 DAYS FOR ≥35% SLOPES).
4. INSPECTIONS OF OUTFALLS/EPSC MEASURES SHALL BE CONDUCTED AT LEAST TWICE WEEKLY AND AT LEAST 72 HOURS APART.
5. VEGETATION, EPSCS & OTHER PROTECTIVE MEASURES SHALL BE REPAIRED, REPLACED, OR MODIFIED WITHIN 7 DAYS OF BEING NOTIFIED OF AN ISSUE.
6. CONSTRUCTION SHALL BE PHASED FOR ACTIVITIES THAT WILL DISTURB >50 ACRES.
7. EPSCS SHALL BE DESIGNED TO CONTROL THE RAINFALL AND RUNOFF FROM A 5-YEAR, 24-HOUR RETURN INTERVAL STORM.
8. TEMPORARY SEDIMENT BASIN(S) SHALL BE PROVIDED FOR ON-SITE OUTFALLS THAT RECEIVE DRAINAGE FROM ≥10 ACRES.
9. GREEN INFRASTRUCTURE BMPS SHALL BE PROTECTED DURING SITE WORK, WITH SILT FENCE, TO PREVENT SEDIMENTATION AND COMPACTION.

PROPOSED OUTFALL A GRADING AND DRAINAGE CHART

	ON-SITE	OFFSITE	TOTAL
TOTAL AREA	11.62	12.03	23.65
IMPERVIOUS AREA	2.67	0.38	3.05
DISTURBED AREA	9.02	0	9.02
RV VALUE	0.195	N/A	0.195
2-YEAR STORM FLOW RATE	3.86 CFS	22.37 CFS	26.23 CFS
5-YEAR STORM FLOW RATE	7.95 CFS	25.9 CFS	33.86 CFS
10-YEAR STORM FLOW RATE	11.22 CFS	28.79 CFS	40.01 CFS
25-YEAR STORM FLOW RATE	15.44 CFS	32.38 CFS	47.82 CFS
50-YEAR STORM FLOW RATE	18.41 CFS	35.28 CFS	53.69 CFS
100-YEAR STORM FLOW RATE	22.22 CFS	37.6 CFS	59.82 CFS

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

Kimley»Horn
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Nashville, TN 37204
Main: 615.564.2701
www.kimley-horn.com
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

BRYAN McMASTER TENNESSEE REGISTERED LANDSCAPE ARCHITECT 108193 STATE OF TENNESSEE 4/5/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY: CJM
DRAWN BY: CJM
CHECKED BY: RLM
DATE: 03/14/2016
KHA PROJECT NO. 118133000

INTERIM EPSC / CONSTRUCTION PLAN

SHEET NUMBER
C3.3
COF# 6076

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SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT: Address: Phone: Email: Contact Name:	KIMLEY-HORN & ASSOCIATES 214 OCEANSIDE DRIVE NASHVILLE, TN 37204 615-564-2701 RYAN.MCMASTER@KIMLEY-HORN.COM RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
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PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
MINIMUM LANDSCAPE SURFACE RATIO:	0.30 (2.07 AC PHASE 1)
PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
PARKING PROVIDED:	149 TOTAL SPACES 145 STANDARD SPACES 4 ADA SPACES 0 COMPACT SPACES
EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:
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6. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO BUILDINGS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006

EROSION CONTROL MEASURES LEGEND

	IP	INLET PROTECTION - REFER TO DETAIL SHEET C3.5
	OP	OUTLET PROTECTION - REFER TO DETAIL SHEET C3.5
SF	SF	SILT FENCE - REFER TO DETAIL SHEET C3.5
TP	TP	TREE PROTECTION - REFER TO DETAIL SHEET C3.5
	CW	DESIGNATED CONCRETE WASHOUT AREA - REFER TO DETAIL SHEET C3.5
	MA	EROSION CONTROL MATTING - REFER TO DETAIL SHEET C3.5. CONTRACTOR TO INSTALL ON SLOPES 3(H):1(V) OR STEEPER
	CE	CONSTRUCTION EXIT - REFER TO DETAIL SHEET C3.5
	TS	TEMPORARY STABILIZATION
	PS	PERMANENT STABILIZATION
	DD	DIVERSION DITCH - REFER TO DETAIL SHEET C3.5
	SB	SEDIMENT BASIN - REFER TO DETAIL SHEET C3.7
		LIMITS OF DISTURBANCE REQUIRED FOR CONSTRUCTION

SITE EROSION CONTROL NOTES:
1. SEE SHEETS C0.1 AND C0.2 FOR GENERAL AND SPECIAL NOTES REGARDING DEMOLITION, CONSTRUCTION, AND EROSION PREVENTION AND SEDIMENT CONTROL.
2. SEE SHEET C3.5 FOR ADDITIONAL EROSION CONTROL NOTES AND DETAILS.
3. THE EPSC MEASURES USED AT THIS SITE ARE DESIGNED TO CONTROL THE STORM RUNOFF GENERATED BY A 5-YR, 24-HOUR STORM EVENT.
4. THERE SHALL BE NO MOWING, CLEARING, GRADING, CONSTRUCTION, STORAGE, OR DISTURBANCE OF VEGETATION IN RIPARIAN BUFFERS EXCEPT AS PERMITTED BY THE CITY ENGINEER, OR HIS DESIGNEE

EPSC PHASE 3 CONSTRUCTION SEQUENCE:

1. PERMANENTLY STABILIZE SITE.
2. UPON PERMANENT SITE STABILIZATION, REMOVE SILT FENCE, TREE PROTECTION, AND ALL OTHER TEMPORARY EROSION CONTROL DEVICES.
3. REMOVE SEDIMENT FROM SEDIMENT BASIN AND CONVERT TO DETENTION POND, AS SHOWN ON THESE PLANS.
4. FINISH INSTALLING PERMANENT STORMWATER BMP'S SHOWN ON THIS PLAN PER THE CITY OF FRANKLIN BMP MANUAL.

WATER QUALITY

STORMWATER WATER QUALITY REQUIREMENTS ARE USING LOW IMPACT DEVELOPMENT STRATEGIES AS OUTLINED IN COF STORMWATER BMP MANUAL. BIORETENTION AREAS ARE BEING USED TO INFILTRATE, EVAPORATE, AND TRANSPIRATE THE FIRST INCH OF RAINFALL RUNOFF, RESULTING IN A COMPOSITE RUNOFF REDUCTION COEFFICIENT OF LESS THAN 0.2.

WATER QUALITY SIGNS SHALL BE PLACED WITHIN THE WATER QUALITY AREAS. THE SIGNS, MATERIALS, AND LABOR TO INSTALL WILL BE PROVIDED BY CITY STAFF. THESE SIGNS WILL BE 9 X 12 MOUNTED ON GALVANIZED POST. THEY WILL PROVIDE IDENTIFICATION, EDUCATION, AND MAINTENANCE REMINDERS TO THE OWNER OF THE WATER QUALITY FEATURES ONSITE.

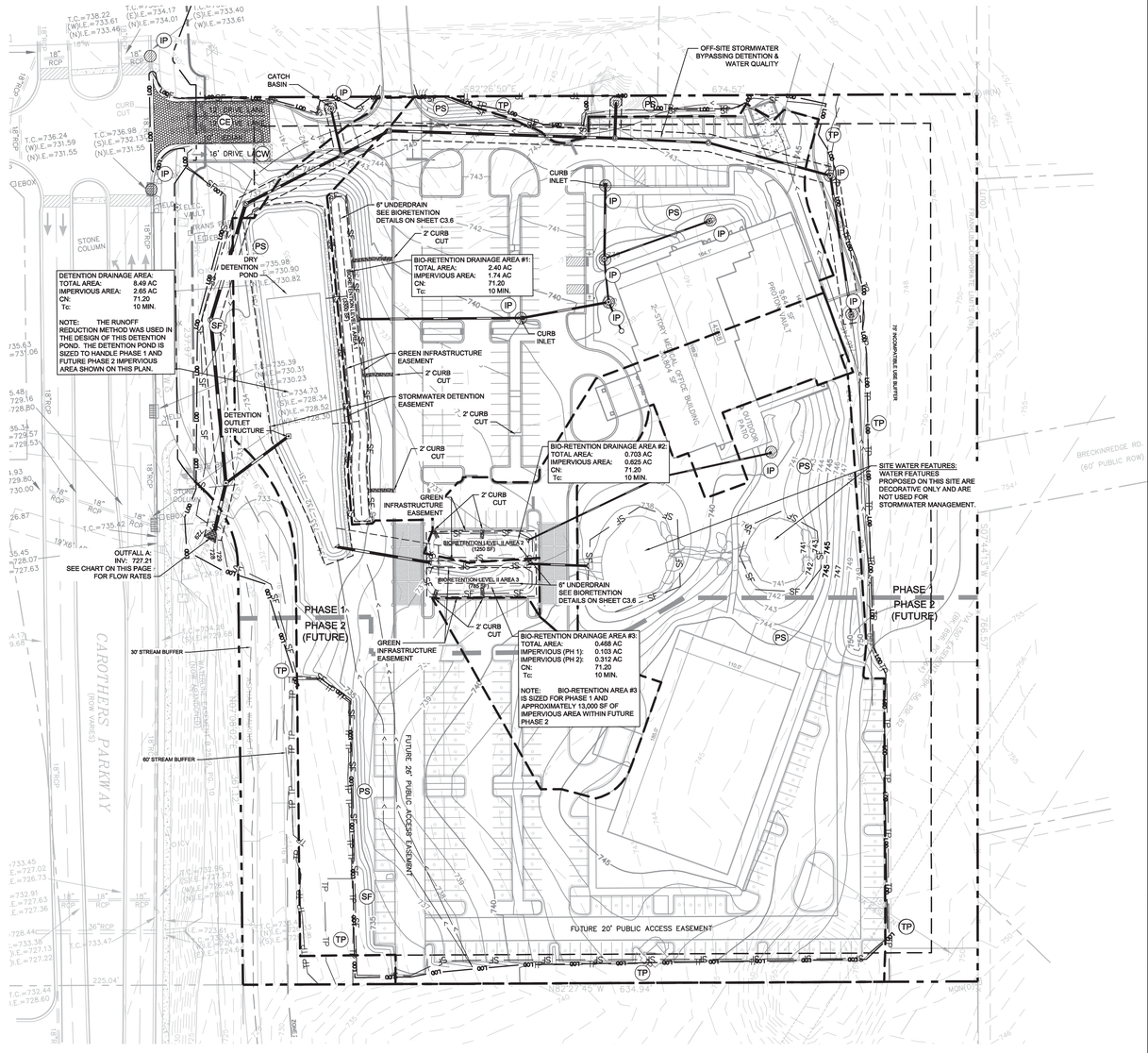
WATER QUALITY BMP NOTES:

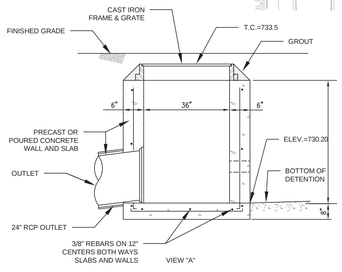
WATER QUALITY BMPS SHALL NOT BE INSTALLED UNTIL BUILD OUT IS NEAR COMPLETION TO PREVENT CONSTRUCTION SEDIMENT FROM ENTERING WATER QUALITY BMPS. WATER QUALITY AREAS SHALL NOT BE USED AS SEDIMENT BASINS DURING CONSTRUCTION. INSTALLER'S OF WATER QUALITY BMP'S SHOULD FOLLOW ALL INSTALLATION GUIDELINES SET FORTH IN THE CITY OF FRANKLIN BMP MANUAL LOCATED ON THE CITY'S WEBSITE.

ALL TREE-PROTECTION FENCING SHALL BE IN PLACE PRIOR TO THE ISSUANCE OF A GRADING OR LAND DISTURBANCE PERMIT AND SHALL BE MAINTAINED IN GOOD WORKING ORDER UNTIL ALL CONSTRUCTION ACTIVITY IS COMPLETED. NO DISTURBANCE IS PERMITTED IN A TREE PRESERVATION AREA. ANY REQUIRED EROSION CONTROL MEASURES SHALL BE PLACED OUTSIDE OF ANY TREE PROTECTION FENCING.

BIORETENTION CELL OR WATER QUALITY SWALE CONSTRUCTION SEQUENCING

1. CONTRACTOR IS TO PROVIDE METHOD OF DIVERTING RUNOFF FLOW AROUND THE CONSTRUCTION OF THE BIORETENTION AREA DURING PERIODS OF RAINFALL TO ENSURE SEDIMENT DOES NOT ENTER BIORETENTION AREA
2. EXCAVATE BIORETENTION AREA. EXCAVATORS OR BACKHOES SHOULD WORK FROM THE SIDES TO EXCAVATE THE BIORETENTION AREA TO THE DESIGN DEPTH AND DIMENSIONS. EXCAVATING EQUIPMENT SHOULD HAVE SCOOPS WITH ADEQUATE REACH SO THEY DO NOT SIT INSIDE THE FOOTPRINT OF THE BIORETENTION AREA
3. SCARIFY SUBGRADE BY RIPPING THE BOTTOM SOILS TO A DEPTH OF 12 INCHES PRIOR TO STONE PLACEMENT
4. **CALL CITY OF FRANKLIN INSPECTOR FOR INSPECTION 615-791-3218**
5. INSTALL WASHED STONE LAYER. INSTALL UNDERDRAIN PIPES AND CONNECT TO THE OUTLET STRUCTURE. INSTALL ADDITIONAL STONE ON THE UNDERDRAIN PIPES AS PER THE BIORETENTION SECTION DETAIL. CONTRACTOR TO FLAG THE UNDERDRAIN LOCATIONS (3 FT EACH SIDE) AS THE ADDITIONAL SECTIONS ARE BEING INSTALLED. A SMALL BOBCAT LOADER IS TO BE USED FOR PLACEMENT OF ADDITIONAL SECTIONS AND IS TO AVOID ACCESSING THE AREAS OF THE UNDERDRAIN PIPE INSTALLATION TO PREVENT DAMAGE TO THE PERFORATED PIPE.
6. INSTALL PERMEABLE GEOTEXTILE FABRIC.
7. DELIVER THE SOIL MEDIA AND STORE IT ON PLASTIC SHEETING WITH THE APPROPRIATE EROSION CONTROL MEASURES ON THE DOWNHILL AND BIORETENTION SIDES.
8. CALL CITY OF FRANKLIN INSPECTOR FOR INSPECTION 615-791-3218
9. INSTALL THE SOIL MEDIA IN 12" LIFTS UNTIL THE DESIRED TOP ELEVATION IS ACHIEVED. WAIT A FEW DAYS TO CHECK FOR SETTLEMENT AND ADD ADDITIONAL MEDIA AS NEEDED TO ACHIEVE THE DESIGN ELEVATIONS. DO NOT COMPACT WITH EQUIPMENT.
10. PREPARE PLANTING HOLES FOR ANY TREES AND SHRUBS, INSTALL THE VEGETATION AND WATER ACCORDINGLY
11. INSTALL SPECIFIED GROUNDCOVER IN BOTTOM OF BIORETENTION AREA
12. SOD SLOPES
13. CONTRACTOR TO FLAG LIMITS OF BIORETENTION BASIN FOR SURVEY TO LOCATE AND SHOW ON ASBUILT PLANS.





DETENTION OUTLET CONTROL STRUCTURE

PROPOSED OUTFALL A GRADING AND DRAINAGE CHART

	ON-SITE	OFFSITE	TOTAL
TOTAL AREA	11.62	12.03	23.65
IMPERVIOUS AREA	2.67	0.38	3.05
DISTURBED AREA	9.02	0	9.02
RV VALUE	0.195	N/A	0.195
2-YEAR STORM FLOW RATE	3.86 CFS	22.37 CFS	26.23 CFS
5-YEAR STORM FLOW RATE	7.95 CFS	25.9 CFS	33.86 CFS
10-YEAR STORM FLOW RATE	11.22 CFS	28.79 CFS	40.01 CFS
25-YEAR STORM FLOW RATE	15.44 CFS	32.38 CFS	47.82 CFS
50-YEAR STORM FLOW RATE	18.41 CFS	35.28 CFS	53.69 CFS
100-YEAR STORM FLOW RATE	22.22 CFS	37.6 CFS	59.82 CFS

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

Kimley»Horn
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Nashville, TN 37204
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

RYAN McMASTER LICENSED LANDSCAPE ARCHITECT STATE OF TENNESSEE 109025 4/1/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

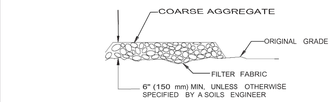
DESIGNED BY:	CJM
DRAWN BY:	CJM
CHECKED BY:	RLM
DATE:	03/14/2016
KHA PROJECT NO.	118133000

FINAL EPSC / WATER QUALITY PLAN

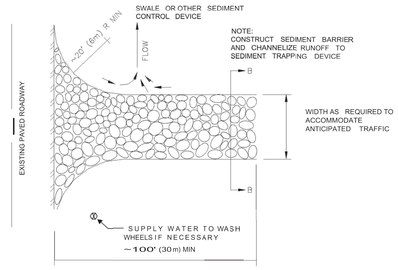
SHEET NUMBER
C3.4
COF# 6076

Drawing name: K:\NSH_LDEV\118133000 - Carothers MOB\4-CADD\3-PlanSheets\C3.2 EPSC - 118133000.dwg C3.4 Final EPSC - Water Quality Plan Apr 07, 2016 10:25am by: yates.bateman

ACTIVITY: Stabilized Construction Entrance — TCP- 01



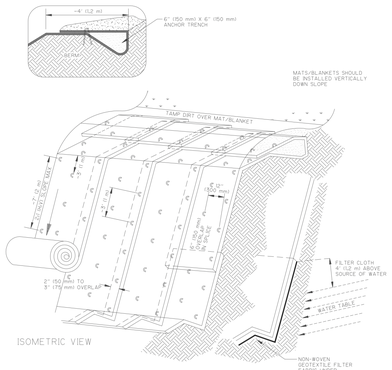
SECTION B-B
N.T.S.



PLAN VIEW
N.T.S.

1 CONSTRUCTION ENTRANCE
SCALE:
Figure TCP-01-1
Stabilized Construction Entrance

ACTIVITY: Geotextiles — PESC – 02



ISOMETRIC VIEW

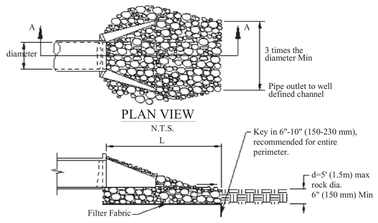
TYPICAL SLOPE SOIL STABLIZATION
N.T.S.

WET SLOPE LINING
N.T.S.

NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, SOIL CLODS, STICKS AND GRASS, MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

2 EROSION CONTROL LINING
SCALE:
Figure PESC-02-2
Anchoring Geotextiles on Embankments

ACTIVITY: Outlet Protection — PESC – 07

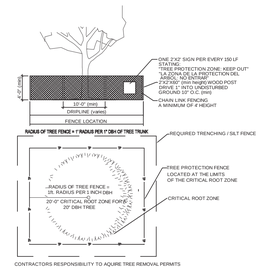


Adapted from: Virginia Erosion & Sediment Control Handbook, 1992

Pipe Diameter in (mm)	Discharge ft ³/s (m ³ /s)	Apron Length, L ft (m)	Rip-Rap D_{50} Diameter Min in (mm)
12 (300)	4.9 (0.14)	10 (3)	4 (100)
	9.89 (0.28)	13 (4)	6 (150)
18 (450)	9.89 (0.28)	10 (3)	6 (150)
	20.13 (0.57)	16 (5)	8 (200)
	30.01 (0.85)	23 (7)	12 (300)
	39.90 (1.13)	26 (8)	16 (400)
24 (600)	30.01 (0.85)	16 (5)	8 (200)
	39.90 (1.13)	26 (8)	8 (200)
	50.14 (1.42)	26 (8)	12 (300)
	60.03 (1.70)	30 (9)	16 (400)
For larger or higher flows, consult a registered civil engineer			

Source: Adapted from USDA-SCS

3 OUTLET PROTECTION
SCALE:
Figure PESC-07-1
Outlet Protection Sizing



TREE PROTECTION FENCING DETAIL FOR 18" SAVED TREES

TREE PROTECTION NOTES:
1. The tree protection barriers shall be constructed before the issuance of any permits, and shall remain intact throughout the entire period of construction.

2. The tree protection barrier shall be installed as labeled on this plan or a distance to the radius of the dripline, whichever is greatest, as measured from the trunk of the protected tree.

3. Any required excavation in or around the protection zone to accommodate underground services, footings, etc. shall be indicated on the plan, and shall be excavated by hand. In addition, related root pruning shall be accomplished via ANSI A-300-95 standard so as to minimize impact on the general root system.

4. The storage of building materials or stock piling shall not be permitted within the limits of or against the protection barriers.

5. Trees within the protection barriers must be adequately cared for throughout the construction process (i.e., they must be watered sufficiently). Fill shall not be placed upon the root system as to endanger the health or life of the affected tree.

NOTE
ALL TP FENCE SHALL BE INSTALLED PRIOR TO INSPECTIONS FOR GRADING PERMIT. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED OUTSIDE THE LIMITS OF TP.

4 TREE PROTECTION FENCING DETAIL
SCALE:

SECTION A–A
NOT TO SCALE

CONCRETE WASHOUT SIGN (OR EQUIVALENT)

SECTION B–B
NOT TO SCALE

PLAN VIEW
NOT TO SCALE

TYPE "BELOW GRADE"

6 CONCRETE WASHOUT
SCALE:

NOTES:
1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. SIGNAGE IDENTIFYING THE CONCRETE WASHOUT AREA SHALL BE INSTALLED WITHIN 5FT.OF THE WASHOUT FACILITY.

PLAN VIEW
NOT TO SCALE

TYPE "ABOVE GRADE" WITH EATHERN BERMS

POSTS: STEEL EITHER T OR U
FABRIC:
1. AMOCO 1198
2. BELTECH 810
3. MIRAFI 130X
4. LING GTF 190
5. SI 915 SC

1. GEOTEXTILE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
2. WHEN TWO SECTIONS OF GEOTEXTILE ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
3. MAINTENANCE SHALL BE PERFORMED AS NOTED IN THE EROSION CONTROL PLAN. COLLECTED MATERIAL SHALL BE REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE OR WHEN CAPACITY NEARS 50%.

5 SILT FENCE
SCALE:

7 INLET PROTECTION
SCALE:

DIVERSION BERM

DIVERSION CHANNEL WITH BERM

8 DIVERSION DITCH
SCALE:

EROSION CONTROL PLAN LEGEND: TD DIVERSION

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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON
PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

RYAN McMASTER
REGISTERED
LANDSCAPE ARCHITECT
No. 108025
STATE OF TENNESSEE
4/1/16

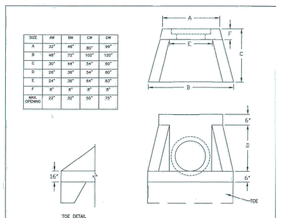
No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY: RJA
DRAWN BY: RJA
CHECKED BY: RLM
DATE: 03/14/2016
KHA PROJECT NO. 118133000

GRADING, DRAINAGE AND EPSC DETAILS

SHEET NUMBER
C3.5
COF# 6076

Drawing name: K:\NSH_LDEV\118133000 - Carothers MOB\4-CADD\3-PlanSheets\C3.2 EPSC - 118133000.dwg C3.5 Grading Drainage and EPSC Details Apr 07, 2016 10:26am by: yates.bateman



SIZE	A#	B#	C#	D#
A	30"	48"	80"	99"
B	48"	72"	110"	133"
C	30"	42"	54"	95"
D	24"	28"	54"	80"
E	24"	30"	64"	93"
F	6"	7"	8"	8"
MAX OPENING	23"	35"	35"	75"

GENERAL NOTES
1. MINIMUM REINFORCING WIRE REINFORCEMENT 4X4 W1.4XW1.4
2. f'_c = 4,000 PSI
3. fy = 60 ksi
4. SHERMANDIXIE DW@ E1-200 OR APPROVED EQUAL

N.T.S

CITY OF FRANKLIN

REINFORCED CONCRETE ENDWALL

DWG. NO.SD-05 DATE: 02/17/2011 DIRECTOR OF ENGINEERING

DRAINAGE STRUCTURES, MANHOLES, GRATES, PIPE CULVERTS AND ENDWALLS

TYPE	TDOT STANDARD DRAWINGS
CATCH BASINS	TDOT CATCH BASINS 1C, 12, 13, 14, 16 AND 17 TYPE
CATCH BASINS GRATES	D-CBB-124 AND D-CBB-13 (SEE NOTE 1 AND 2 BELOW)
AREA DRAINS — 1 GRATE	D-CB-42 SERIES
AREA DRAINS — 2 GRATES	D-CB-43 SERIES
AREA DRAIN GRATES	D-CBB-42
JUNCTION BOX	D-JBS-1 THRU D-JBS-5
MANHOLES	D-MH-2 THRU DRT-1
TRENCH DRAINS	D-TD-1
PROTECTED ENDWALLS	D-PE1 THRU D-PE-3F
PIPE CULVERTS AND FLUMES	D-FLU-1, D-PB-1 THRU D-PB-3

NOTES
1. USE OF ROLLOVER CURB & GUTTER SHALL BE USED WITH A NEW R-3501-TR, R-3501-TL TYPE "L" GRATE WITH ENVIRONOTEC PLATES R-3000-C SURFACE MOUNT OR APPROVED EQUAL.
2. USE OF 24" CURB AND GUTTER SECTION SHALL BE USED WITH A NEMA R-3067 TYPE "L" GRATE WITH ENVIRONOTEC PLATES R-3000-C SURFACE MOUNT.
3. INLETS, DRAINS, GRATES, MANHOLES AND ENDWALLS TO BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE TDOT STANDARD DRAWINGS

N.T.S

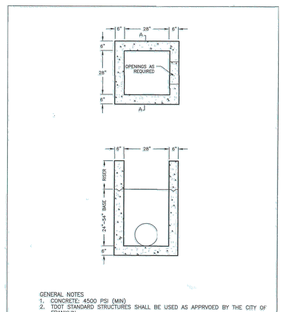
CITY OF FRANKLIN

DRAINAGE STRUCTURES, MANHOLES, GRATES AND ENDWALLS

DWG. NO. D-1 EFFECTIVE DATE: 01/08/2013

CITY ENGINEER DATE

DIRECTOR OF ENGINEERING DATE



GENERAL NOTES
1. CONCRETE: 4500 PSI (MIN)
2. TDOT STANDARD STRUCTURES SHALL BE USED AS APPROVED BY THE CITY OF FRANKLIN
3. ADD BRICK ADJUSTMENT COURSES AS NECESSARY (2 COURSE MAX).

N.T.S

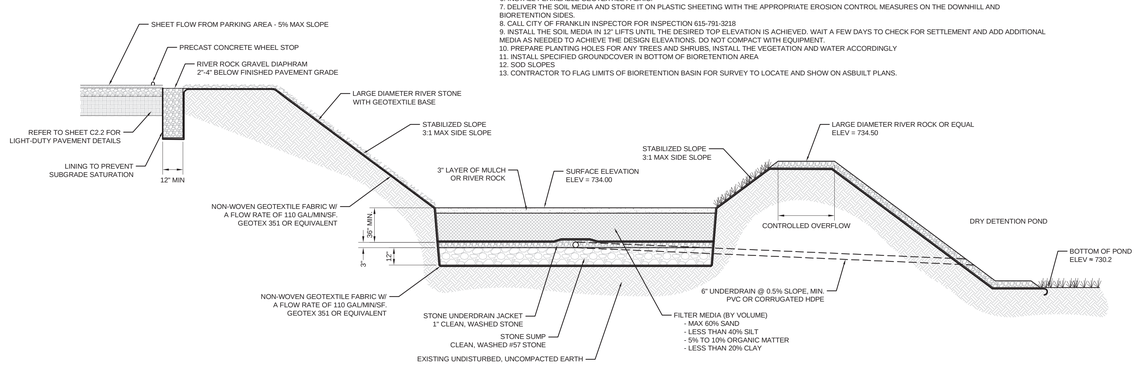
CITY OF FRANKLIN

PRE-CAST 28"X 28" SINGLE CATCH BASIN

DWG. NO.SD-02 DATE: 02/17/2011 DIRECTOR OF ENGINEERING

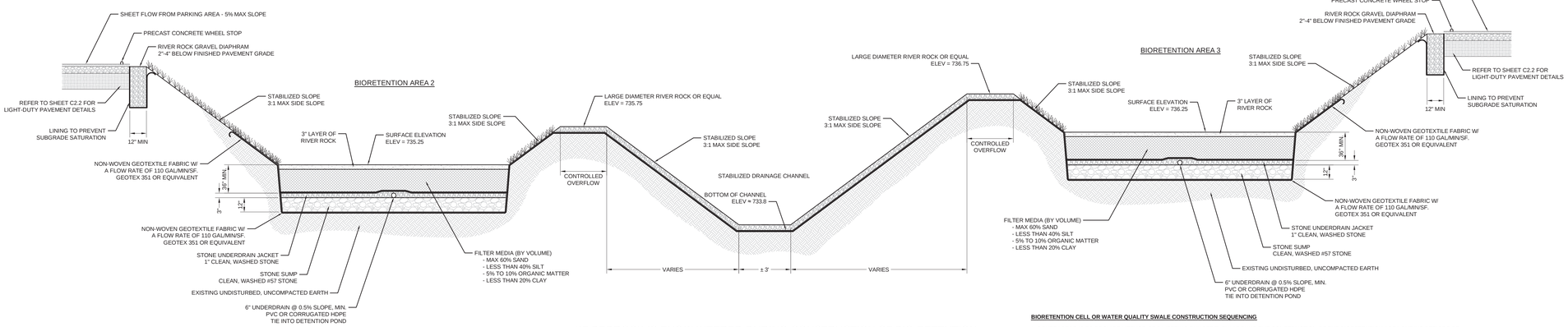
BIORETENTION CELL OR WATER QUALITY SWALE CONSTRUCTION SEQUENCING

1. CONTRACTOR IS TO PROVIDE METHOD OF DIVERTING RUNOFF FLOW AROUND THE CONSTRUCTION OF THE BIORETENTION AREA DURING PERIODS OF RAINFALL TO ENSURE SEDIMENT DOES NOT ENTER BIORETENTION AREA
2. EXCAVATE BIORETENTION AREA. EXCAVATORS OR BACKHOES SHOULD WORK FROM THE SIDES TO EXCAVATE THE BIORETENTION AREA TO THE DESIGN DEPTH AND DIMENSIONS. EXCAVATING EQUIPMENT SHOULD HAVE SCOOPS WITH ADEQUATE REACH SO THEY DO NOT SIT INSIDE THE FOOTPRINT OF THE BIORETENTION AREA
3. SCARIFY SUBGRADE BY RIPPING THE BOTTOM SOILS TO A DEPTH OF 12 INCHES PRIOR TO STONE PLACEMENT
4. **CALL CITY OF FRANKLIN INSPECTOR FOR INSPECTION 615-791-3218**
5. INSTALL WASHED STONE LAYER. INSTALL UNDERDRAIN PIPES AND CONNECT TO THE OUTLET STRUCTURE. INSTALL ADDITIONAL STONE ON THE UNDERDRAIN PIPES AS PER THE BIORETENTION SECTION DETAIL. CONTRACTOR TO FLAG THE UNDERDRAIN LOCATIONS (3 FT EACH SIDE) AS THE ADDITIONAL SECTIONS ARE BEING INSTALLED. A SMALL BOBCAT LOADER IS TO BE USED FOR PLACEMENT OF ADDITIONAL SECTIONS AND IS TO AVOID ACCESSING THE AREAS OF THE UNDERDRAIN PIPE INSTALLATION TO PREVENT DAMAGE TO THE PERFORATED PIPE.
6. INSTALL PERMEABLE GEOTEXTILE FABRIC.
7. DELIVER THE SOIL MEDIA AND STORE IT ON PLASTIC SHEETING WITH THE APPROPRIATE EROSION CONTROL MEASURES ON THE DOWNHILL AND BIORETENTION SIDES.
8. CALL CITY OF FRANKLIN INSPECTOR FOR INSPECTION 615-791-3218
9. INSTALL THE SOIL MEDIA IN 12" LIFTS UNTIL THE DESIRED TOP ELEVATION IS ACHIEVED. WAIT A FEW DAYS TO CHECK FOR SETTLEMENT AND ADD ADDITIONAL MEDIA AS NEEDED TO ACHIEVE THE DESIGN ELEVATIONS. DO NOT COMPACT WITH EQUIPMENT.
10. PREPARE PLANTING HOLES FOR ANY TREES AND SHRUBS, INSTALL THE VEGETATION AND WATER ACCORDINGLY
11. INSTALL SPECIFIED GROUNDCOVER IN BOTTOM OF BIORETENTION AREA
12. SOD SLOPES
13. CONTRACTOR TO FLAG LIMITS OF BIORETENTION BASIN FOR SURVEY TO LOCATE AND SHOW ON ASBUILT PLANS.



1 BIORETENTION AREA 1
LEVEL 2 BIORETENTION
SCALE:

*IF BEDROCK IS ENCOUNTERED DURING CONSTRUCTION OF BIO-RETENTION AREAS, BEDROCK MUST BE EXCAVATED TO AN ELEVATION OF 12" MINIMUM BELOW THE BOTTOM OF THE PROPOSED BIO-RETENTION SECTION.



2 BIORETENTION AREAS 2 & 3
LEVEL 2 BIORETENTION
SCALE:

*IF BEDROCK IS ENCOUNTERED DURING CONSTRUCTION OF BIO-RETENTION AREAS, BEDROCK MUST BE EXCAVATED TO AN ELEVATION OF 12" MINIMUM BELOW THE BOTTOM OF THE PROPOSED BIO-RETENTION SECTION.

BIORETENTION CELL OR WATER QUALITY SWALE CONSTRUCTION SEQUENCING

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www.kimley-horn.com
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER REGISTERED LANDSCAPE ARCHITECT NO. 108032 STATE OF TENNESSEE

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	RJA
DRAWN BY:	RJA
CHECKED BY:	RLM
DATE:	03/14/2016

KHA PROJECT NO. 118133000

GRADING, DRAINAGE AND EPSC DETAILS

SHEET NUMBER

C3.6

COF# 6076

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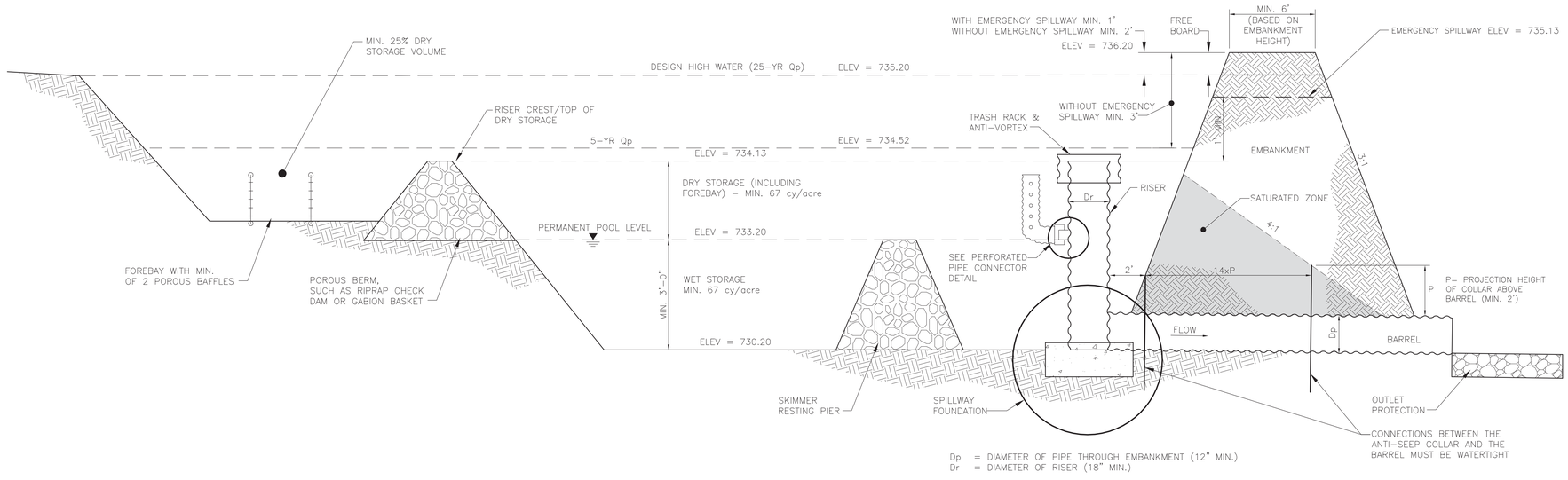
Drawing name: K:\NSH_LDEV\118133000 - Carothers MOB\4-CADD\3-PlanSheets\C3.2 EPSC - 118133000.dwg C3.6 Grading Drainage and EPSC Details Apr 07, 2016 10:26am by: yates.bateman



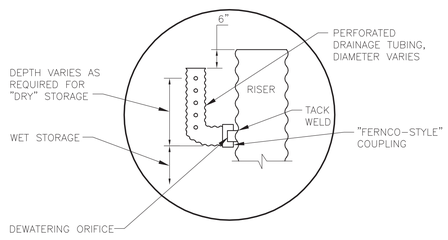
BASIN SCHEDULE

FACILITY	RISER PIPE DIA. (IN.)	BARREL PIPE DIA. (IN.)	PERMANENT POOL ELEVATION	PRINCIPAL SPILLWAY ELEVATION FEET, AMSL	EMERGENCY SPILLWAY ELEVATION FEET, AMSL	EMERGENCY SPILLWAY WIDTH	EMERGENCY SPILLWAY SIDESLOPE	TOP OF EMBANKMENT ELEVATION FEET, AMSL	BOTTOM OF BASIN ELEVATION FEET, AMSL
BASIN 1	18"	24"	733.20	734.13	735.13	6'	3H:1V	736.20	730.20

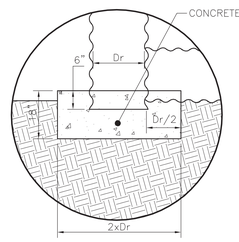
PERFORATED PIPE DEWATERING DEVICE SPECIFICATIONS

FACILITY	PIPE DIAMETER	INLET ELEVATION	NUMBER OF SLOTS/HOLES
BASIN 1	6"	733.20	4

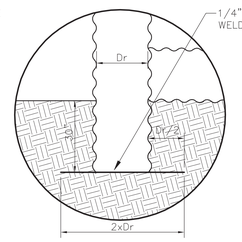
DEWATERING DEVICE
PERFORATED VERTICAL
PIPE OR TUBING



SPILLWAY FOUNDATIONS
FOR RISER HEIGHTS <10'



CONCRETE BASE FOR EMBANKMENT
10 OR LESS IN HEIGHT



STEEL BASE FOR EMBANKMENT
10 OR LESS IN HEIGHT

1 SEDIMENT BASIN
SCALE:

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GAMBLE
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DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON
PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

RYAN McMASTER REGISTERED ENGINEER 108982 STATE OF TENNESSEE 4/1/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	RJA
DRAWN BY:	RJA
CHECKED BY:	RLM
DATE:	03/14/2016
KHA PROJECT NO.	118133000

GRADING, DRAINAGE AND EPSC DETAILS

SHEET NUMBER
C3.7
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SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT:	KIMLEY-HORN & ASSOCIATES
Address:	214 OCEANSIDE DRIVE NASHVILLE, TN 37204
Phone:	615-564-2701
Email:	RYAN.MCMASTER@KIMLEY-HORN.COM
Contact Name:	RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
BUILDING SQUARE FOOTAGE:	101,501 SF
PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
MINIMUM LANDSCAPE SURFACE RATIO:	0.30 (2.07 AC PHASE 1)
PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
PARKING PROVIDED:	149 TOTAL SPACES 145 STANDARD SPACES 4 ADA SPACES 0 COMPACT SPACES
EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:

1. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
2. THIS SITE PLAN HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN STANDARDS AND THE APPROVAL OF PLANNING COMMISSION. CHANGES SHALL NOT BE MADE TO THE APPROVED SITE PLAN UNLESS APPROVED BY EITHER RELEVANT DEPARTMENT SUPERINTENDENT OR THE PLANNING COMMISSION.
3. THE INFORMATION SHOWN ON THIS PLAN IS BASED UPON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIPZONE 4100 AND NAD 83 DATUM.
4. BASE INFORMATION WAS TAKEN FROM A TOPOGRAPHIC SURVEY PREPARED BY LITTLEJOHN, DATED MARCH 23, 2015. KIMLEY-HORN AND ASSOCIATES SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF THE BASE INFORMATION SHOWN.
5. THE CONSULTANT HAS FOUND NO EVIDENCE OF THE MINERAL RIGHTS OF THIS PROPERTY BEING TRANSFERRED TO ANY PARTY OTHER THAN THE OWNER.
6. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO BUILDINGS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006

R.O.W. & ACCESS GENERAL NOTES

1. PRIOR TO BEGINNING ANY CONSTRUCTION, THE DEVELOPER AND/OR CONTRACTOR, SHALL OBTAIN ALL NECESSARY PERMITS AS REQUIRED BY LAW. SUCH PERMITS MAY INCLUDE, BUT ARE NOT LIMITED TO, THOSE REQUIRED BY STATE OF TENNESSEE, WILLIAMSON COUNTY AND OTHER CITY OF FRANKLIN AGENCIES.

2. ALL OFF-SITE WORK WITHIN THE PUBLIC RIGHT-OF-WAY SHALL REQUIRE AN APPROVED TRAFFIC CONTROL PLAN WHICH COMPLIES WITH THE MUTCD. NO OFF-SITE EXCAVATION MAY BE UNDERTAKEN IN ANY STREET, ROAD, ALLEY OR RIGHT-OF-WAY OF ANY UTILITY OR TEMPORARY CONSTRUCTION EASEMENT OF THE CITY OF FRANKLIN BY ANY ENTITY UNLESS 72-HOUR NOTICE HAS BEEN GIVEN TO THE CITY OF FRANKLIN TRAFFIC OPERATIONS CENTER. THE CONTRACTOR SHALL HAVE AN APPROVED TRAFFIC CONTROL PLAN ONSITE DURING CONSTRUCTION.

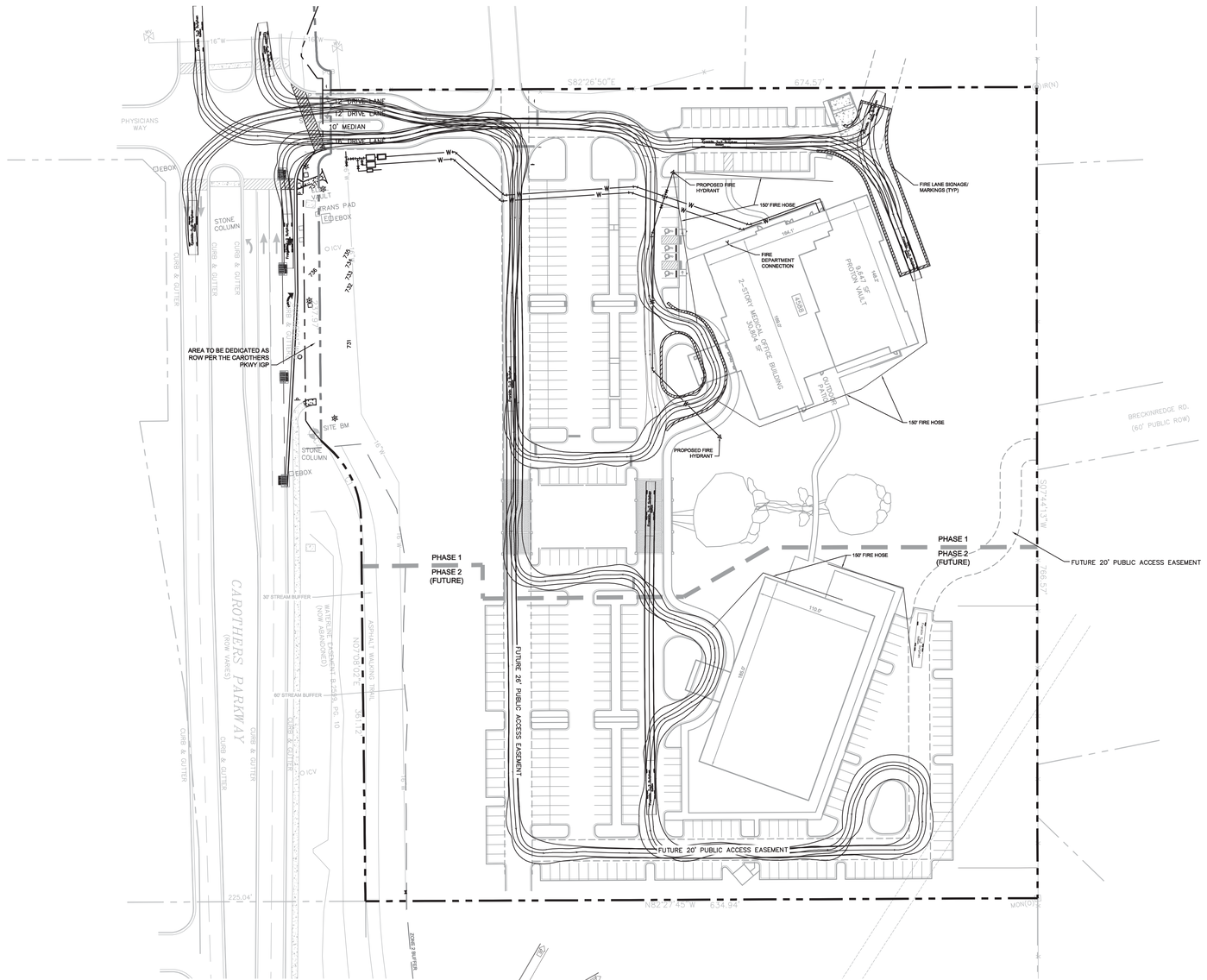
3. CONSTRUCTION MATERIALS SHALL BE FULLY TESTED IN ACCORDANCE WITH THE DESIGNATIONS AND REQUIREMENTS WITHIN THE REFERENCED "TDOT STANDARD SPECIFICATIONS" SECTIONS, UNLESS OTHERWISE NOTED WITHIN THE "STANDARD SPECIFICATIONS" SECTION OF THE CITY OF FRANKLIN TRANSPORTATION & STREET TECHNICAL STANDARDS.

4. AN AUTHORIZED REPRESENTATIVE OF THE CITY SHALL MAKE A FINAL INSPECTION OF THE PROJECT AFTER COMPLETION TO DETERMINE ACCEPTABILITY OF THE WORK AND FOR RELEASE OF PERFORMANCE BONDS IF REQUIRED. BEFORE THIS FINAL INSPECTION CAN BE MADE, THE ENGINEER RESPONSIBLE FOR THE PROJECT SHALL CERTIFY IN WRITING TO THE CITY ENGINEER THAT THE WORK HAS BEEN COMPLETED IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS.

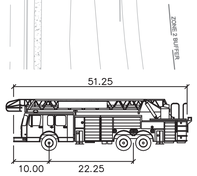
5. LOCATING AND COORDINATION FOR THE RELOCATION OF EXISTING UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR. TENNESSEE'S ONE-CALL AND THE CITY OF FRANKLIN UTILITY LOCATION SERVICE SHALL BE UTILIZED IN ADDITION TO COORDINATION WITH LOCAL UTILITY OWNERS. THE CONTRACTOR SHALL AT ALL TIMES PROTECT EXISTING UTILITIES AND WILL BE RESPONSIBLE FOR COSTS DUE TO DAMAGE CAUSED TO ANY UTILITY LINES.

6. ALL TEMPORARY STRIPING SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," PUBLISHED BY TDOT, THE LATEST REVISION EXCEPT AS HEREIN AMENDED. WHEN APPROVED, TEMPORARY STRIPING SHALL BE REQUIRED PRIOR TO THE OPENING OF A STREET FOR TRAVEL WHERE PAVEMENT AND/OR PERMANENT STRIPING CANNOT BE COMPLETED DUE TO WEATHER AND/OR TIME CONSTRAINTS.

7. THERMOPLASTIC PAVEMENT MARKINGS SHOULD BE USED ON ALL PUBLIC AND PRIVATE CITY STREET PROJECTS. THERMOPLASTIC TRAFFIC STRIPING AND PAVEMENT MARKINGS SHALL CONFORM TO SECTION 716.03 "THERMOPLASTIC PAVEMENT MARKINGS", OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS (TDOT), AND TO THE CITY OF FRANKLIN TRANSPORTATION & STREET TECHNICAL STANDARDS.

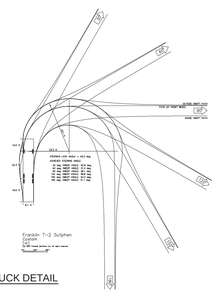


HYDRANT FLOW TEST REPORT:
DATE: AUGUST 25, 2015
TIME: 3:15 PM
COMPLETED BY: RFB, INC.
STATIC PRESSURE: 98 PSI
RESIDUAL PRESSURE: 94 PSI
FLOW: 1473 GPM

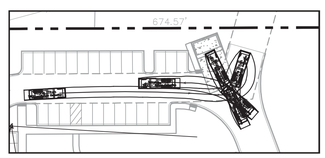


Franklin T-2 Sutphen

	feet
Width	: 8.66
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 42.0



CITY OF FRANKLIN FIRE TRUCK DETAIL
NOT TO SCALE



CITY OF FRANKLIN GARBAGE TRUCK DETAIL

GRAPHIC SCALE IN FEET
0 25 50 100

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Nashville, TN 37204
Main: 615.564.2701
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER — LICENSED PROFESSIONAL ENGINEER — NO. 109025 — STATE OF TENNESSEE — 4/1/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	CJM
DRAWN BY:	CJM
CHECKED BY:	RLM
DATE:	03/14/2016

KHA PROJECT NO.
118133000

ENLARGED ROW AND ACCESS PLAN

SHEET NUMBER
C4.1

COF# 6076

SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT:	KIMLEY-HORN & ASSOCIATES
Address:	214 OCEANSIDE DRIVE NASHVILLE, TN 37204
Phone:	615-564-2701
Email:	RYAN.MCMASTER@KIMLEY-HORN.COM
Contact Name:	RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
BUILDING SQUARE FOOTAGE:	101,501 SF
PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
MINIMUM LANDSCAPE SURFACE RATIO:	0.30 (2.07 AC PHASE 1)
PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
PARKING PROVIDED:	149 TOTAL SPACES 145 STANDARD SPACES 4 ADA SPACES 0 COMPACT SPACES
EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:

1. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
2. THIS SITE PLAN HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN STANDARDS AND THE APPROVAL OF PLANNING COMMISSION. CHANGES SHALL NOT BE MADE TO THE APPROVED SITE PLAN UNLESS APPROVED BY EITHER RELEVANT DEPARTMENT SUPERINTENDENT OR THE PLANNING COMMISSION.
3. THE INFORMATION SHOWN ON THIS PLAN IS BASED UPON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIPZONE 4100 AND NAD 83 DATUM.
4. BASE INFORMATION WAS TAKEN FROM A TOPOGRAPHIC SURVEY PREPARED BY LITTLEJOHN, DATED MARCH 23, 2015. KIMLEY-HORN AND ASSOCIATES SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF THE BASE INFORMATION SHOWN.
5. THE CONSULTANT HAS FOUND NO EVIDENCE OF THE MINERAL RIGHTS OF THIS PROPERTY BEING TRANSFERRED TO ANY PARTY OTHER THAN THE OWNER.
6. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO BUILDINGS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006

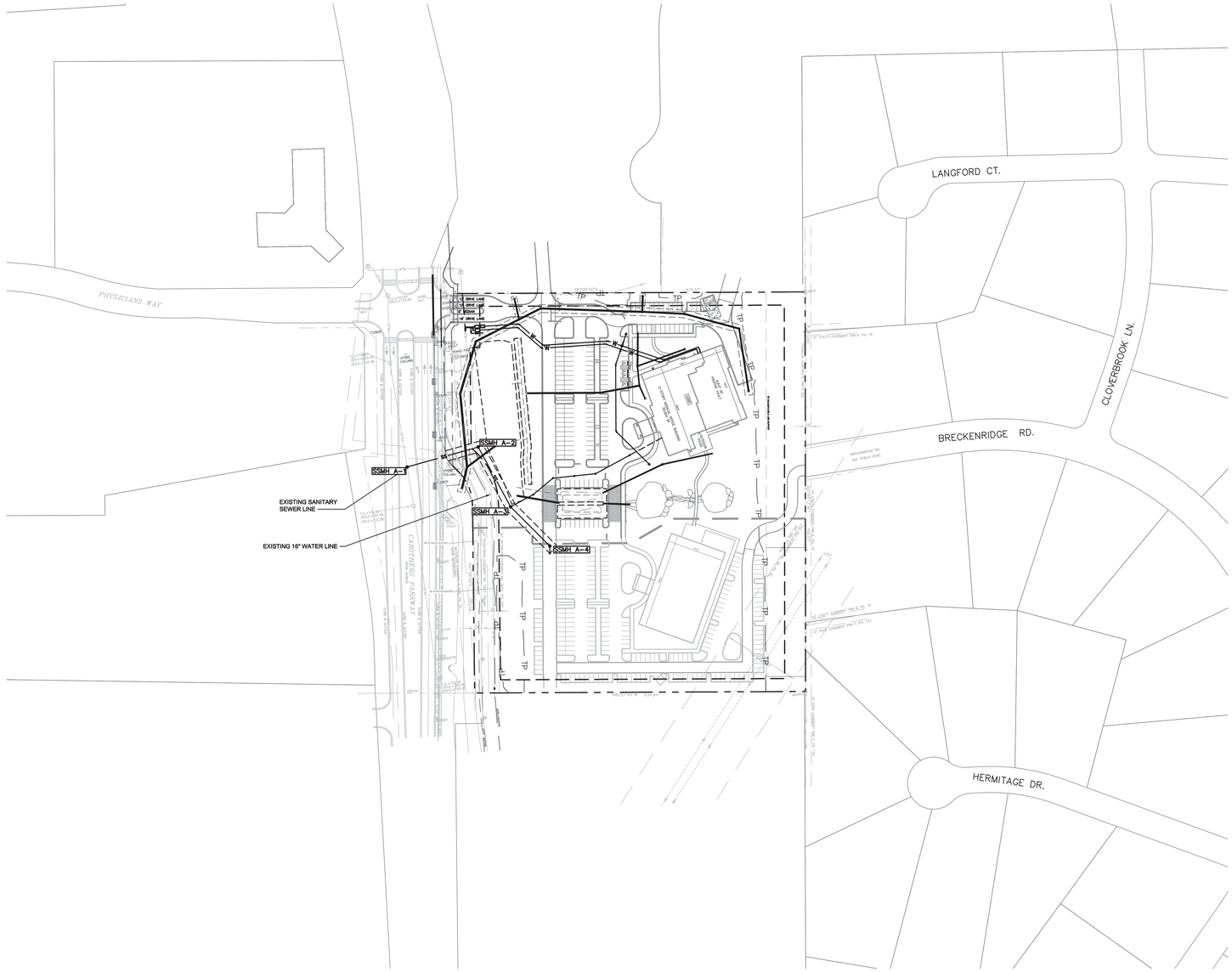
CITY OF FRANKLIN WMS

CITY OF FRANKLIN
124 LUMBER DRIVE
FRANKLIN, TN 37064
PHONE: (615)794-4554
CONTACT: BEN MCNEIL

THE CITY OF FRANKLIN WATER MANAGEMENT DEPARTMENT IS NOT A MEMBER OF TN ONE CALL. THE CONTRACTOR SHALL ALSO NOTIFY THE CITY OF FRANKLIN WATER MANAGEMENT DEPARTMENT TO LOCATE WATER AND/OR SEWER AT LEAST 72 HOURS PRIOR TO THE ESTIMATED TIME OF EXCAVATION.

LEGEND

W	6" WATER MAIN
G G	GAS LINE
	STORM SEWER
SS	SANITARY SEWER
	SANITARY SEWER SERVICE



NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

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Nashville, TN 37204
Main: 615.564.2701
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER — LICENSED PROFESSIONAL ENGINEER — 108182 — STATE OF TENNESSEE — 4/5/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	RJA
DRAWN BY:	RJA
CHECKED BY:	RLM
DATE:	03/14/2016

KHA PROJECT NO. 118133000

OVERALL UTILITY PLAN

SHEET NUMBER
C5.0

COF# 6076

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT:	KIMLEY-HORN & ASSOCIATES
Address:	214 OCEANSIDE DRIVE NASHVILLE, TN 37204
Phone:	615-564-2701
Email:	RYAN.MCMASTER@KIMLEY-HORN.COM
Contact Name:	RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
BUILDING SQUARE FOOTAGE:	101,501 SF
PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
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PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
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EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:

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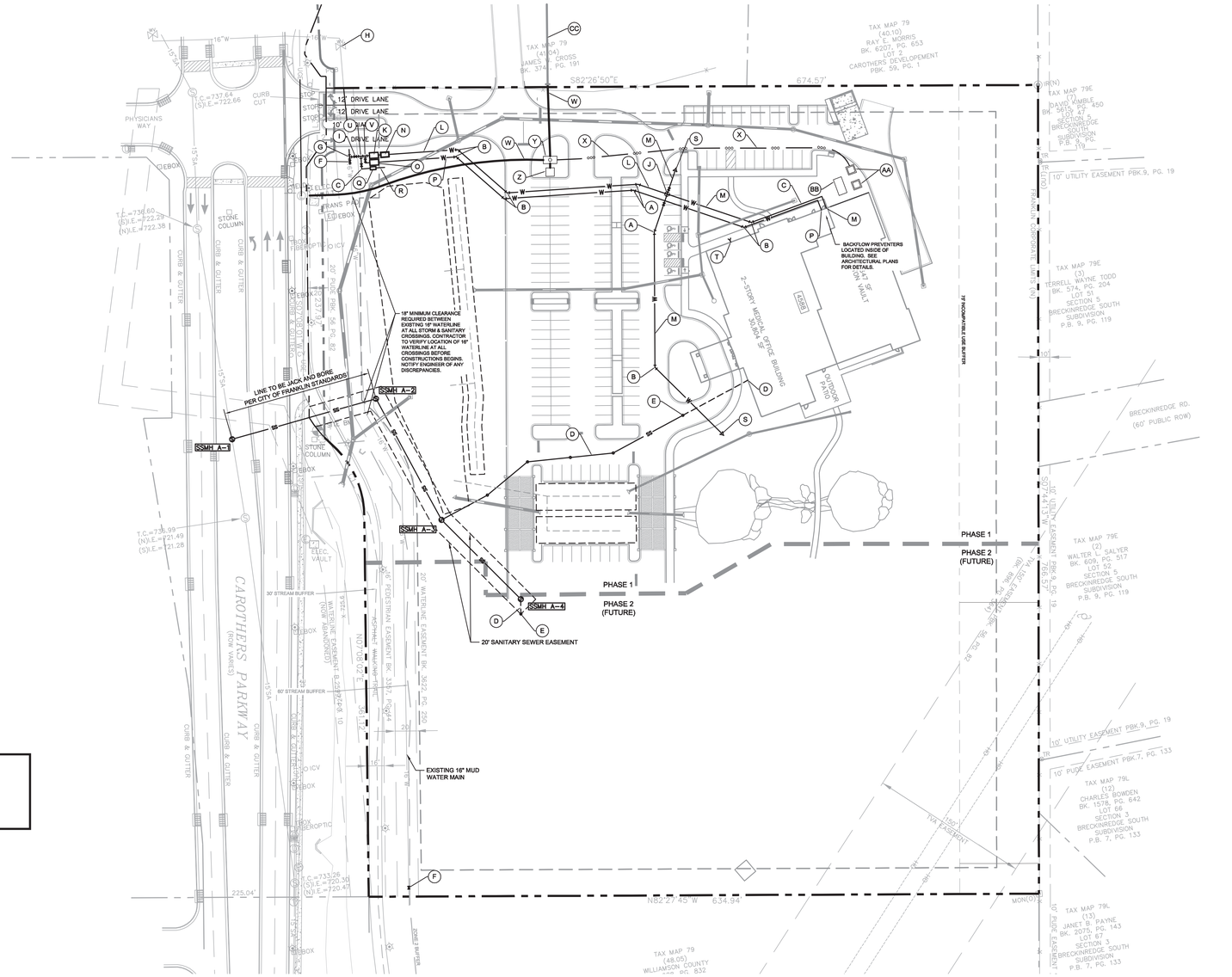
SITE PLAN KEY NOTES:

- (A) 22.5° BEND (TYP.)
- (B) 45° BEND (TYP.)
- (C) 90° BEND (TYP.)
- (D) INSTALL 8" SANITARY SEWER SERVICE @ 2% MIN. (TYP.)
- (E) SANITARY SEWER CLEANOUT (TYP.)
- (F) 16" MEGA LUG GATE VALVE
- (G) 16" X 8" MEGA LUG TEE (CUT-IN)
- (H) EXISTING 16" GATE VALVE
- (I) 8" MEGA LUG GATE VALVE
- (J) 8" X 6" X 6" X 6" CROSS
- (K) 6" FIRE METER
- (L) 8" FIRE LINE
- (M) 6" FIRE LINE
- (N) 6" DOUBLE DETECTOR CHECK VALVE
- (O) 2" DOMESTIC METER
- (P) 3" DOMESTIC SERVICE
- (Q) 2" IRRIGATION METER
- (R) 2" IRRIGATION SERVICE (TO BE EXTENDED BY CONTRACTOR)
- (S) FIRE HYDRANT ASSEMBLY
- (T) FIRE DEPARTMENT CONNECTION
- (U) 8" X 2" TEE
- (V) 8" X 3" TEE
- (W) 4 – 6" CONDUITS IN RED CONCRETE
- (X) 4 – 4" CONDUITS
- (Y) ELECTRICAL MANHOLE
- (Z) SWITCH

SITE PLAN KEY NOTES:

- (AA) TRANSFORMER
- (BB) GENERATOR
- (CC) EX. 4–6" CONDUITS IN RED CONCRETE BY OTHERS



WATER LINE DESIGN SHOWN ON THIS PLAN IS PRELIMINARY ONLY. CONTRACTOR SHALL CONTACT MILCROFTON UTILITY DISTRICT FOR FINAL WATER LINE DESIGN, WATER LINE SPECIFICATIONS AND CONNECTION TO EXISTING 16" WATER LINE.

MILCROFTON UTILITY DISTRICT
6333 ARNO RD.
FRANKLIN, TN 37064
PHONE: (605) 794-5947
CONTACT: MIKE JONES

CITY OF FRANKLIN WMS

CITY OF FRANKLIN
124 LUMBER DRIVE
FRANKLIN, TN 37064
PHONE: (615)794-4554
CONTACT: BEN MCNEIL

NOTE:
BACK FLOW PREVENTERS SHALL BE LOCATED INTERNAL TO THE PROPOSED BUILDING. COORDINATE WITH ARCHITECTURAL MEP PLANS FOR DETAILS.

THE CITY OF FRANKLIN WATER MANAGEMENT DEPARTMENT IS NOT A MEMBER OF TN ONE CALL. THE CONTRACTOR SHALL ALSO NOTIFY THE CITY OF FRANKLIN WATER MANAGEMENT DEPARTMENT TO LOCATE WATER AND/OR SEWER AT LEAST 72 HOURS PRIOR TO THE ESTIMATED TIME OF EXCAVATION.

LEGEND

- W — WATER LINE
- G — G — GAS LINE
- STORM SEWER
- SS — SS — SANITARY SEWER
- SANITARY SEWER SERVICE
- 4 - 6" CONDUITS IN RED CONCRETE
- 4 - 4" CONDUITS

HYDRANT FLOW TEST REPORT:
DATE: AUGUST 25, 2015
TIME: 3:15 PM
COMPLETED BY: RFB, INC.
STATIC PRESSURE: 98 PSI
RESIDUAL PRESSURE: 94 PSI
FLOW: 1473 GPM

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

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214 Oceanside Drive
Nashville, TN 37204
Main: 615.564.2701
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER — REGISTERED LANDSCAPE ARCHITECT — No. 108982 — STATE OF TENNESSEE

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	CJM
DRAWN BY:	CJM
CHECKED BY:	RLM
DATE:	03/14/2016
KHA PROJECT NO.	118133000

SITE UTILITY PLAN

SHEET NUMBER
C5.1
COF# 6076

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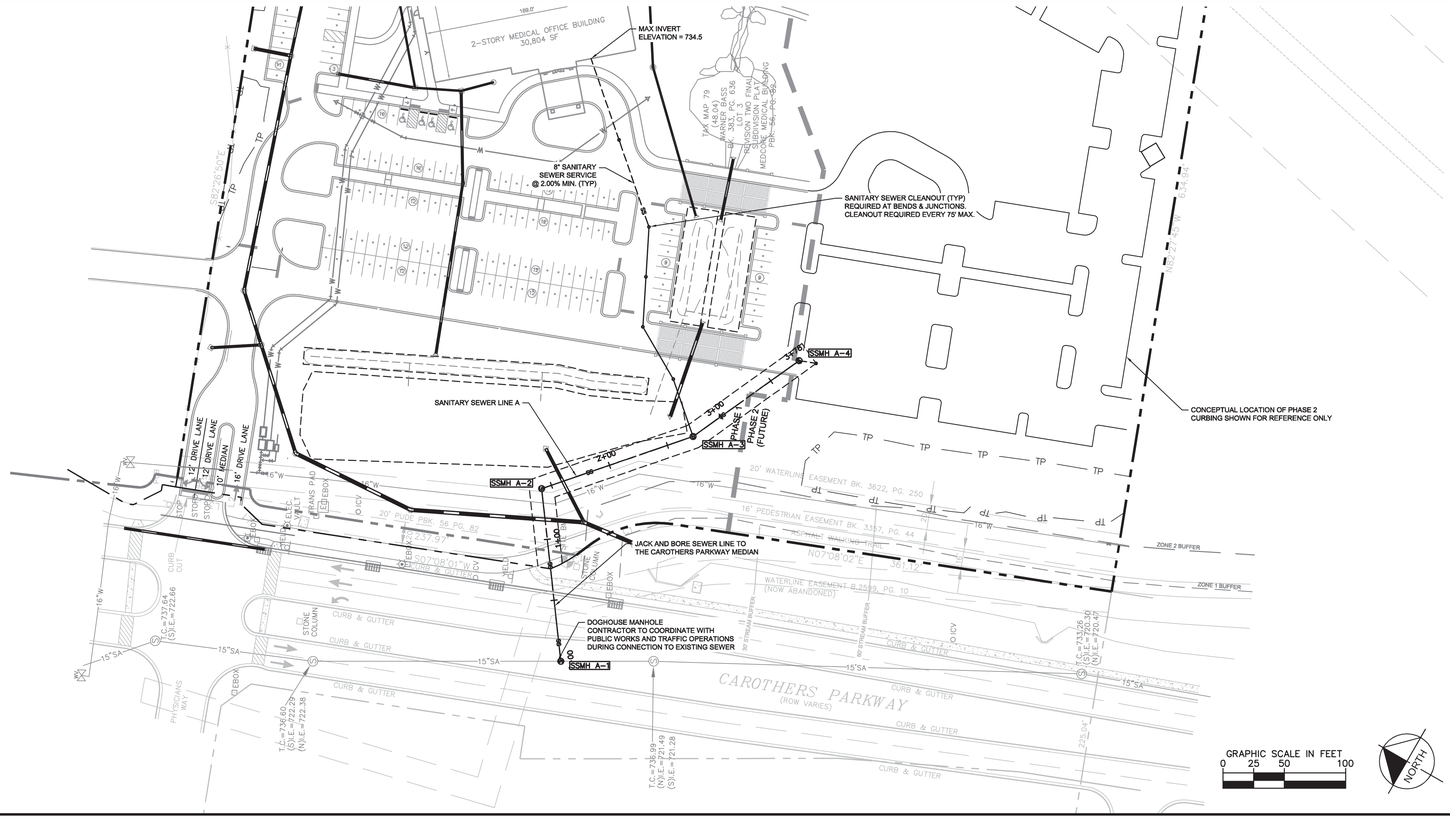
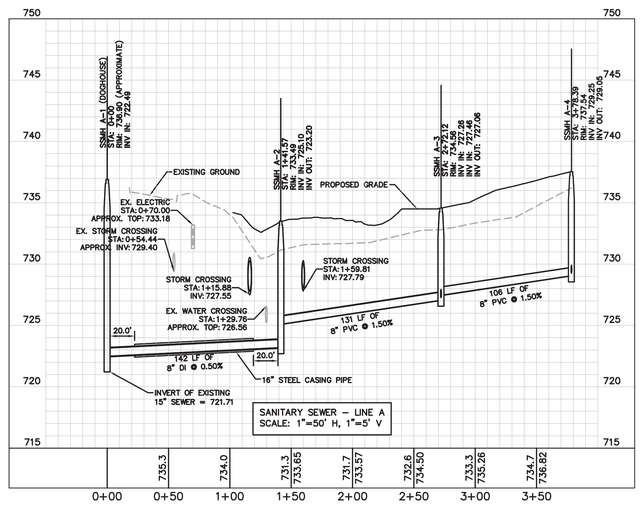
Drawing name: K:\NSH_LDEV\118133000 - Carothers MOB\4-CADD\3-PlanSheets\C5.1 Site Utility Plan - 118133000.dwg C5.1 Site Utility Plan Apr 07, 2016 10:29am by: yates.bateman

WATER LINE DESIGN SHOWN ON THIS PLAN IS PRELIMINARY ONLY. CONTRACTOR SHALL CONTACT MILCROFTON UTILITY DISTRICT FOR FINAL WATER LINE DESIGN, WATER LINE SPECIFICATIONS AND CONNECTION TO EXISTING 16" WATER LINE.

MILCROFTON UTILITY DISTRICT
6333 ARNO RD.
FRANKLIN, TN 37064
PHONE: (605) 794-5947
CONTACT: MIKE JONES





NOTE:
THE VERTICAL LOCATION OF EXISTING UTILITIES SHOWN ON THIS PLAN ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION. CONTRACTOR TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITY CROSSINGS PRIOR TO ORDERING STRUCTURES. IF CONFLICTS EXIST, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.

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Nashville, TN 37204
Main: 615.564.2701
www.kimley-horn.com
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DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER — LICENSED PROFESSIONAL ENGINEER — No. 109008 — STATE OF TENNESSEE — 4/1/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	CJM
DRAWN BY:	CJM
CHECKED BY:	RLM
DATE:	03/14/2016

KHA PROJECT NO. 118133000

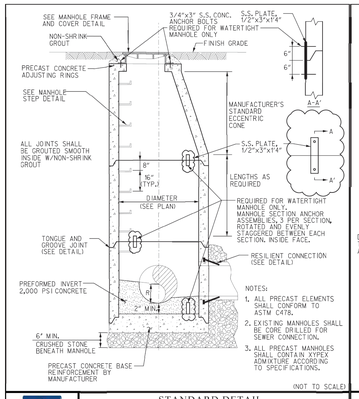
SITE UTILITY PLAN AND PROFILE - SANITARY SEWER

SHEET NUMBER
C5.2

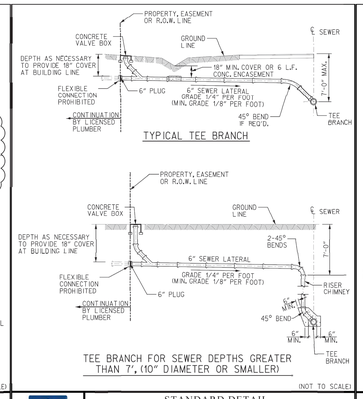
COF# 6076

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

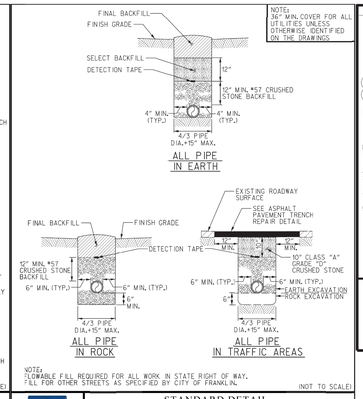
Drawing name: K:\NSH_LDEV\118133000 - Carothers MOB\4-CADD\3-PlanSheets\C5.2 SSWR Plan and Profile - 118133000.dwg C5.2 Site Utility Plan And Profile - Sanitary Sewer Apr 07, 2016 10:30am by: yates.bateman



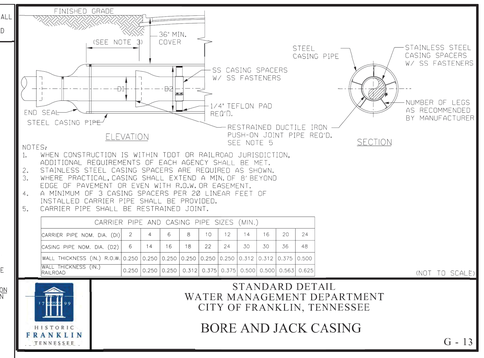
STANDARD DETAIL
WATER MANAGEMENT DEPARTMENT
CITY OF FRANKLIN, TENNESSEE
PRECAST CONCRETE MANHOLE
WW - 1



STANDARD DETAIL
WATER MANAGEMENT DEPARTMENT
CITY OF FRANKLIN, TENNESSEE
SANITARY SEWER LATERALS
WW - 3



STANDARD DETAIL
WATER MANAGEMENT DEPARTMENT
CITY OF FRANKLIN, TENNESSEE
BEDDING AND BACKFILLING FOR GRAVITY LINES
G - 10



CARRIER PIPE AND CASING PIPE SIZES (MIN.)										
CARRIER PIPE NOM. DIA. (DI)	2	4	6	8	10	12	14	16	20	24
CASING PIPE NOM. DIA. (D2)	6	14	16	18	22	24	30	30	36	48
WALL THICKNESS (tk) R.O.W.	0.250	0.250	0.250	0.250	0.250	0.250	0.312	0.312	0.375	0.500
WALL THICKNESS (tk) RAILROAD	0.250	0.250	0.250	0.312	0.375	0.375	0.500	0.500	0.563	0.625

(NOT TO SCALE)

STANDARD DETAIL
WATER MANAGEMENT DEPARTMENT
CITY OF FRANKLIN, TENNESSEE
BORE AND JACK CASING
G - 13

LENGTH OF PIPE TO BE RESTRAINED FOR PVC (FEET)

SIZE	A DEAD END	A TEE & PLUG	B 90° BEND	B 45° BEND	B 22 1/2° BEND	B 11 1/4° BEND
4"	32	31	15	6	3	2
6"	45	44	20	9	4	2
8"	59	57	26	11	6	3
10"	71	68	31	13	7	3
12"	83	80	36	15	8	4
14"	95	91	41	17	8	4
16"	107	102	46	19	9	5
20"	130	124	54	23	11	6
24"	151	144	63	26	13	7
>24"	SHALL BE CALCULATED INDEPENDENTLY WITH THE SPECIFIC CONDITIONS.					

TABLE APPLIES TO PVC PIPE FOR THE FOLLOWING CONDITIONS:
1. TEST PRESSURE: 150 PSI
2. SOIL TYPE: GW
3. LAYING CONDITION: TYPE 3
4. DEPTH OF COVER: 3'
5. SAFETY FACTOR: 1.5

(NOT TO SCALE)

STANDARD DETAIL
WATER MANAGEMENT DEPARTMENT
CITY OF FRANKLIN, TENNESSEE
RESTRAINED JOINT TABLE - PVC
G - 4

LENGTH OF PIPE TO BE RESTRAINED FOR DIP (FEET)

SIZE	A DEAD END	A TEE & PLUG	B 90° BEND	B 45° BEND	B 22 1/2° BEND	B 11 1/4° BEND
4"	27	27	15	7	3	2
6"	38	38	21	9	5	3
8"	49	49	27	12	6	3
10"	59	59	33	14	7	4
12"	69	69	38	16	8	4
14"	79	79	43	18	9	5
16"	89	89	48	20	10	5
20"	107	107	58	24	12	6
24"	125	125	67	28	14	7
>24"	SHALL BE CALCULATED INDEPENDENTLY WITH THE SPECIFIC CONDITIONS.					

TABLE APPLIES TO DUCTILE IRON PIPE FOR THE FOLLOWING CONDITIONS:
1. TEST PRESSURE: 200 PSI
2. SOIL TYPE: GW
3. LAYING CONDITION: TYPE 2
4. DEPTH OF COVER: 3'
5. SAFETY FACTOR: 1.5

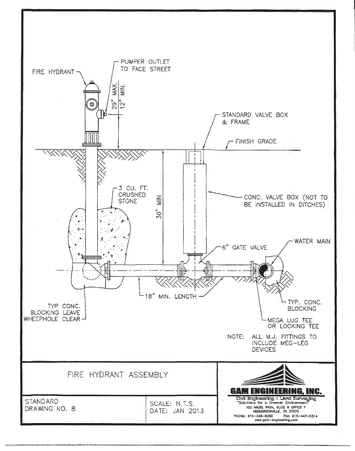
(NOT TO SCALE)

STANDARD DETAIL
WATER MANAGEMENT DEPARTMENT
CITY OF FRANKLIN, TENNESSEE
RESTRAINED JOINT TABLE - DIP
G - 5

Dia. (in)	L (in)	W (in)	MAX. FLOW (GPM)	ACCESS DOOR (FT)
4	72	48	500	4x4
6	84	48	1,200	4x4
8	96	60	1,500	4x6

(NOT TO SCALE)

STANDARD DETAIL
WATER MANAGEMENT DEPARTMENT
CITY OF FRANKLIN, TENNESSEE
DOUBLE CHECK VALVE ASSEMBLY FOR 4" TO 8" LINES (BELOW GROUND)
W - 6



FIRE HYDRANT ASSEMBLY

STANDARD DRAWING NO. 8 | SCALE: N.T.S. | DATE: JAN 2013

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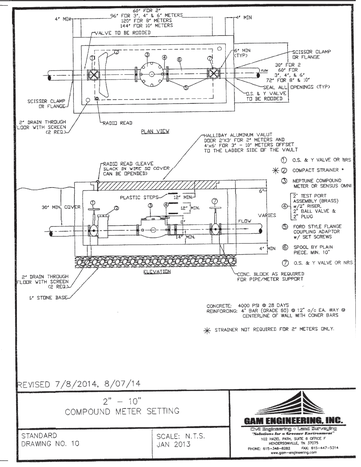

REVISED 7/8/2014, 8/07/14

2" - 10" COMPOUND METER SETTING

STANDARD DRAWING NO. 10 | SCALE: N.T.S. | JAN 2013

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www.kimley-horn.com
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

RYAN McMASTER
STATE OF TENNESSEE
REGISTERED
LICENSED
LANDSCAPE
ARCHITECT
No. 109028
4/6/16

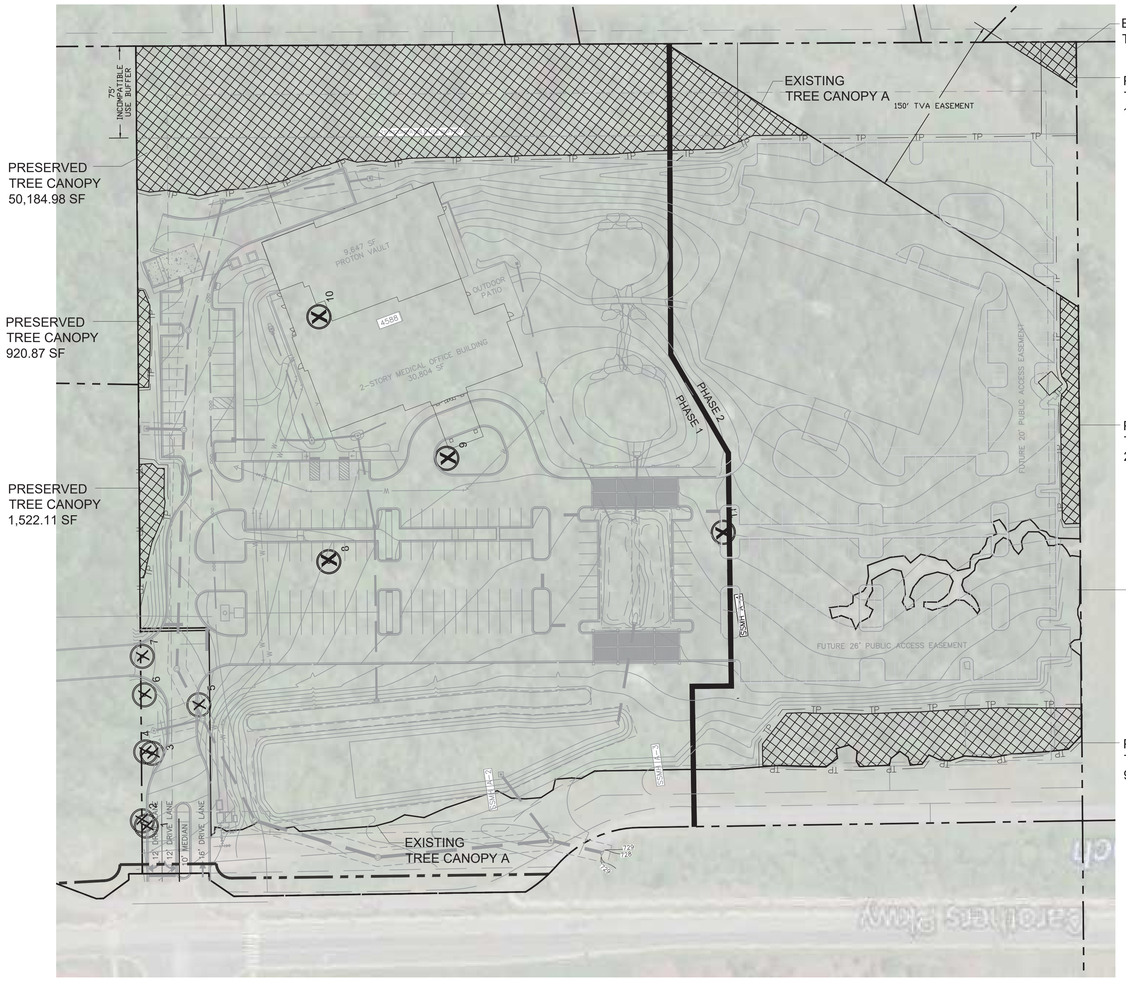
No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY: CJM
DRAWN BY: CJM
CHECKED BY: RLM
DATE: 03/14/2016
KHA PROJECT NO. 118133000

UTILITY DETAILS

SHEET NUMBER
C5.3
COF# 6076

Drawing name: K:\NSH_LDEV\118133000 - Carothers MOBI4-CADD\3-PlanSheets\C2.2-C5.3 Details - 118133000.dwg C5.3 Utility Details Apr 07, 2016 10:33am by: yates.bateman



GRAPHIC SCALE 1"=50'
50 0 50 100 150

SITE DATA:

PROJECT NAME:	SHPT CENTER, SITE PLAN, REVISION 1
PROJECT NUMBER:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
SITE ACREAGE:	11.62 AC.
ZONING:	GO - GENERAL OFFICE DISTRICT
APPLICABLE OVERLAYS:	MECO-5
DEVELOPMENT STANDARDS:	CONVENTIONAL
MINIMUM REQUIRED LSA:	30%, 2.07 AC.
PROVIDED LSA:	45%, 3.1 AC
ORIGINAL CANOPY COVER:	9.58 AC, 82% OF TOTAL SITE
PRESERVED CANOPY COVER:	1.52 AC, 16% OF ORIGINAL CANOPY
SPECIMEN TREE REMOVAL:	4 TREES, 112 INCHES DBH

SPECIMEN TREES

NUMBER	TYPE	SIZE-DBH	HEALTH	STATUS
1	HACKBERRY	24"	FAIR	ACCOUNTED FOR WITH ACCESS EASEMENT, NOT PART OF THIS SITE PLAN.
2	OAK	30"	FAIR	ACCOUNTED FOR WITH ACCESS EASEMENT, NOT PART OF THIS SITE PLAN.
3	HACKBERRY	30"	FAIR	ACCOUNTED FOR WITH ACCESS EASEMENT, NOT PART OF THIS SITE PLAN.
4	HACKBERRY	30"	FAIR	ACCOUNTED FOR WITH ACCESS EASEMENT, NOT PART OF THIS SITE PLAN.
5	HACKBERRY	24"	FAIR	ACCOUNTED FOR WITH ACCESS EASEMENT, NOT PART OF THIS SITE PLAN
6	HACKBERRY	24"	FAIR	ACCOUNTED FOR WITH ACCESS EASEMENT, NOT PART OF THIS SITE PLAN
7	HACKBERRY	30"	FAIR	ACCOUNTED FOR WITH ACCESS EASEMENT, NOT PART OF THIS SITE PLAN
8	OAK	36"	FAIR	REMOVED
9	OAK	24"	FAIR	REMOVED
10	OAK	28"	FAIR	REMOVED
11	BOXELDER	24"	FAIR	REMOVED

TOTAL SPECIMEN INCHES REMOVED: 112
TOTAL HEALTHY INCHES REMOVED: 112
REPLACEMENT REQUIRED: 224 INCHES

TREE CANOPY RETENTION

TREE CANOPY	EXISTING	REMOVED	RETAINED
A	416,212.23 SF	351,165.23 SF	65,047.0 SF
B	1,070.22	0 SF	1,070.22 SF
TOTAL SF	416,212.23 SF	351,165.23 SF	66,117.22 SF
TOTAL ACRES	9.58 AC	8.11 AC	1.52AC

TREE CANOPY DATA

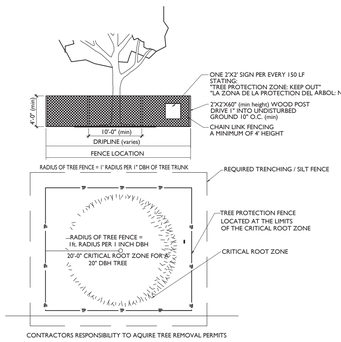
EXISTING TREE CANOPY: 417,282.44SF (82% OF TOTAL SITE)
REQUIRED CANOPY PRESERVATION = 15%
REQUIRED PRESERVATION = 62,592.36 SF (1.44 AC)

PROVIDED TREE CANOPY PRESERVATION: 66,117.22 SF (16%)

KEY:

SPECIMEN TREE

TREE PRESERVATION AREA



TREE PROTECTION FENCING DETAIL

TREE PROTECTION NOTES:

1. The tree protection barriers shall be constructed before the issuance of any permits, and shall remain intact throughout the entire period of construction.

2. The tree protection barrier shall be installed as labeled on this plan or a distance to the radius of the dripline, whichever is greatest, as measured from the trunk of the protected tree.

3. Any required excavation in or around the protection zone to accommodate underground services, footings, etc; shall be indicated on the plan, and shall be excavated by hand. In addition, relased root pruning shall be accomplished via ANSI A-300-95 standard so as to minimize impact on the general root system.

4. The storage of building materials or stock piling shall not be permitted within the limits of or against the protection barriers.

5. Trees within the protection barriers must be adequately cared for throughout the construction process (i.e., they must be watered sufficiently). Fill shall not be placed upon the root system as to endanger the health or life of the affected tree.

Landscape Architecture Provided by:
Gamble Design Collaborative, LLC
Greg Gamble, RLA
144 Southeast Parkway, Suite 200
Franklin, Tennessee 37064
615.975.5765
greggamble209@gmail.com

TREE PRESERVATION / REMOVAL PLAN

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DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

SCOTT HAMILTON
PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

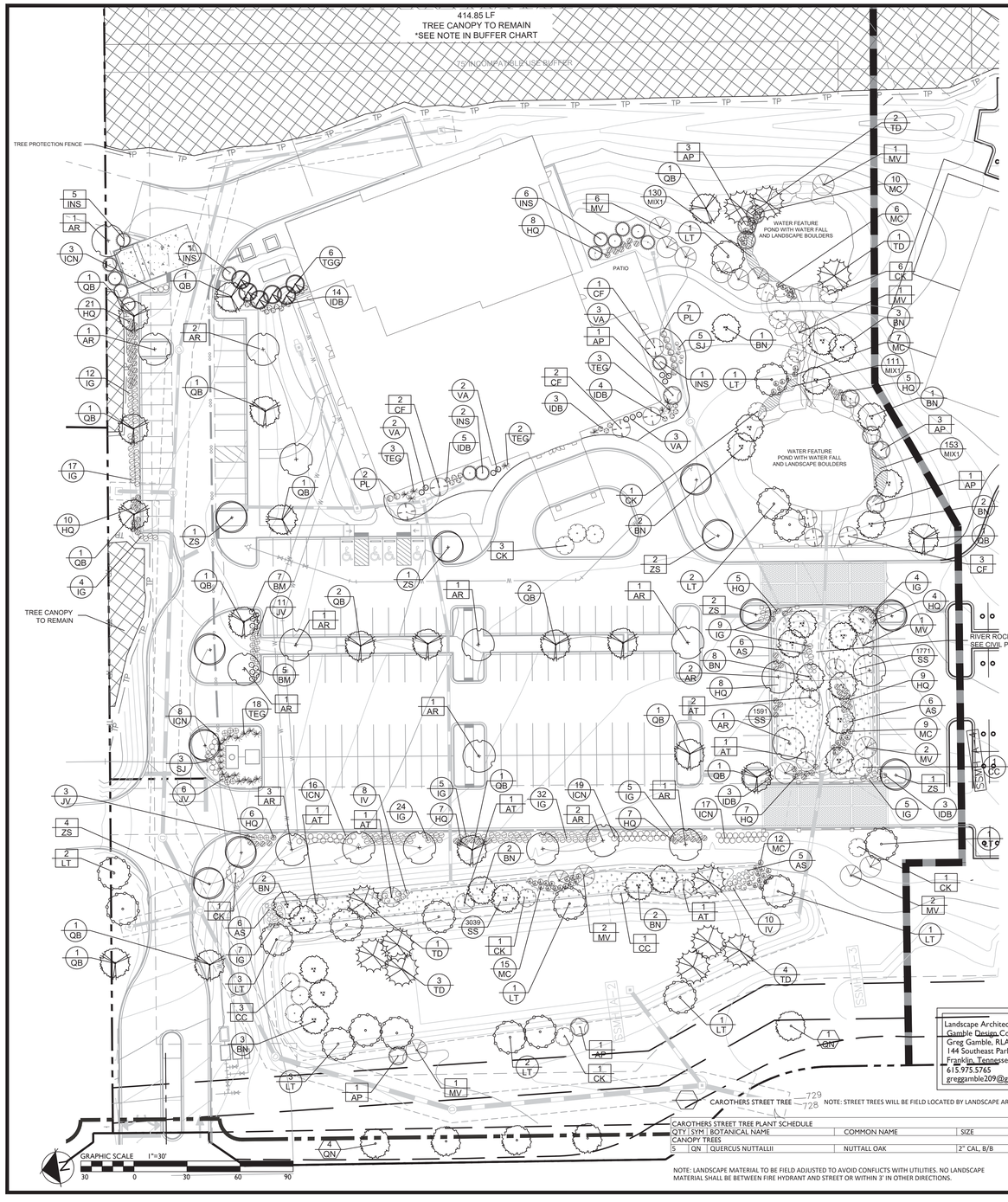
GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT

No.	REVISIONS	DATE	BY
1	CITY OF FRANKLIN COMMENTS	4.7.2016	

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE: 3/14/2016
KHA PROJECT NO. 118133000

TREE PRESERVATION

SHEET NUMBER
L1-00
COF# 6076



SPECIMEN TREE REPLACEMENT		
TOTAL SPECIMEN IN. REMOVED: 120 TOTAL HEALTHY IN. REMOVED: 120 REPLACEMENT IN. REQUIRED (TOTAL SITE): 224	QUANTITY PROVIDED (PHASE 1)	CALIPER INCH CONVERSION
3" CALIPER CANOPY TREES	16	48
2" CALIPER CANOPY TREES	-	-
2" CALIPER UNDERSTORY TREES	59	118
TOTAL CALIPER IN. OF REPLACEMENT TREE PROVIDED (PHASE 1):		166
DBH IN. OF SPECIMEN TREE REPLACEMENT REQUIRED (TOTAL SITE):		224
REPLACEMENT CALIPER INCH SURPLUS/STORAGE:		(-58)

SPECIMEN TREE REPLACEMENT CHART			
	REPLACEMENT IN. REQUIRED	INCHES REPLACED	TOTAL REMAINING
PHASE 1	224	166	58 IN
TOTAL REPLACEMENT			58 IN

LANDSCAPE REQUIREMENTS OF PHASE I: (ACI)				
PHASE I = 6.91 AC REQUIRED LSR = 0.30 (2.07 AC) TOTAL LSA WITHOUT TREE CANOPY = 3.10 AC (45%)	CANOPY (82" PER AC)= 255" UNDERSTORY (21" PER AC) = 66" SHRUBS (96 PER AC) = 298	QUANTITY PROVIDED		INCHES PROVIDED
		EXISTING TREES	PROPOSED PHASE 1	CALIPER INCHES
EXISTING TREES			-	-
EXISTING TREES (SEE TREE INVENTORY)			-	-
4" CALIPER CANOPY TREES:			-	-
3" CALIPER CANOPY TREES:			59	177
2" CALIPER CANOPY TREES:			26	52
AGGEGATE CANOPY CALIPER INCHES PROVIDED:				229
AGGREGATE CANOPY CALIPER INCHES REQUIRED:				255
2" CALIPER UNDERSTORY TREES			16	32
1.5" CALIPER UNDERSTORY TREES			-	-
AGGEGATE UNDERSTORY CALIPER INCHES PROVIDED:				30
AGGREGATE UNDERSTORY CALIPER INCHES REQUIRED:				66
MINIMUM 18" HEIGHT SHRUBS			141	141
MINIMUM 30" HEIGHT SHRUBS			332	332
TOTAL SHRUBS PROVIDED				473
TOTAL SHRUBS REQUIRED				298

SITE DATA:

PROJECT NAME:	SHPT CENTER, SITE PLAN, REVISION 1
PROJECT NUMBER:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
SITE ACREAGE:	11.62 AC
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PRESERVED CANOPY COVER:	1.52 AC, 16% OF ORIGINAL CANOPY
SPECIMEN TREE REMOVAL:	4 TREES, 112 INCHES DBH

INCOMPATIBLE USE BUFFER
DEVELOPING USE: GENERAL OFFICE
EXISTING ADJACENT USE/ZONING: DETACHED RESIDENTIAL
SITE ACREAGE: 11.6 AC
BUFFER CLASS: B
BUFFER WIDTH: 75'
BUFFER LENGTH: 766.57'
MINIMUM TREES REQUIRED: (15 TREES PER 100 LF)
TREES PROVIDED: 0
MINIMUM SHRUBS REQUIRED: (60 SHRUBS PER 100 LF)
SHRUBS PROVIDED: 0
*NOTE: APPLICANT REQUESTS EXISTING TREE CANOPY TO BE PRESERVED TO COUNT TOWARDS BUFFER REQUIREMENTS FOR 415 LF

OPEN SPACE REQUIREMENT CHART
MINIMUM OPEN SPACE REQUIREMENT: 5% 5% * 6.91 SITE AC = 0.35 AC, 15,058 SF NOTE: ALL OPEN SPACE IS FORMAL

OPEN SPACE PROVIDED:

KEY	CLASSIFICATION	TYPE	AREA (SF)	PAVED AREA	% PAVED IMPERVIOUS
AREA 1	FORMAL	PLAZA	15,088	1,948 SF	12.9%

XX / XX REQUIRED PLANT MATERIAL — XX / XX SPECIMEN REPLACEMENT

PLANT SCHEDULE

QTY	SYM	BOTANICAL NAME	COMMON NAME	SIZE	HEIGHT	LEAF	SPACING	NOTES
CANOPY TREES								
15	AR	ACER RUBRUM 'AUTUMN FLAME'	AUTUMN FLAME RED MAPLE	3" CAL, B/B	12'-14'	DECIDUOUS	AS SHOWN	CENTRAL LEADER
9	BN	BETULA NIGRA 'DURA HEAT'	DURA HEAT RIVER BIRCH	2" CAL, B/B	8'-10'	DECIDUOUS	AS SHOWN	MULTI-CANED
9	LT	LIRIODENDRON TULIPIFERA	TULIP POPLAR TREE	3" CAL, B/B	10'-12'	DECIDUOUS	AS SHOWN	CENTRAL LEADER
18	QB	QUERCUS BICOLOR	SWAMP WHITE OAK	3" CAL, B/B	10'-12'	DECIDUOUS	AS SHOWN	CENTRAL LEADER
3	TD	TAXODIUM DISTICHUM	BALD CYPRESS	3" CAL, B/B	10'-12'	DECIDUOUS	AS SHOWN	CENTRAL LEADER
6	TGG	THUJA	GREEN GIANT ARBORVITAE	2.5" CAL, B/B	8'-10'	EVERGREEN	AS SHOWN	FULL BRANCHING
11	ZS	ZELKOVA SERRATA 'GREEN VASE'	GREEN VASE JAPANESE ZELKOVA	3" CAL, B/B	10'-12'	DECIDUOUS	AS SHOWN	CENTRAL LEADER
UNDERSTORY TREES								
10	AP	ACER PALMATUM 'BLOODGOOD'	BLOODGOOD JAPANESE MAPLE	2" CAL, B/B	6'-8'	DECIDUOUS	AS SHOWN	BALANCED CANOPY
8	CF	CORNUS FLORIDA	FLOWERING DOGWOOD	2" CAL, B/B	6'-8'	DECIDUOUS	AS SHOWN	BALANCED CANOPY
13	CK	CORNUS KOUSA	KOUSA DOGWOOD	2" CAL, B/B	6'-8'	DECIDUOUS	AS SHOWN	BALANCED CANOPY
15	INS	ILEX X 'NELLIE R. STEVENS'	NELLIE R. STEVENS HOLLY	2" CAL, B/B	6'-8'	EVERGREEN	AS SHOWN	FULL BRANCHING
11	MV	MAGNOLIA VIRGINIANA	SWEETBAY MAGNOLIA	2" CAL, B/B	6'-8'	EVERGREEN	AS SHOWN	BALANCED CANOPY
SHRUBS								
10	BM	BUXUS MICROPHYLLA 'WINTERGREEN'	WINTERGREEN BOXWOOD	7 GAL.	30" X 24"	EVERGREEN	36" O.C.	
64	HQ	HYDRANGEA QUERCIFOLIA	OAKLEAF HYDRANGEA	3 GAL.	24" x 24"	DECIDUOUS	42" O.C.	
63	ICN	ILEX CORNUTA 'NEEDLEPOINT'	NEEDLEPOINT HOLLY	3 GAL.	30" X 24"	EVERGREEN	42" O.C.	
26	IDB	ILEX CORNUTA 'DWARF BURFORD'	DWARF BURFORD HOLLY	3 GAL.	30" X 24"	EVERGREEN	36" O.C.	
101	IG	ILEX GLABRA	INKBERRY	3 GAL.	24" X 24"	EVERGREEN	42" O.C.	
20	JV	JUNIPERUS VIRGINIANA 'GREY OWL'	GREY OWL JUNIPER	3 GAL.	30" X 24"	EVERGREEN	36" O.C.	
23	MC	MUHLENBERGIA CAPILLARIS	PINK MUHLY GRASS	3 GAL.	30" X 24"	DECIDUOUS	36" O.C.	
9	PL	PRUNUS LAUROCERASUS 'OTTO LUYKEN'	OTTO LUYKEN LAUREL	3 GAL.	24" X 24"	EVERGREEN	42" O.C.	
8	SJ	SPIREA JAPONICA 'GOLDMOUND'	GOLDMOUND SPIREA	3 GAL.	24" X 24"	DECIDUOUS	36" O.C.	
26	TEG	THUJA OCCIDENTALIS 'SMARAGD'	EMERALD GREEN ARBORVITAE	7 GAL.	30" X 24"	EVERGREEN	48" O.C.	
10	VA	VIBURNUM X RHYTIDOPHYLLOIDES	ALLEGHANY VIBURNUM	3 GAL.	30" X 24"	EVERGREEN	36" O.C.	
PERENNIALS								
394	MIX1	RUDBECKIA HIRTA	BLACKEYED SUSAN	4" POT				40% MIX
SF		AMSONIA TABERNAEMONTANA	BLUESTAR	4" POT				20% MIX
		ECHINACEA PURPUREA	PURPLE CONEFLOWER	4" POT				40% MIX

NOTE: LANDSCAPE MATERIAL TO BE FIELD ADJUSTED TO AVOID CONFLICTS WITH UTILITIES. NO LANDSCAPE MATERIAL SHALL BE BETWEEN FIRE HYDRANT AND STREET OR WITHIN 3' IN OTHER DIRECTIONS.

XX / XX REQUIRED PLANT MATERIAL — XX / XX SPECIMEN REPLACEMENT

BIO RETENTION PLANT SCHEDULE

QTY	SYM	BOTANICAL NAME	COMMON NAME	SIZE	HEIGHT	LEAF	SPACING	NOTES
CANOPY TREES								
3	AR	ACER RUBRUM 'AUTUMN FLAME'	AUTUMN FLAME RED MAPLE	3" CAL, B/B	12'-14'	DECIDUOUS	AS SHOWN	CENTRAL LEADER
17	BN	BETULA NIGRA 'DURA HEAT'	DURA HEAT RIVER BIRCH	2" CAL, B/B	8'-10'	DECIDUOUS	AS SHOWN	MULTI-CANED
8	LT	LIRIODENDRON TULIPIFERA	TULIP POPLAR TREE	3" CAL, B/B	10'-12'	DECIDUOUS	AS SHOWN	CENTRAL LEADER
8	TD	TAXODIUM DISTICHUM	BALD CYPRESS	3" CAL, B/B	10'-12'	DECIDUOUS	AS SHOWN	CENTRAL LEADER
UNDERSTORY TREES								
7	AT	ASIMINA TRILOBA	PAWPAW	2" CAL, B/B	6'-8'	DECIDUOUS	AS SHOWN	BALANCED CANOPY
5	CC	CERCIS CANADENSIS 'FOREST PANSY'	FORESTY PANSY REDBUD	2" CAL, B/B	6'-8'	DECIDUOUS	AS SHOWN	BALANCED CANOPY
5	MV	MAGNOLIA VIRGINIANA	SWEETBAY MAGNOLIA	2" CAL, B/B	6'-8'	EVERGREEN	AS SHOWN	BALANCED CANOPY
SHRUBS								
33	HQ	HYDRANGEA QUERCIFOLIA	OAKLEAF HYDRANGEA	3 GAL.	24" x 24"	DECIDUOUS	42" O.C.	
5	IDB	ILEX CORNUTA 'DWARF BURFORD'	DWARF BURFORD HOLLY	3 GAL.	30" X 24"	EVERGREEN	36" O.C.	
25	IG	ILEX GLABRA	INKBERRY	3 GAL.	24" X 24"	EVERGREEN	42" O.C.	
18	IV	ILEX VERTICILLATA	WINTERBERRY	3 GAL.	18" X 24"	DECIDUOUS	36" O.C.	
36	MC	MUHLENBERGIA CAPILLARIS	PINK MUHLY GRASS	3 GAL.	30" X 24"	DECIDUOUS	36" O.C.	
PERENNIAL								
23	AS	ASCLEPIAS SYRICACA	COMMON MILKWEED	1 GAL.	12"			
GROUNDCOVER								
SEED	SS	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	6,401 SF	RATE 10 LBS/ACRE			

NOTE: LANDSCAPE MATERIAL TO BE FIELD ADJUSTED TO AVOID CONFLICTS WITH UTILITIES. NO LANDSCAPE MATERIAL SHALL BE BETWEEN FIRE HYDRANT AND STREET OR WITHIN 3' IN OTHER DIRECTIONS.

CAROTHERS STREET TREE — NOTE: STREET TREES WILL BE FIELD LOCATED BY LANDSCAPE ARCHITECT AND CITY OF FRANKLIN LAND PLANNER.

CAROTHERS STREET TREE PLANT SCHEDULE

QTY	SYM	BOTANICAL NAME	COMMON NAME	SIZE	HEIGHT	LEAF	SPACING	NOTES
CANOPY TREES								
5	QN	QUERCUS NUTTALLII	NUTTALL OAK	2" CAL, B/B	8'-10'	DECIDUOUS	AS SHOWN	CENTRAL LEADER

NOTE: LANDSCAPE MATERIAL TO BE FIELD ADJUSTED TO AVOID CONFLICTS WITH UTILITIES. NO LANDSCAPE MATERIAL SHALL BE BETWEEN FIRE HYDRANT AND STREET OR WITHIN 3' IN OTHER DIRECTIONS.

Landscape Architecture Provided by:
Gamble Design Collaborative, LLC
Greg Gamble, RLA
144 Southeast Parkway, Suite 200
Franklin, Tennessee 37064
615.975.5765
greggamble209@gmail.com

AFTER INSTALLATION LANDSCAPE WILL BE MAINTAINED BY:

PROVISION SOLUTIONS
JOHN PATTERSON
5847 SAN FELIPE RD. SUITE 2575
HOUSTON, TEXAS 77056
(281) 705-0102

ATTENTION OWNER/INSTALLER:
This landscape plan has been designed to meet the minimum requirements of the City of Franklin zoning ordinance, the approval of the planning commission, and planning department policy. Relocating, substituting, resizing, reducing, or deleting material may cause the site to no longer conform to the requirements; thus problems may arise with releasing the performance/maintenance surety for the landcape material. Deviation from the approved landscape plan shall not be made without first consulting the Landscape Architect who designed the project. The designing Landscape Architect shall review proposed substitutions to ensure that all City standards and requirements are met. The City shall be notified in writing upon final approval of any plant substitutions.

Applicant: Provision Solutions
itect: Greg Gamble 615.975.5765
g Department: 615.791.3212

MINIMUM BUFFER/SCREENING REQUIREMENTS:
HVAC units, cooling and/or mechanical equipment are mounted on the:
☒ Rooftop
☐ Ground

THIS DEVELOPMENT IS REQUIRED TO HAVE THE FOLLOWING LANDSCAPE IMPROVEMENTS:

Buffer/Screen Type:	Purpose:
☒ Foundation Planting	Along primary facade
☒ Perimeter Planting Strip	Screen VUAs and to create "modules"
☒ Interior VUA Planting	Create VUA "modules"
☒ Utility Box Screen from view	Screen Utility Boxes and Meters from view
☒ HVAC Screen	Screen HVAC from view
☒ Dumpster Screen	Screen dumpster from view
☒ Loading/service Area	Buffer the street or residential property
☒ Incompatible Use Buffer	Buffer the adjacent less intensive use

LANDSCAPE PLAN

Kimley»Horn
209 Tenth Avenue South, Suite 501
Nashville, TN 37203
PHONE: 615 564 2701
www.kimley-horn.com
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON
PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

GREGORY C. GAMBLE
TENNESSEE
REGISTERED
LANDSCAPE ARCHITECT

NO.	REVISIONS	DATE	BY
1	CITY OF FRANKLIN COMMENTS	4.7.2016	
2			

DESIGNED BY: RJA
DRAWN BY: RJA
CHECKED BY: RLM
DATE: 2/26/2016
KHA PROJECT NO. 118133000

LANDSCAPE PLAN

SHEET NUMBER
L2-00
COF# 6076

CITY OF FRANKLIN LANDSCAPE NOTES:

1. ANY PLANT MATERIAL THAT DIES, TURNS BROWN OR DEFOLIATES SHALL BE REPLACED WITHIN ONE YEAR OR BY THE NEXT GROWING SEASON, WHICH EVER COMES FIRST. OTHER DEFECTIVE LANDSCAPE MATERIAL SHALL BE REPLACED WITHIN THREE MONTHS.

2. ALL TREES SHALL MEET FRANKLIN'S MINIMUM SIZE AND QUALITY STANDARDS. ALL PLANTS SHALL BE HEALTHY, VIGOROUS MATERIAL, FREE OF PEST AND DISEASE. ALL ROOTBALLS, CONTAINERS, AND HEIGHT TO WIDTH RATIOS SHALL CONFORM TO THE SIZE STANDARDS SET FORTH IN THE AMERICAN STANDARDS FOR NURSERY STOCK, CURRENT EDITION.

3. ALL REQUIRED TREES AND SHRUBS SHALL MEET THE MINIMUM SIZE AND QUANTITY AS LISTED IN THE PLANT SCHEDULE.

4. PLANT MATERIAL SHALL NOT OBSCURE TRAFFIC OR PARKING SIGNS/SIGNALS OR VEHICULAR SIGHT LINES.

5. TREE TOPPING IS NOT PERMITTED.

6. ADDITIONAL SCREENING MAY BE REQUIRED IF THE INSPECTION FOR THE RELEASE OF THE PERFORMANCE SURETY REVEALS THAT THE REQUIRED SCREENING IS NOT EFFECTIVE.

7. ALL REQUIRED TREE PROTECTION FENCING SHALL BE INSTALLED AND INSPECTED BY THE CODES DEPARTMENT PRIOR TO LAND DISTURBING ACTIVITIES.

8. ANY SITE OR LANDSCAPE CHANGES (INCLUDING BUT NOT LIMITED TO A CHANGE IN DESIGN, A REDUCTION IN SIZE OR NUMBER OF PLANT MATERIAL, OR THE RELOCATION OF OVERHEAD OR UNDERGROUND UTILITIES) SHALL REQUIRE A REVISED LANDSCAPE PLAN TO BE SUBMITTED AND APPROVAL PRIOR TO THE LANDSCAPE INSTALLATION.

9. EXISTING TREES ACCEPTED IN PARTIAL COMPLIANCE OF THE LANDSCAPE REQUIREMENTS FOR THIS SITE SHALL BE ACCESSIBLE AND FLAGGED PRIOR TO ALL LANDSCAPE INSPECTIONS.

10. ANY EXISTING TREE, SHOWN AS BEING PRESERVED ON APPROVED PLANS THAT IS REMOVED, DIES OR IS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AS REQUIRED IN THE ZONING ORDINANCE.

11. SCREENING PROPOSED AROUND ANY UTILITY BOX OR TRANSFORMER IS REQUIRED TO BE EVERGREEN AND ADEQUATELY SCREEN THE OBJECT. THE PROPOSED EVERGREEN PLANT MATERIAL SHALL BE REPLACED IF IT IS NOT OF A HEIGHT SUFFICIENT TO SCREEN THE OBJECT.

12. ALL PLANT MATERIAL SHALL BE FROM THE FRANKLIN PLANT LIST UNLESS PRIOR APPROVAL IS RECEIVED FROM THE CITY.

13. ALL TREE-PROTECTION FENCING SHALL BE IN PLACE PRIOR TO THE ISSUANCE OF A GRADING PERMIT AND SHALL BE MAINTAINED IN GOOD WORKING ORDER UNTIL ALL CONSTRUCTION ACTIVITY IS COMPLETED. ANY REQUIRED EROSION CONTROL MEASURES SHALL BE PLACED OUTSIDE OF ANY TREE PROTECTION FENCING.

14. TOP SOIL USED IN ALL LANDSCAPE AREAS SHALL BE SCREENED PRIOR TO DEPOSITION IN PLANTING AREAS AND ISLANDS.

15. ANY PLANT MATERIAL LOCATED ADJACENT TO A PARKING AREA SHALL BE PLANTED SO AS TO ALLOW FOR A TWO AND A HALF FOOT VEHICULAR BUMPER OVERHANG FROM THE FACE OF CURB TO THE EDGE OF THE MATURE ADJACENT PLAN MATERIAL.

16. THE OWNER ACKNOWLEDGES THAT PLANTING LANDSCAPE MATERIAL IN A DEDICATED EASEMENT DOES NOT WAIVE OR MODIFY THE CITY OF FRANKLIN'S RIGHTS AS THE EASEMENT HOLDER. THE OWNER UNDERSTANDS THAT THE CITY OF FRANKLIN, ITS AUTHORIZED CONTRACTOR OR APPLICABLE PRIVATE UTILITY MAY AT ANY TIME AND FOR ANY REASON PERFORM WORK WITHIN THE DEDICATED EASEMENT. THE CITY, ITS AUTHORIZED CONTRACTOR OR APPLICABLE PRIVATE UTILITY SHALL HAVE NO LIABILITY TO THE OWNER FOR ANY DAMAGE TO THE LANDSCAPE MATERIAL IN THE EASEMENT WHEN SAID DAMAGE IS DUE TO WORK WITHIN THE EASEMENT. THE OWNER MAY BE HELD RESPONSIBLE FOR THE REMOVAL OF THE LANDSCAPE MATERIAL TO ENABLE WORK TO BE DONE. THE OWNER SHALL BE SOLELY RESPONSIBLE FOR ANY COST INCURRED IN REPAIRING AND/OR REPLACING THE REQUIRED LANDSCAPE MATERIAL.

LANDSCAPE PLANTING GENERAL NOTES

1. THE LANDSCAPE CONTACTOR SHALL BE RESPONSIBLE FOR CONFIRMING THE QUANITIES OF ALL MATERIALS. THE QUANTIES ON THE PLAN SHALL TAKE PRECEDENCE OVER THE PLANT LIST.

2. SUBSTITUTIONS OF TYPE, SIZE, OR SPACING OF PLANTS MAY NOT BE MADE WITHOUT PRIOR APPROVAL OF THE OWNER'S LANDSCAPE ARCHITECT, AND MAY RESULT IN THE RESUBMITTAL OF LANDSCAPE PLANS TO THE CITY OF FRANKLIN FOR APPROVAL PRIOR TO INSTALLATION.

3. ALL CONSTRUCTION ACTIVITY SHALL BE COORDINATED WITH TENNESSEE ONE CALL PRIOR TO DIGGING. ALL DAMAGE TO UTILITES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE PER UTILITY PROVIDER'S STANDARDS.

4. THE PLANT LIST SPECIFICATIONS PROVIDED WITHIN THE PLANT LIST FOR HEIGHT AND SIZE ARE MINIMUMS.

5. ALL PLANT BEDS SHALL BE RAKED AND CLEARED OF LARGE ROCKS. ALL LARGE DIRT CLODS SHALL BE PULVERIZED OR REMOVED PRIOR TO PLANTING.

6. ALL LARGE DIRT CLODS RESULTING FROM PLANTING SHALL BE PULVERIZED AND REMOVED PRIOR TO MULCHING.

7. PRE-EMERGINT HERBICIDE SHALL BE APPLIED AFTER INSTALLATION AND IMMEDIATELY PRIOR TO MULCHING.

8. ALL PLANT BEDS ARE TO BE MULCHED WITH A MINIMUM OF 4 INCHES OF SHREDDED PINE BARK. ALL ANNUAL BEDS SHALL BE MULCHED WITH A MINIMUM OF 2 INCHES OF SOIL CONDITIONER, PINE BARK FINES.

9. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANT MATERIAL OR ANY DEFECTIVE WORKMANSHIP.

10. ALL SOD AREAS SHALL BE TILLED AND RAKED SMOOTH, WITH LARGE DIRT CLODS AND ROCKS REMOVED, PRIOR TO SOD INSTALLATION.

11. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL STAKING AND LAYOUT OF PLANT BEDS.

12. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE DRAINAGE OF ALL TREE AND SHRUB PITS. A PVC OR GRAVEL SUMP AT THE BASE OF THE TREE WELL MAY BE REQUIRED IN AREAS WHERE CLAY SOILS DO NOT ADEQUATELY DRAIN.

13. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT WHEN THE PLANT MATERIALS ARE AT THE JOB SITE FOR REVIEW PRIOR TO INSTALLATION.

CITY OF FRANKLIN MINIMUM PLANT QUALITY AND SIZE STANDARDS

1. ALL NEWLY PLANTED LANDSCAPE PLANT MATERIALS SHALL CONFORM TO THE LATEST VERSIONS OF THE AMERICAN STANDARD OF NURSERY STOCK (ANSI Z60.

2. ALL TYPE 1, 2, AND 3 TREES (AS DEFINED IN ANSI Z60.1) USED TO MEET THE REQUIREMENTS OF THIS SUBSECTION SHALL HAVE THE FOLLOWING CHARACTERISTICS:

A. DECIDUOUS TREES SHALL HAVE ONE DOMINANT TRUNK WITH THE TIP OF THE LEADER ON THE MAIN TRUNK LEFT INTACT AND THE TERMINAL BUD ON THE CENTRAL LEADER AT THE HIGHEST POINT ON THE TREE.

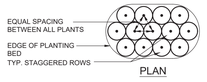
B. TREES WITH FORKED TRUNKS ARE ACCEPTABLE IF ALL THE FOLLOWING CONDITIONS ARE MET:
   1. THE FORK OCCURS IN THE UPPER ONE-THIRD OF THE TREE.
   2. ONE FORK IS LESS THAN TWO-THIRDS OF THE TREE.
   3. THE TOP ONE-THIRD OF THE SMALLER FORK IS REMOVED AT THE TIME OF PLANTING.

C. NO BRANCH IS GREATER THAN TWO-THIRDS THE DIAMETER OF THE TRUNK DIRECTLY ABOVE THE BRANCH.

D. SEVERAL BRANCHES ARE LAGER IN DIAMETER AND OBVIOUSLY MORE DOMINANT.

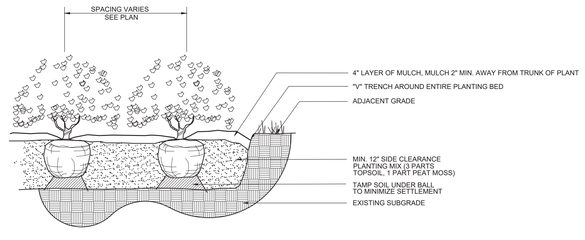
E. BRANCHING HABIT IS MORE HORIZONTAL THAN VERTICAL AND NO BRANCHES ARE ORIENTED NEARLY VERTICAL TO THE TRUNK.

F. BRANCHES ARE EVENLY DISTRIBUTED AROUND THE TRUNK WITH NO MORE THANK ONE MAJOR BRANCH LOCATED DIRECTLY ABOVE ANOTHER AND THE CROWN IS FULL OF FOLIAGE THAT IS EVENLY DISTRIBUTED AROUND THE TREE.

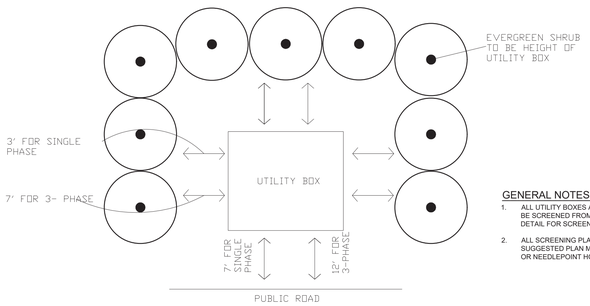


GENERAL NOTES:

1. Install top of plant ball shall be level with finished grade.
2. Tamp planting mix firmly as pit is filled around each plant ball.
3. Soak each plant ball and pit immediately after installation.
4. Cut and remove burlap from top 1/3 of root ball. Non-degradable burlap shall be removed or rolled under ball after replacement of plant.



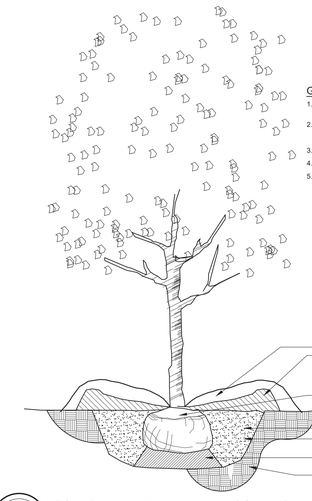
1 / L3.0 — SHRUB PLANTING — PLAN/ SECTION — DETAIL # NTS



GENERAL NOTES:

1. ALL UTILITY BOXES AND METERS MUST BE SCREENED FROM VIEW. PLEASE USE THIS STANDARD DETAIL FOR SCREENING REQUIREMENTS.
2. ALL SCREENING PLAN MATERIAL SHALL BE EVERGREEN. SUGGESTED PLAN MATERIAL TO INCLUDE: INKBERRY HOLLY OR NEEDLEPOINT HOLLY.

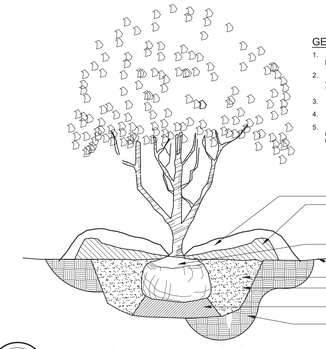
2 / L3.0 — UTILITY BOX SCREEN — NTS



GENERAL NOTES:

1. All trees are to be nursery grown, burlap and ball (B&B). Minimum tree size is per schedule (measured 6" above root ball).
2. Remove all treated or plastic-coated burlap, strapping, wire or nylon twine from root ball. After setting in hole, cut away top and sides of wire basket, if any.
3. Install top of plant ball even with or 1" above existing grade.
4. No staking of trees permitted..
5. Soak plant ball and pit immediately after installation. Place 4-6" of seasoned mulch or pine needles around base of tree, 3' diameter minimum; mulch shall be a minimum of 3" from the trunk.

3 / L3.0 — SINGLE TRUNK DECIDUOUS TREE — SECTION — DETAIL # NTS



GENERAL NOTES:

1. All trees are to be nursery grown, burlap and ball (B&B). Minimum tree size is per schedule (measured 6" above root ball).
2. Remove all treated or plastic-coated burlap, strapping, wire or nylon twine from root ball. After setting in hole, cut away top and sides of wire basket, if any.
3. Install top of plant ball even with or 1" above existing grade.
4. No staking of trees permitted..
5. Soak plant ball and pit immediately after installation. Place 4-6" of seasoned mulch or pine needles around base of tree, 3' diameter minimum; mulch shall be a minimum of 3" from the trunk.

4 / L3.0 — UNDERSTORY TREE — SECTION — DETAIL # NTS

LANDSCAPE DETAILS AND NOTES

Kimley»Horn
209 Tenth Avenue South, Suite 501
Nashville, TN 37203
Main: 615.564.2701
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GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER
FRANKLIN, TENNESSEE

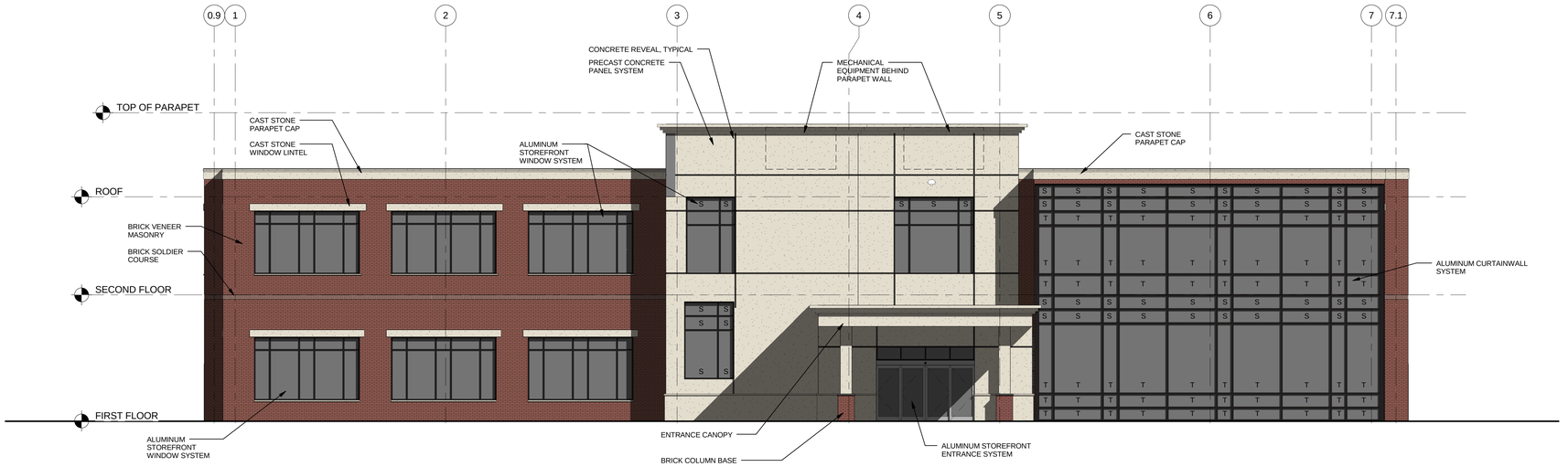
GREGORY C. GAMBLE — REGISTERED LANDSCAPE ARCHITECT

No.	REVISIONS	DATE	BY
1	CITY OF FRANKLIN COMMENTS	4.7.2016	

DESIGNED BY: RJA
DRAWN BY: RJA
CHECKED BY: RLM
DATE: 8/10/2015
KHA PROJECT NO. 118133000

LANDSCAPE DETAILS

SHEET NUMBER
L3-00
COF# 6076

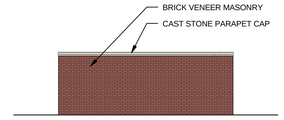


WEST ELEVATION

SCALE: 1/8" = 1'-0"

1

WEST ELEVATION		
TYPE	SURFACE AREA	PERCENTAGE
BRICK	1573.11	23.88
CAST STONE	345.42	5.24
ARCHITECTURAL PRECAST	1738.43	26.39
WINDOWS/DOORS	2929.70	44.48
TOTAL:	6586.66	

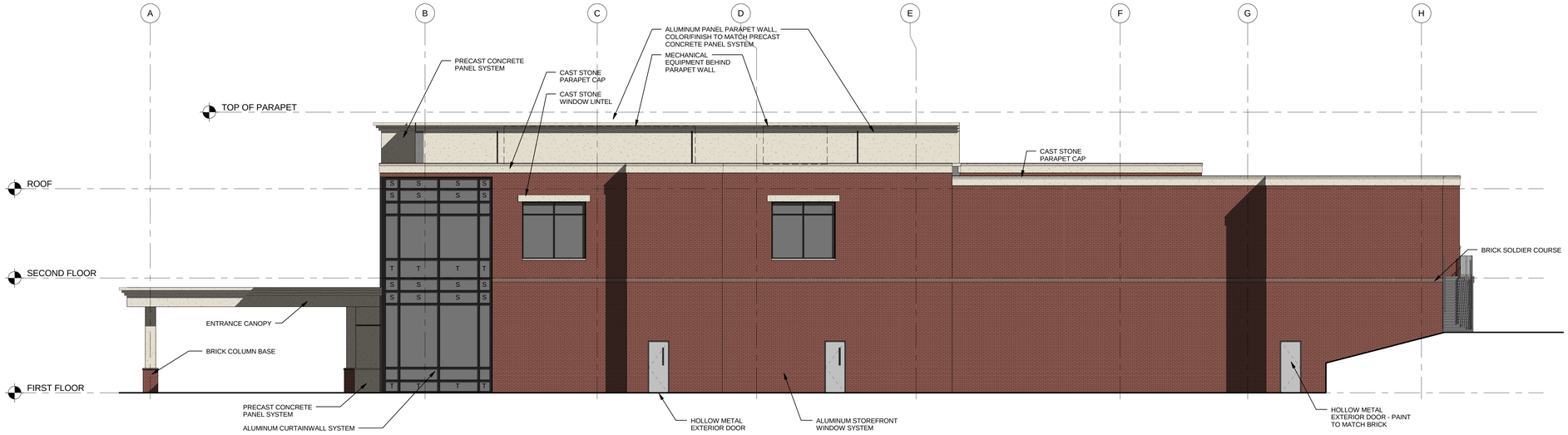


DUMPSTER ENCLOSURE ELEVATION

SCALE: 1/8" = 1'-0"

2

EXTERIOR ELEVATION GENERAL...	
1	"CJ" DENOTES CONTROL JOINT. REFER TO DETAIL X/X.XX.
2	"SJ" DENOTES EIFS SCORE JOINT. REFER TO DETAIL X/X.XX.
3	"EJ" DENOTES EXPANSION CONTROL JOINT. REFER TO DETAIL X/X.XX.
4	"AR" DENOTES AESTHETIC REVEAL. REFER TO DETAIL X/X.XX.
5	"S" DENOTES SPANDREL GLAZING.
6	"T" DENOTES TEMPERED GLAZING.

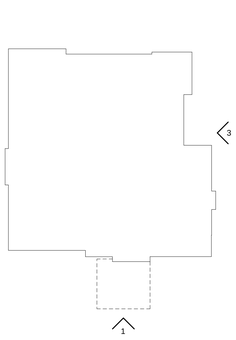


SOUTH ELEVATION

SCALE: 1/8" = 1'-0"

3

SOUTH ELEVATION		
TYPE	SURFACE AREA	PERCENTAGE
BRICK	4576.42	67.52
CAST STONE	510.65	7.53
ARCHITECTURAL PRECAST	763.01	11.26
WINDOWS/DOORS	927.78	13.69
TOTAL:	6777.86	



THESE ELEVATIONS HAVE BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN'S ARCHITECTURAL DESIGN STANDARDS AND THE APPROVAL OF THE PLANNING COMMISSIONCITY OF FRANKLIN. CHANGES SHALL NOT BE MADE TO THE APPROVED ELEVATIONS UNLESS APPROVED BY EITHER THE BNS DIRECTOR OR THE PLANNING COMMISSION.

MBI
michael brady inc.
architecture · engineering · interiors
209 N. WEISGARBER RD.
KNOXVILLE, TENNESSEE 37919
PHONE: 865 584 0999
FAX: 865 584 6213
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BRIAN D. PIERCE
REGISTERED ARCHITECT
STATE OF TENNESSEE
No. 101737
4/6/16

SCOTT HAMILTON CENTER FOR PROTON THERAPY

A NEW BUILDING FOR:

FRANKLIN, TENNESSEE

THIS DRAWING HAS BEEN ISSUED:

- ☐ FOR REVIEW ONLY
- ☐ FOR PERMITTING ONLY
- ☐ SCHEMATIC DESIGN
- ■ DESIGN DEVELOPMENT
- ☐ CONSTRUCTION DOCUMENTS

Drawing Title:
EXTERIOR ELEVATIONS

Date: 03/14/2016

Designed By: B.D.P.
Drawn By: T.D.B.
Reviewed By: C.M.G.

Comm. No. 160221

Revisions:

Sheet: of

Sheet No. A4.1

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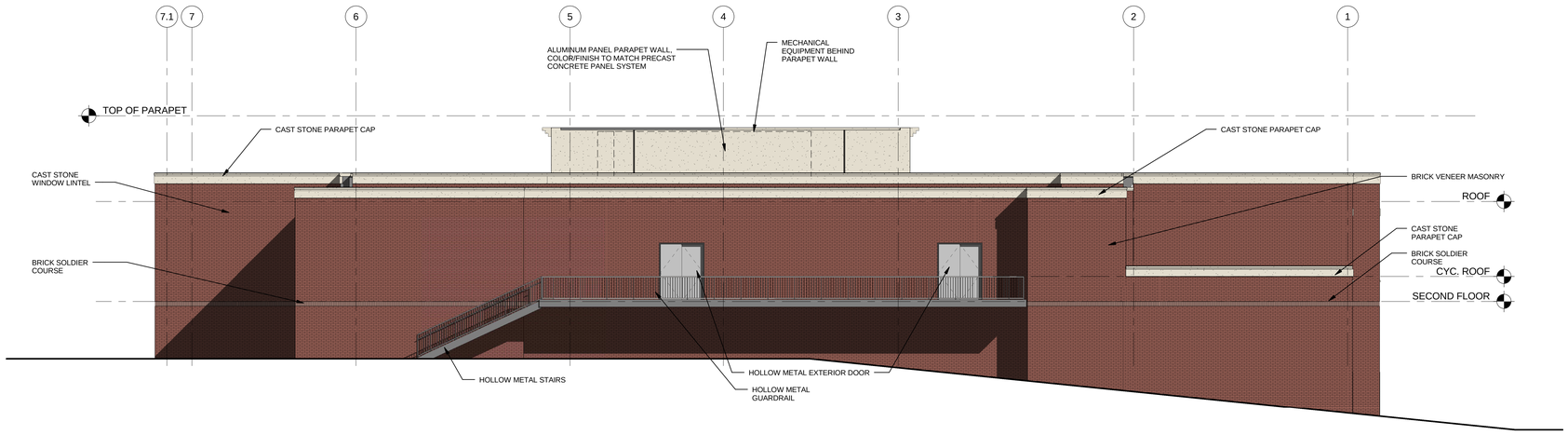
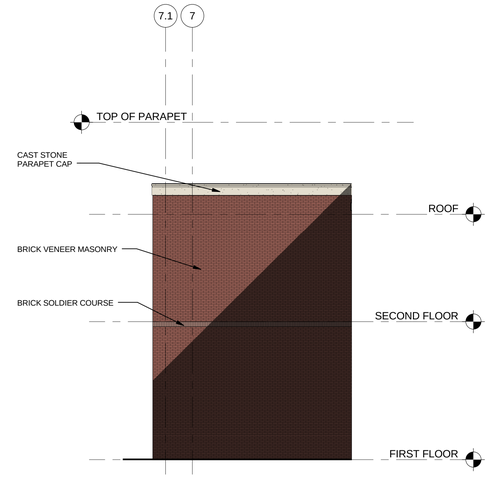


EAST ELEVATION - A

SCALE: 1/8" = 1'-0"

1



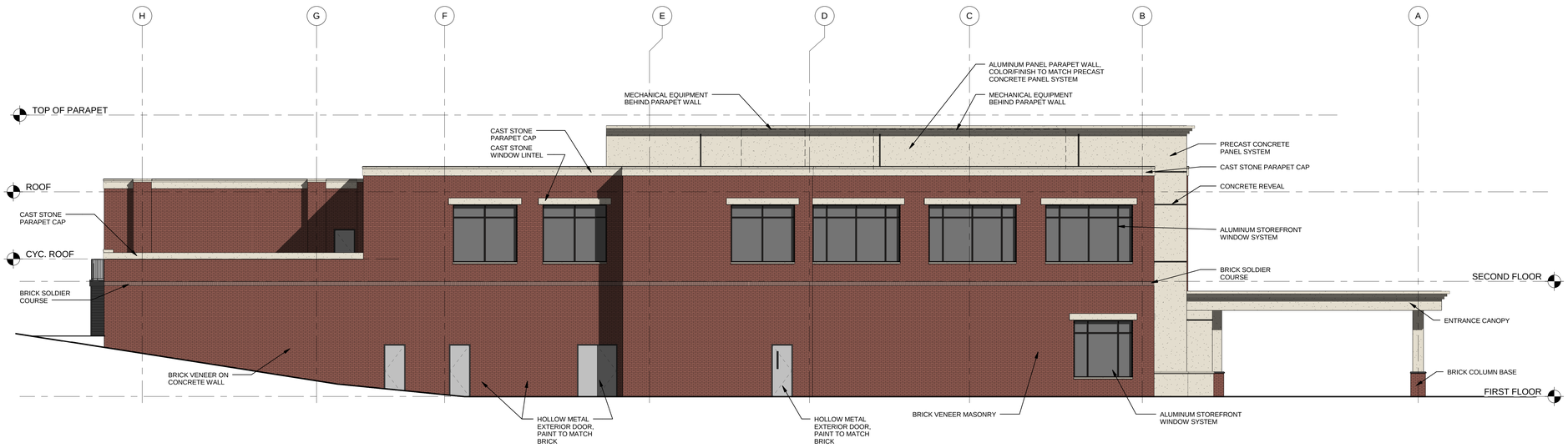
EAST ELEVATION - B

SCALE: 1/8" = 1'-0"

2

EAST ELEVATION

TYPE	SURFACE AREA	PERCENTAGE
BRICK	4120.59	80.65
CAST STONE	545.29	10.67
ARCHITECTURAL PRECAST	344.09	6.73
WINDOWS/DOORS	99.29	1.94
TOTAL:	5109.26	



NORTH ELEVATION

SCALE: 1/8" = 1'-0"

3

NORTH ELEVATION

TYPE	SURFACE AREA	PERCENTAGE
BRICK	4375.70	65.60
CAST STONE	446.27	6.69
ARCHITECTURAL PRECAST	948.34	14.22
WINDOWS/DOORS	900.42	13.50
TOTAL:	6670.73	

EXTERIOR ELEVATION GENERAL...

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2	"SJ" DENOTES EIFS SCORE JOINT. REFER TO DETAIL X/X.XX.
3	"EJ" DENOTES EXPANSION CONTROL JOINT. REFER TO DETAIL X/X.XX.
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5	"S" DENOTES SPANDREL GLAZING.
6	"T" DENOTES TEMPERED GLAZING.

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BRIAN D. PIERCE
REGISTERED ARCHITECT
4/6/16
STATE OF TENNESSEE

SCOTT HAMILTON CENTER FOR PROTON THERAPY
A NEW BUILDING FOR:
FRANKLIN, TENNESSEE

THIS DRAWING HAS BEEN ISSUED:
- ☐ FOR REVIEW ONLY
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- ☐ SCHEMATIC DESIGN
- ■ DESIGN DEVELOPMENT
- ☐ CONSTRUCTION DOCUMENTS

Drawing Title:
EXTERIOR ELEVATIONS

Date: 03/14/2016

Designed By: B.D.P.
Drawn By: T.D.B.
Reviewed By: C.M.G.

Comm. No. 160221

Revisions:

Sheet: of | Sheet No. A4.2

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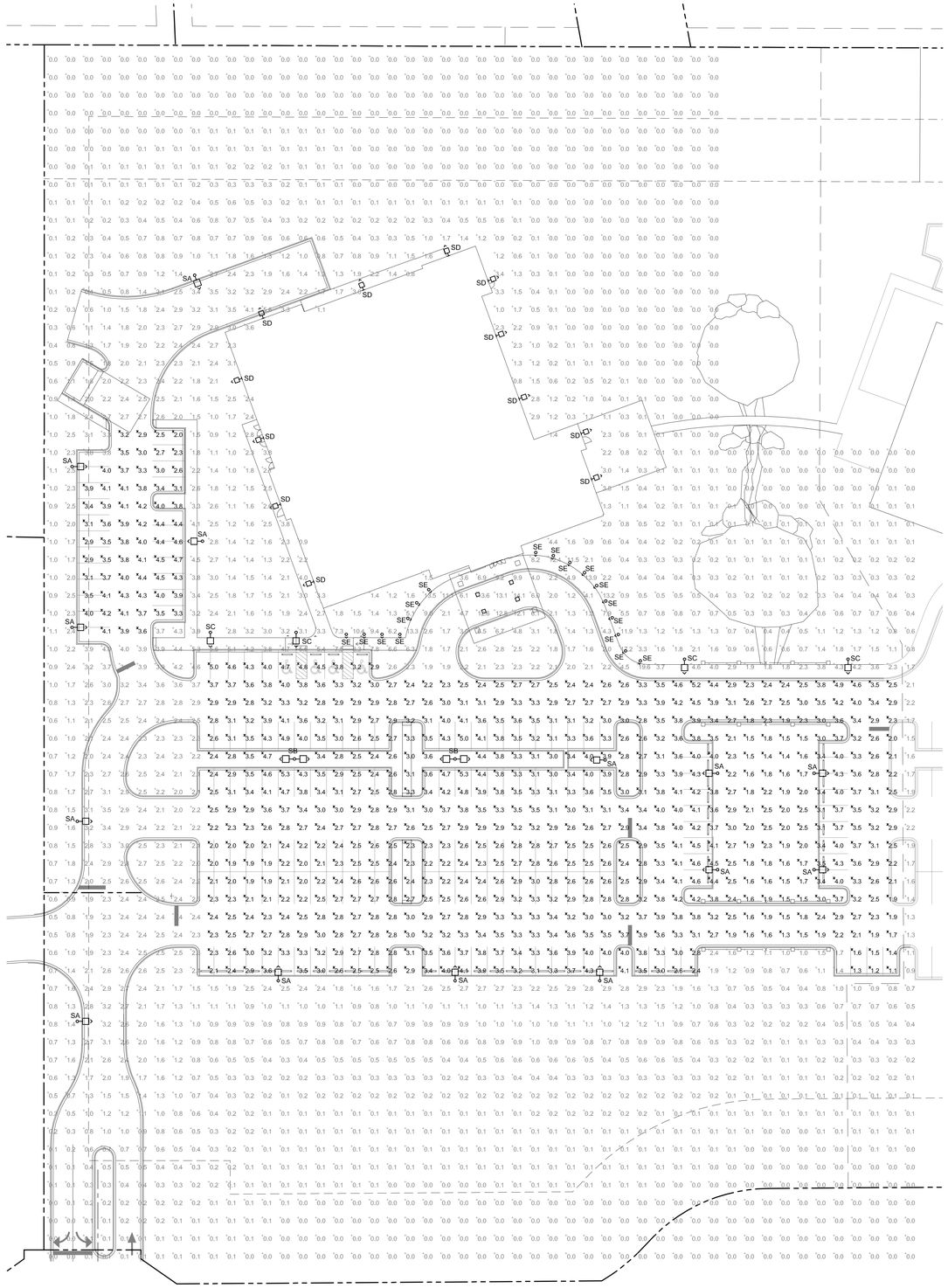


SITE PLAN - PHOTOMETRIC

SCALE: 1" = 30'-0"

1

PHOTOMETRIC SUMMARY													
PROJECT: OVIEDO FL, CANCER TREATMENT CENTER													
LABEL	SYMBOL	AVG		MAX		MIN		MAX/MIN	AVG/MIN	L.L.F.
CALC ZONE	+	1.5	FC	19.6	FC	0.0	FC	N/A	N/A	0.95
PARKING FRONT	*	3.0	FC	5.5	FC	1.1	FC	5.0 : 1	2.7 : 1	0.95
PARKING SIDE	*	3.7	FC	4.7	FC	2.0	FC	2.4 : 1	1.9 : 1	0.95

NOTES:

1. SEE SHEET E0.1 FOR ELECTRICAL LEGEND AND GENERAL NOTES.
2. MOUNT FIXTURES SO THAT LIGHT IS DIRECTED IN THE DIRECTION OF THE ARROWS SHOWN ON THIS PLAN.
3. LIGHTING SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF ALL COUNTY AND CITY CODES.

SITE LIGHTING FIXTURE SCHEDULE

TYPE	LAMP	NO.	WATTS	VOLTS	MOUNTING	HEIGHT	MANUFACTURER	CATALOG NO.	REMARKS
SA	LED	1	188	208	POLE	28'-0"	LITHONIA	DSX2-LED-80C-700-40K-T3M-MVOLT-SPA-HS-DDBXD	DARK SKIES LED AREA LIGHT. COLOR: DARK BRONZE
SB	LED	2	188	208	POLE	28'-0"	LITHONIA	DSX2-LED-80C-700-40K-T3M-MVOLT-SPA-DDBXD	DARK SKIES LED AREA LIGHT. 2@180°. COLOR: DARK BRONZE
SC	LED	1	68	208	POLE	16'-0"	LITHONIA	DSX1-LED-80C-700-40K-T2M-MVOLT-SPA-DDBXD	DARK SKIES LED AREA LIGHT. COLOR: DARK BRONZE
SD	LED	1	47	208	POLE	10'-0"	LITHONIA	WSQ-LED-2-10A700/40K-SR3-MVOLT-ELCW	DARK SKIES LED WALL PACK. COLOR: DARK BRONZE
SE	LED	1	31	208	GRADE	42"	LITHONIA	DSXB-LED-12C-700-40K-ASY	DARK SKIES LED BOLLARD. COLOR: DARK BRONZE
P1							HAPCO	SSA25F5-4-BM (FOR FIXTURE TYPE "SA" & "SB")	25'-0" SQUARE STRAIGHT ALUMINUM POLE. COLOR: DARK BRONZE
P2							HAPCO	SSA16D4-4-BM (FOR FIXTURE TYPE "SC")	16'-0" SQUARE STRAIGHT ALUMINUM POLE. COLOR: DARK BRONZE

NOTES:
1. FURNISH AND INSTALL LAMPS FOR ALL FIXTURES
2. ---
3. ---

D-Series Size 2
LED Area Luminaire

d*series

Catalog Number
Notes
Type
"SA" & "SB"

Specifications
EPA: 1.1 ft² (0.10 m²)
Length: 40" (101.6 cm)
Width: 15" (38.1 cm)
Height: 7-1/4" (18.4 cm)
Weight (max): 36 lbs (16.3 kg)

Introduction
The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.
The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. The Size 2 is ideal for replacing 400-1000W metal halide in area lighting applications with energy savings of up to 80% and expected service life of over 100,000 hours.

Ordering Information
EXAMPLE: DSX2 LED 80C 1000 40K T4M MVOLT SPA DDBXD

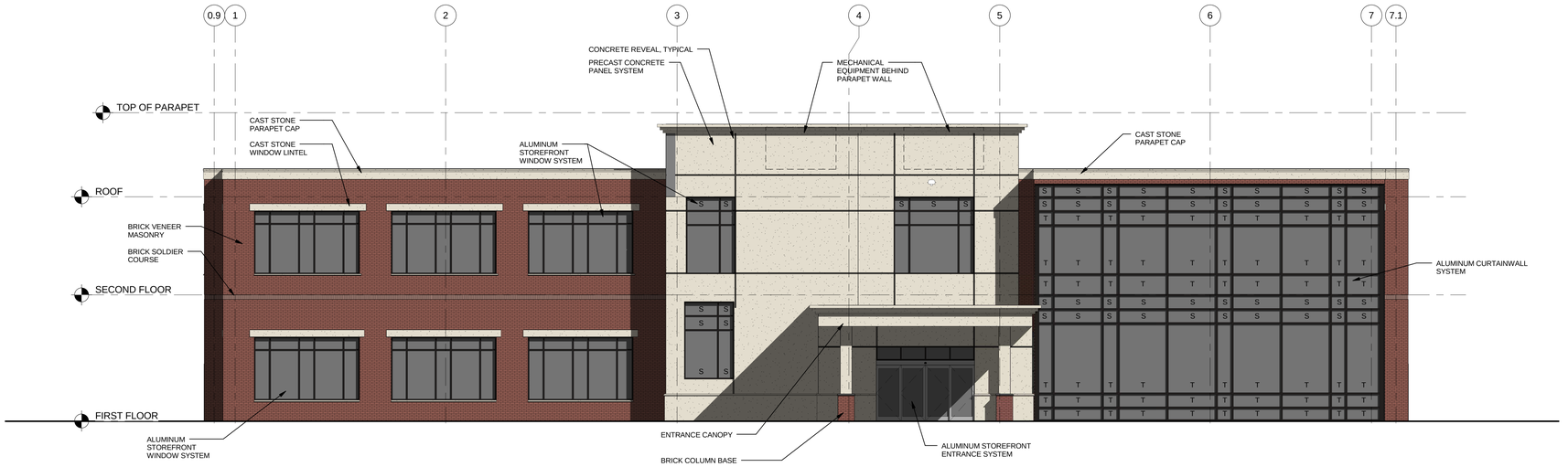
DSX2 LED

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting
DSX2 LED	Forward optics 80C 80 LEDs (Dual engine) 100C 100 LEDs (Dual engine) Rotated optics 90C 90 LEDs	530 530 mA 700 700 mA 1000 1000 mA (1 A) 1200 1200 mA (1.2 A)	30K 3000K 40K 4000K 50K 5000K AMBPC Amber phosphor converted	T1S Type I Short T2S Type II Short T2M Type II Medium T3S Type III Short T3M Type III Medium T4M Type IV Medium TFTM Forward Throw Medium T5VS Type V Very Short T5S Type V Short T5W Type V Wide	MVOLT 1 120 1 208 1 240 1 277 1 347 1 480 1	Shipped included SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor 2 RPUMBA Round pole universal mounting adaptor 2 Shipped separately KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish) 3

Control options	Other options	Finish (required)
Shipped installed PER NEMA® twist-lock receptacle only (no controls) 4 PERS Five-wire receptacle only (no controls) 4 PE57 Seven-wire receptacle only (no controls) 4,5 DMG 0-10V dimming driver (no controls) 6 DCR Dimmable and controllable via ROAM® (no controls) 7 DS Dual switching 8,9 PIR Motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc 9,10,11 PIRH Motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 5fc 9,10,11	BL30 Bi-level switched dimming, 30% 9,10 BL50 Bi-level switched dimming, 50% 9,10 PIRBTDDBXD Part night, dim till 6am 9 PIRBTZ1 Part night, dim 3 hrs 9 PIRBTZ2 Part night, dim 4 hrs 9 PIRBTZ3 Part night, dim 7 hrs 9 FAO Field Adjustable Output 12	Shipped installed HS House-side shield 13 SF Single fuse (120, 277, 347V) 14 DF Double fuse (208, 240, 480V) 14 L90 Left rotated optics 15 R90 Right rotated optics 15 DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DSSTXD Sandstone DDBTXD Textured dark bronze DBLBTXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white DSSTXD Textured sandstone

Template #8 Top of Pole
Drilling
Accessories
Tenon Mounting Slipfitter **

Controls & Shields
BLL3T (3-5) Network - 3fc multi-level, 3@ 20 ft 17
BLL3TR (3-5) EL Network - 3fc multi-level, 3@ 20 ft, emergency 17
BLL4SBT (3-5) EL IM Network - 3fc multi-level, 4@ 8ft 17
BSGDBC 10 in Bronze color shroud 18
BSGDBC 10 in Black color shroud 18
BSGDBC 10 in White color shroud 18
PUMBA DDBXD Square pole universal mounting adaptor (specify finish) 3
RPUMBA DDBXD Round pole universal mounting adaptor (specify finish) 3
Not rotatable - requires 90° luminaire for proper operation.
Not rotatable - requires 180° luminaire for proper operation.
Not rotatable - requires 270° luminaire for proper operation.
Not rotatable - requires 360° luminaire for proper operation.
Not rotatable - requires 360° luminaire for proper operation.
Not rotatable - requires 360

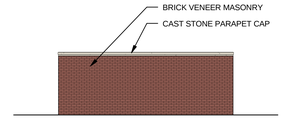


WEST ELEVATION

SCALE: 1/8" = 1'-0"

1

WEST ELEVATION		
TYPE	SURFACE AREA	PERCENTAGE
BRICK	1573.11	23.88
CAST STONE	345.42	5.24
ARCHITECTURAL PRECAST	1738.43	26.39
WINDOWS/DOORS	2929.70	44.48
TOTAL:	6586.66	

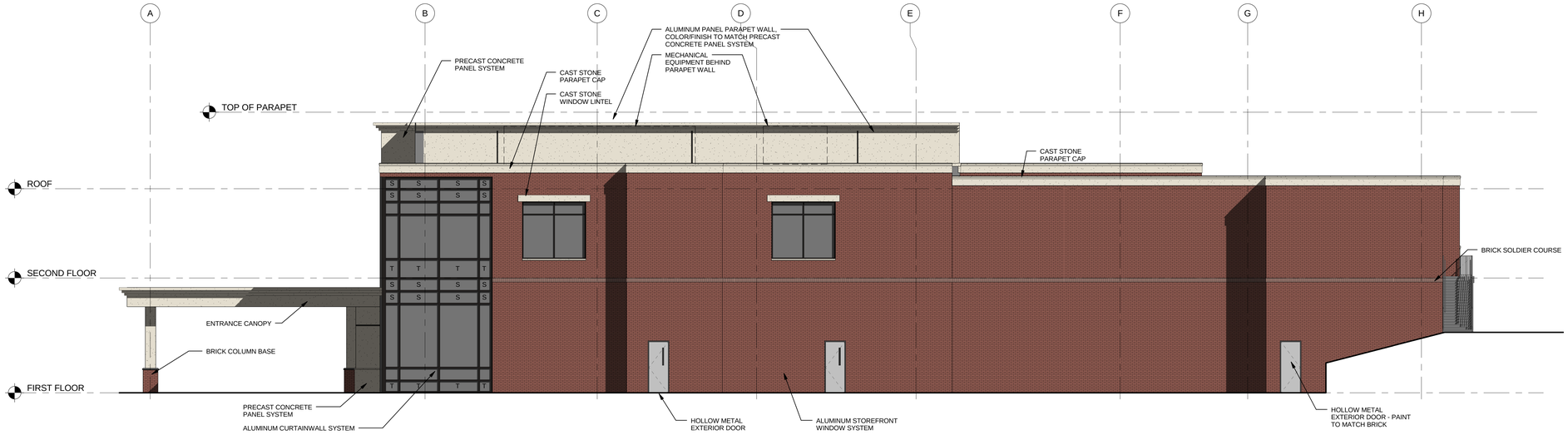


DUMPSTER ENCLOSURE ELEVATION

SCALE: 1/8" = 1'-0"

2

EXTERIOR ELEVATION GENERAL...	
1	"CJ" DENOTES CONTROL JOINT. REFER TO DETAIL X/X.XX.
2	"SJ" DENOTES EIFS SCORE JOINT. REFER TO DETAIL X/X.XX.
3	"EJ" DENOTES EXPANSION CONTROL JOINT. REFER TO DETAIL X/X.XX.
4	"AR" DENOTES AESTHETIC REVEAL. REFER TO DETAIL X/X.XX.
5	"S" DENOTES SPANDREL GLAZING.
6	"T" DENOTES TEMPERED GLAZING.

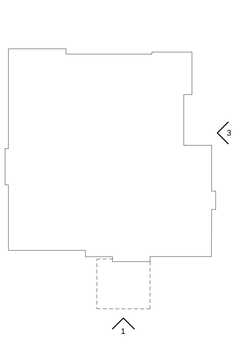


SOUTH ELEVATION

SCALE: 1/8" = 1'-0"

3

SOUTH ELEVATION		
TYPE	SURFACE AREA	PERCENTAGE
BRICK	4576.42	67.52
CAST STONE	510.65	7.53
ARCHITECTURAL PRECAST	763.01	11.26
WINDOWS/DOORS	927.78	13.69
TOTAL:	6777.86	



THESE ELEVATIONS HAVE BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN'S ARCHITECTURAL DESIGN STANDARDS AND THE APPROVAL OF THE PLANNING COMMISSIONCITY OF FRANKLIN. CHANGES SHALL NOT BE MADE TO THE APPROVED ELEVATIONS UNLESS APPROVED BY EITHER THE BNS DIRECTOR OR THE PLANNING COMMISSION.

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www.michaelbradyinc.com

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BRIAN D. PIERCE
REGISTERED ARCHITECT
STATE OF TENNESSEE
No. 101737
4/6/16

SCOTT HAMILTON CENTER FOR PROTON THERAPY

A NEW BUILDING FOR:

FRANKLIN, TENNESSEE

THIS DRAWING HAS BEEN ISSUED:

- ☐ FOR REVIEW ONLY
- ☐ FOR PERMITTING ONLY
- ☐ SCHEMATIC DESIGN
- ■ DESIGN DEVELOPMENT
- ☐ CONSTRUCTION DOCUMENTS

Drawing Title:
EXTERIOR ELEVATIONS

Date: 03/14/2016

Designed By: B.D.P.
Drawn By: T.D.B.
Reviewed By: C.M.G.

Comm. No. 160221

Revisions:

Sheet: of

Sheet No. A4.1

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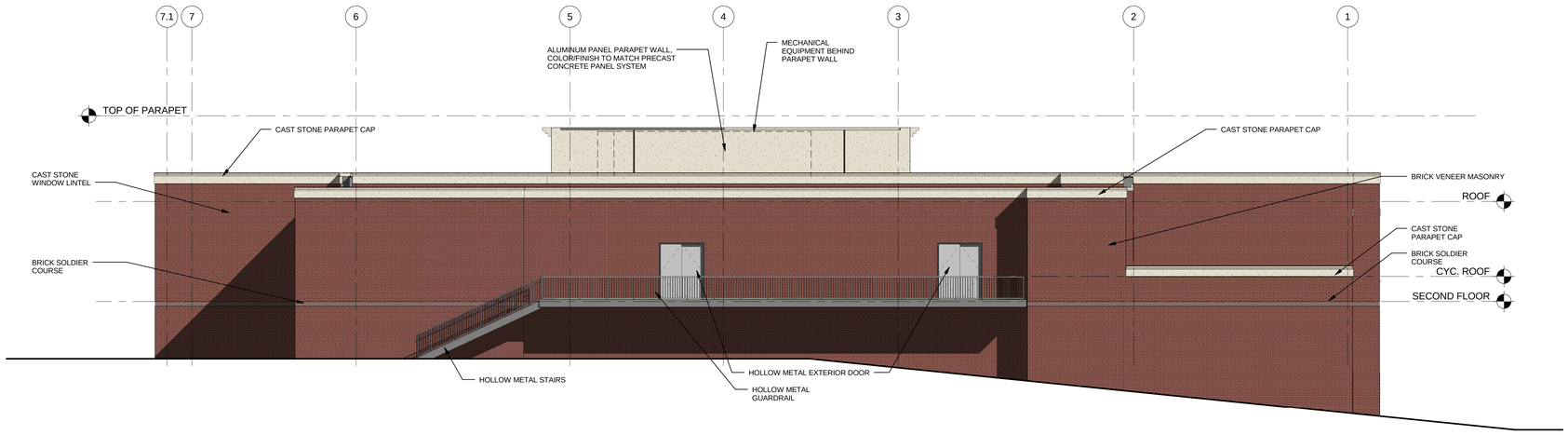
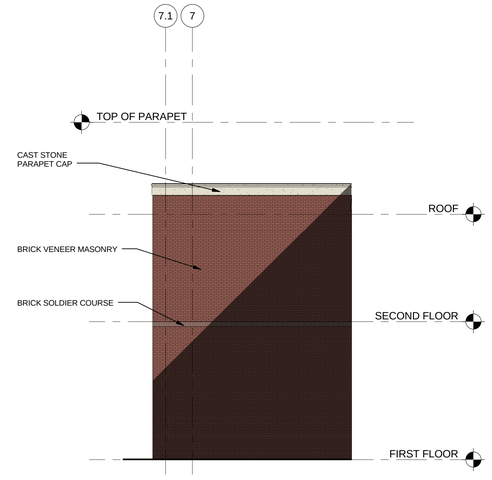


EAST ELEVATION - A

SCALE: 1/8" = 1'-0"

1



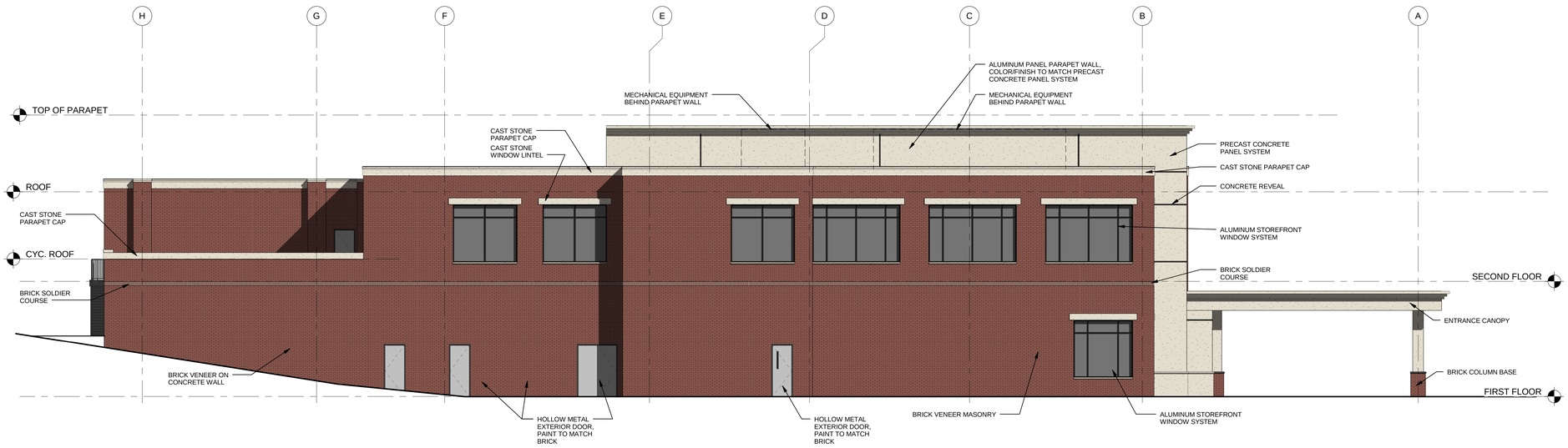
EAST ELEVATION - B

SCALE: 1/8" = 1'-0"

2

EAST ELEVATION

TYPE	SURFACE AREA	PERCENTAGE
BRICK	4120.59	80.65
CAST STONE	545.29	10.67
ARCHITECTURAL PRECAST	344.09	6.73
WINDOWS/DOORS	99.29	1.94
TOTAL:	5109.26	



NORTH ELEVATION

SCALE: 1/8" = 1'-0"

3

NORTH ELEVATION

TYPE	SURFACE AREA	PERCENTAGE
BRICK	4375.70	65.60
CAST STONE	446.27	6.69
ARCHITECTURAL PRECAST	948.34	14.22
WINDOWS/DOORS	900.42	13.50
TOTAL:	6670.73	

EXTERIOR ELEVATION GENERAL...

1	"CJ" DENOTES CONTROL JOINT. REFER TO DETAIL X/X.XX.
2	"SJ" DENOTES EIFS SCORE JOINT. REFER TO DETAIL X/X.XX.
3	"EJ" DENOTES EXPANSION CONTROL JOINT. REFER TO DETAIL X/X.XX.
4	"AR" DENOTES AESTHETIC REVEAL. REFER TO DETAIL X/X.XX.
5	"S" DENOTES SPANDREL GLAZING.
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BRIAN D. PIERCE
REGISTERED ARCHITECT
4/6/16
STATE OF TENNESSEE

SCOTT HAMILTON CENTER FOR PROTON THERAPY
A NEW BUILDING FOR:
FRANKLIN, TENNESSEE

THIS DRAWING HAS BEEN ISSUED:
- ☐ FOR REVIEW ONLY
- ☐ FOR PERMITTING ONLY
- ☐ SCHEMATIC DESIGN
- ■ DESIGN DEVELOPMENT
- ☐ CONSTRUCTION DOCUMENTS

Drawing Title:
EXTERIOR ELEVATIONS

Date: 03/14/2016

Designed By: B.D.P.
Drawn By: T.D.B.
Reviewed By: C.M.G.

Comm. No. 160221

Revisions:

Sheet: of | Sheet No. A4.2

A360.0/160221 - Scott Hamilton Center for Proton Therapy\160221-arch.rvt
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SITE DATA CHART

PROJECT NAME:	SCOTT HAMILTON PROTON THERAPY CENTER
COF PROJECT #:	6076
SUBDIVISION:	MEDCORE MEDICAL BLDG
MAP:	MAP # 79
PARCEL #:	48.04
LOT:	3
ADDRESS:	4588 CAROTHERS PARKWAY
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
EXISTING ZONING:	GENERAL OFFICE DISTRICT
CHARACTER AREA OVERLAY:	McEWEN 5
OTHER APPLICABLE OVERLAYS:	N/A
DEVELOPMENT STANDARD:	CONVENTIONAL
ACREAGE OF SITE:	11.62 AC
SQUARE FOOTAGE OF SITE:	506,335 SF
OWNER:	MTPC LLC 1400 DOWELL SPRINGS BLVD #350 KNOXVILLE, TN 37909
DEVELOPER:	PROVISION SOLUTIONS ANDY LORENZ 1400 DOWELL SPRINGS BLVD., SUITE 350 KNOXVILLE, TN 37909 (865)321-4701
APPLICANT:	KIMLEY-HORN & ASSOCIATES
Address:	214 OCEANSIDE DRIVE NASHVILLE, TN 37204
Phone:	615-564-2701
Email:	RYAN.MCMASTER@KIMLEY-HORN.COM
Contact Name:	RYAN McMASTER
BUILDING SETBACKS:	FRONT=50'; SIDE=25'; REAR=40';
BUILDING SQUARE FOOTAGE:	101,501 SF
PH. 1 BUILDING AREA:	30,804 SF (2-STORY MEDICAL OFFICE) 9,647 SF (PROTON VAULT)
FUTURE BUILDING AREA:	± 61,050 SF (3-STORY MEDICAL OFFICE)
BUILDING HEIGHT:	± 44'
MINIMUM LANDSCAPE SURFACE RATIO:	0.30 (2.07 AC PHASE 1)
PROVIDED LANDSCAPE SURFACE RATIO:	0.52 (3.58 AC PHASE 1)
MINIMUM PARKING REQUIREMENT:	N/A
EXISTING PARKING:	N/A
PARKING PROVIDED:	149 TOTAL SPACES 145 STANDARD SPACES 4 ADA SPACES 0 COMPACT SPACES
EXISTING TREE CANOPY:	9.58 AC EXISTING (82% OF TOTAL SITE)
TREE CANOPY PRESERVATION REQUIRED:	1.44 AC (15% OF TOTAL SITE)
TREE CANOPY PRESERVATION PROVIDED:	1.52 AC (16% OF TOTAL SITE)
PARKLAND(IF APPLICABLE):	N/A
OPEN SPACE REQUIRED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)
OPEN SPACE PROVIDED:	ALL FORMAL - 0.35 AC (5% OF PHASE 1)

NOTES:

1. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
2. THIS SITE PLAN HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE CITY OF FRANKLIN STANDARDS AND THE APPROVAL OF PLANNING COMMISSION. CHANGES SHALL NOT BE MADE TO THE APPROVED SITE PLAN UNLESS APPROVED BY EITHER RELEVANT DEPARTMENT SUPERINTENDENT OR THE PLANNING COMMISSION.
3. THE INFORMATION SHOWN ON THIS PLAN IS BASED UPON THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FLIPZONE 4100 AND NAD 83 DATUM.
4. BASE INFORMATION WAS TAKEN FROM A TOPOGRAPHIC SURVEY PREPARED BY LITTLEJOHN, DATED MARCH 23, 2015. KIMLEY-HORN AND ASSOCIATES SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF THE BASE INFORMATION SHOWN.
5. THE CONSULTANT HAS FOUND NO EVIDENCE OF THE MINERAL RIGHTS OF THIS PROPERTY BEING TRANSFERRED TO ANY PARTY OTHER THAN THE OWNER.
6. THIS PROJECT DOES NOT PROPOSE FILL WITHIN THE EXISTING FLOODPLAIN. NO BUILDINGS IN THIS PROJECT FALL WITHIN THE 100 YEAR FLOODPLAIN, PER THE FEMA FIRM MAP NUMBER 47187C0212F, DATED SEPTEMBER 29, 2006

NOTES:

1. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
2. ALL PAVEMENT SHOWN OUTSIDE OF THE HEAVY DUTY AREAS SHALL BE LIGHT DUTY ASPHALT PAVEMENT.

PAVEMENT LEGEND

CONCRETE

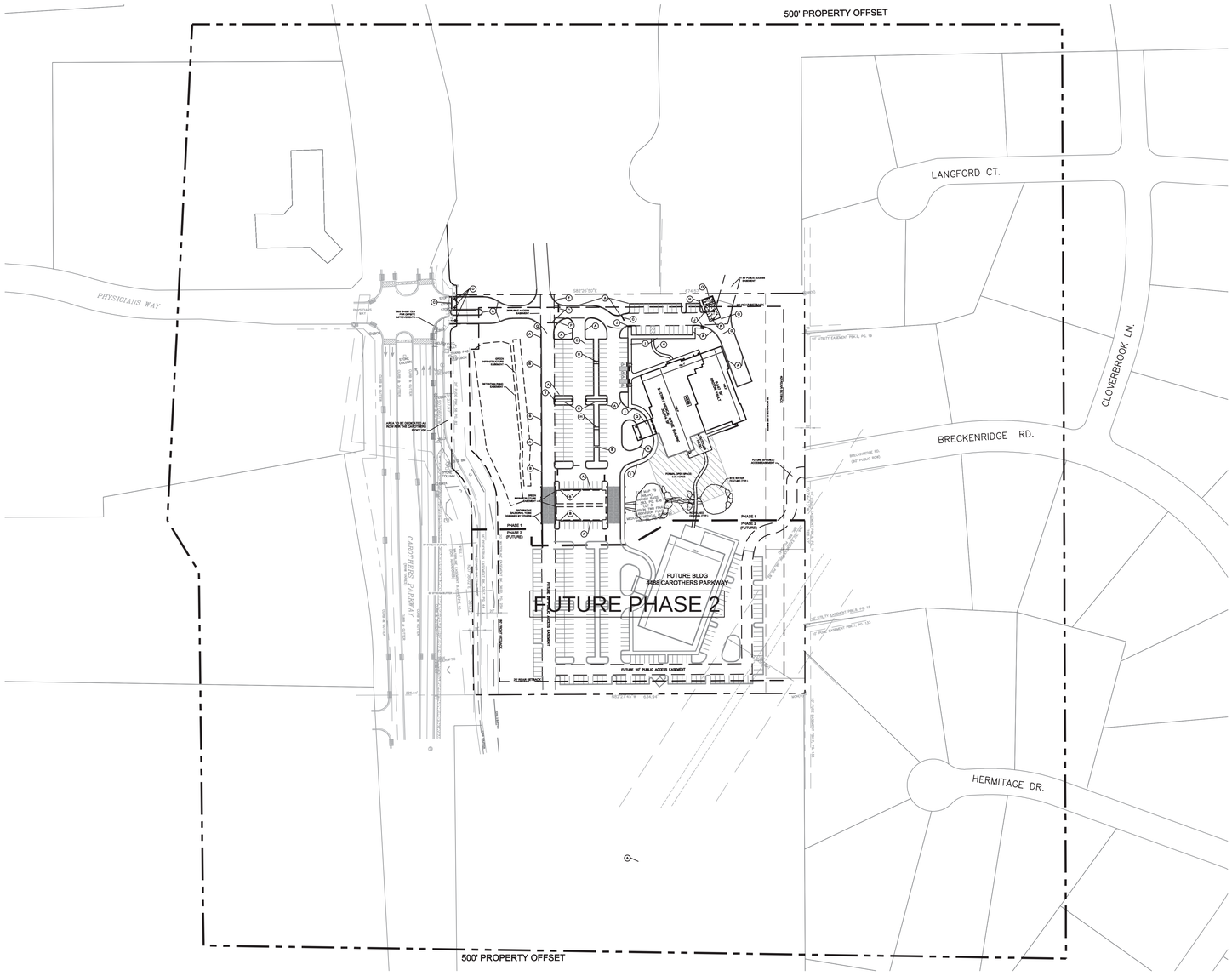
HEAVY DUTY PAVEMENT

LINE TABLE		
LINE	LENGTH	BEARING
L1	24.50'	N42°25'25"E
L2	5.00'	S82°25'54"E
L3	54.27'	N07°34'06"E

CURVE TABLE						
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD	CHD BEARING
C1	77.04'	92.00'	47°58'48"	40.94'	74.81'	N16°51'24"W
C2	32.84'	108.00'	17°25'13"	16.55'	32.71'	N32°08'09"W

HATCH LEGEND

FORMAL OPEN SPACE



NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

Kimley»Horn
214 Oceanside Drive
Nashville, TN 37204
Main: 615.564.2701
www.kimley-horn.com
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GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

SCOTT HAMILTON PROTON THERAPY CENTER

FRANKLIN, TENNESSEE

BRYAN McMASTER
REGISTERED
LANDSCAPE
ARCHITECT
108182
STATE OF TENNESSEE
4/5/16

No.	REVISIONS	DATE	BY
1	PER CITY COMMENTS	04/07/2016	

DESIGNED BY:	CJM
DRAWN BY:	CJM
CHECKED BY:	RLM
DATE:	03/14/2016
KHA PROJECT NO.	118133000

OVERALL SITE PLAN

SHEET NUMBER
C2.0

COF# 6076

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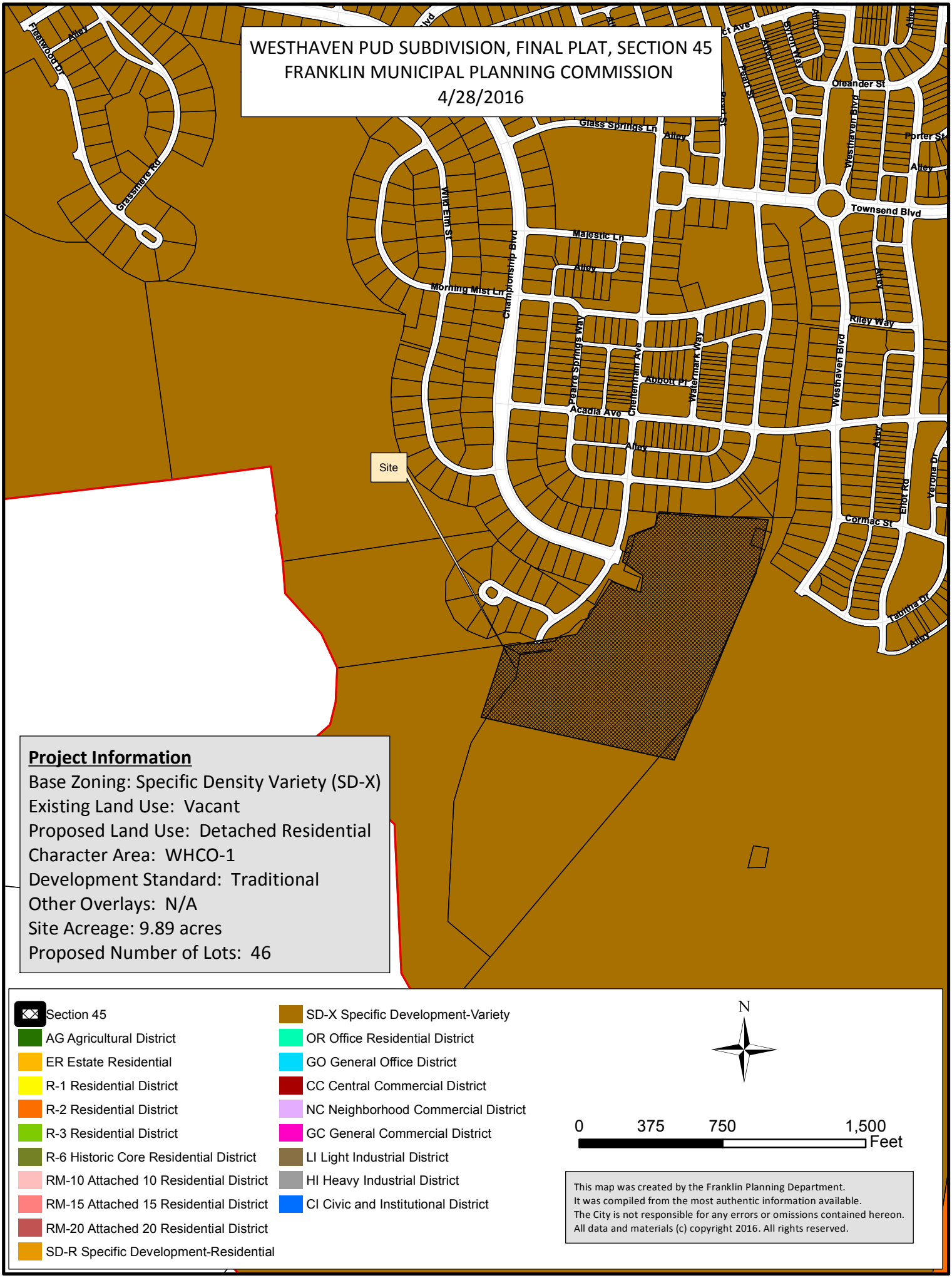
Drawing name: K:\NSH_LDEV\118133000 - Carothers MOB\4-CADD\3-PlanSheets\C2.0 Site Layout - 118133000.dwg C2.0 Overall Site Layout Apr 07, 2016 10:19am by: yates.bateman


WESTHAVEN PUD SUBDIVISION, FINAL PLAT, SECTION 45
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/2016
Site
Project Information
Base Zoning: Specific Density Variety (SD-X)
Existing Land Use: Vacant
Proposed Land Use: Detached Residential
Character Area: WHCO-1
Development Standard: Traditional
Other Overlays: N/A
Site Acreage: 9.89 acres
Proposed Number of Lots: 46
Section 45
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0 375 750 1,500
Feet
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It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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COF no: 6077

CONDITIONS OF APPROVAL:

Performance Agreement and Surety

General Comments

1. Engineering Sureties

-

Any unposted sureties associated with this development from site plan(s) 6044 shall be transferred to this final plat as a condition of approval. No action is necessary from applicant.

(Previous comment restated for informational purposes only, no response necessary.)

Planning

General Comments

2. One-Stop Procedure

- Due to the applicant's diligence in addressing staff comments and resolving most issues prior to resubmittal, this project is eligible for the One-Stop Post-PC review process. To participate in the One-Stop Post-PC process, the applicant must submit complete and corrected plans electronically through the IDT online review system by the scheduled One-Stop review date and be present at the One-Stop Center on the scheduled date and time that the One-Stop Post-PC service is available. The intent of One-Stop review is to close all outstanding conditions of approval and gain final document approval in an abbreviated time frame. Plans are reviewed on a first-come, first-serve basis in the One-Stop Center.

- For eligible final plats, the applicant shall bring a mylar with all non-City Hall signatures provided. The applicant will also be required to establish required sureties prior to City Department signatures being applied. The sureties may be established after the one stop process.
- In the case of site plans, the one stop process can only satisfy the City of Franklin review process. The review by State Authority and pre-construction meetings with staff in the field will still be required prior to the issue of stormwater and grading and/or utility construction permits.

If all conditions of approval have not been met at the scheduled One-Stop review, the applicant will be required to submit the project for additional review at another scheduled One-Stop date. The next available One-Stop Post-PC date is **5/4/2016** and the applicant must check in at the One Stop center **between the hours of 8:00 and 11:00 a.m.** in order for their plans to be reviewed that day. The applicant may contact the Department of Building and Neighborhood Services with any questions regarding the process and for any future One-Stop Post-PC dates.

Owner/Subdivider: Westhaven Partners, LLC

Owners/Partners with 5% interest or more:

Westhaven Partners,LLC c/o Tim Downey - tim.downey@southernland.com 1550 W. McEwen Drive, Suite 200 Franklin, TN 37067 (615) 778-3150	
H. Rhodes Hart 612 10th Ave, North Nashville, TN 37203 (615) 259-4222	Frank Mastrapasqua 814 Church Street, #300 Nashville, TN 37203 (615) 244-8400
PPMC Limited Partnership c/o Pete Serodino P.O. Box 4539 Chattanooga, TN 37405 (423) 266-1855	Springlake, G.P. c/o Ron Pace 95 White Bridge Road, #504 Nashville, TN 37205 (615) 352-9600
Monica Smiley 1417 Heritage Landing Drive Chattanooga, TN 37405 (423) 266-1070	Frank J.B. Varallo Rone-Regency Jewelers Brainerd Village Chattanooga, TN 37411 (423) 894-1188

Plat Notes:

1. The purpose of this plat is to create 46 lots (Lots 1790-1835).
2. Subject property is shown as Section 45 located in Westhaven P.U.D. Subdivision, Fifth Civil District, City of Franklin, Williamson County, Tennessee.
3. Subject property is identified as a portion of Parcel 23 on Property Map 64.
4. Zoning: Mixed-Use Local District (ML 1.8/Traditional/WHCO-1)
5. All lots in Section 45 fall in the T4 and T5 Transect Zone as defined in the Westhaven Concept Plan (Revision 2) and Pattern Book, revised 05/08/07.
6. According to the Westhaven Pattern Book, the following building types would be permitted in the T4 and T5 transect zones - sideyard house, cottage, courtyard house, townhouse, flex house, or house.

   Section 45 includes the following building types and sizes: sideyard houses, cottages, courtyard houses, townhomes, courtyard apartments, and flex houses.

   Dwelling unit living areas: Exclusive of open porches, garages, and ancillary apartments:
   Minimum.....1,000 S.F.
   Maximum.....10,000 S.F.
   Maximum building heights....2 stories
7. Minimum setback requirements (Section 45 lots):
   Front yard - 10'
   Side yard - 5' (min. 10' between buildings)
   (minimum 0' between townhome units)
   Note: Projections shall not extend to a point closer than 4 feet from the property line. Any projections (including soffits) into the 5' sideyard setback shall have a one-hour fire-resistive construction on the underside. Refer to the 2004 IRC Supplement R302.1 Exterior Walls for further explanation.

   Rear yard/Alley setback - 7' (minimum 18' wide x 22' deep parking apron is required from the front of the apron to the face of alley curb) except on street corner lots and lots that provide garages with a storage area of 50 square feet or greater.

   Rear yard/Non-Alley setback - 5' minimum to the property line; 10' minimum between buildings (for the main, back and ancillary buildings).
8. Bearings are based on TN Grid System (NAD 83)
9. Subject property is not within a Flood Hazard Area as per F.E.M.A. Flood Insurance Rate Map No. 47187C0190F, Revision Date September 29, 2006, Community No. 470206, Panel No. 195.
10. The developer acknowledges that all lots have adequate building envelopes and no variances will be required.
11. All streets and alleys are designated as Public Right-of-Way; the City of Franklin is not responsible for the replacement or repair of any private structures within public easements should the structures be disturbed in the process of the City exercising its easement rights.
12. Streets, drainage easements, structures and culverts shall be maintained by the City of Franklin. Detention ponds and outlet structures within public drainage easements are to be maintained by the owner.
13. Stormwater quality shall be addressed with each site plan.
14. Open space areas, roadway medians, brick pedestrian crosswalks, bike paths, sidewalks outside of right-of-ways, trails and detention facilities shall be maintained by the Westhaven Home Owners Association and shall be Public Utility, Drainage and Access Easements.
15. Building Elements: Porches, stoops, chimneys, bay windows, and balconies may encroach into the front yard setbacks. Chimneys may encroach up to 1'-0" from the property line within the sideyard setbacks. Where chimneys encroach into the sideyard setback, the minimum separation between dwellings shall be reduced by the distance of the encroachment only at the width of the fireplace. The remainder of the sideyard setback shall be the stated minimum. Chimneys that encroach closer than 5'-0" to a property line must meet the fire rating requirements of the City of Franklin Building Codes.
16. Within new developments and for off-site lines constructed as a result of, or to provide service to, the new development, all utilities, (including cable television, electrical, natural gas, sewer, telephone and water lines) shall be placed underground.
17. All street light locations and quantities are approximate. Final positioning and quantity shall be at the direction of MTEMC. 17. Mineral rights are to be held by Westhaven Partners, LLC.
18. Property numbers are indicated as such: Lot numbers are encircled and address numbers are enclosed by rectangular shape.
19. At all temporary turnarounds, a sign shall be placed stating, "Street to be extended by authority of the City of Franklin."
20. Street address numbers are assigned to the following street names: Lots 1790-1807 Championship Blvd., Lots 604-622 Jasper Ave., Lots 1000-1005 Clifton Street, Lots 1702-1720 Grassmere Road.
21. Maintenance of all stormwater management features shall be the responsibility of the property owner(s) or HOA.
22. No obstructions or encroachments which impede the flow of stormwater shall be permitted within Public Drainage Easements between lots. The City of Franklin is not responsible for repair or replacement of any encroachments that are damaged or removed in the course of maintenance activity within easements.

150' 0' 150' 300' 450'
GRAPHIC SCALE

Legend		Legend (cont.)	
Existing Iron Rod	○	Water Valve	⋈
Iron Rod Set	●	Fire Hydrant	⋇
Existing Concrete Monument	□	Street Light	✳
Concrete Monument Set	■	Sidewalk Pattern	
Storm Catchbasin	◙	Public Utility & Drainage Esmt.	P.U.D.E.
Sewer Manhole	⊙	Public Drainage Esmt.	P.D.E.
Street Address	1234	Public Utility & Access Esmt.	P.U.A.E.

Certificate of Survey

I (we) hereby certify that the subdivision plat as shown hereon is correct and that all of the monuments shown hereon have been placed as indicated. This subdivision plat correctly represents a survey made under my supervision on the 2nd day of February, 2016.

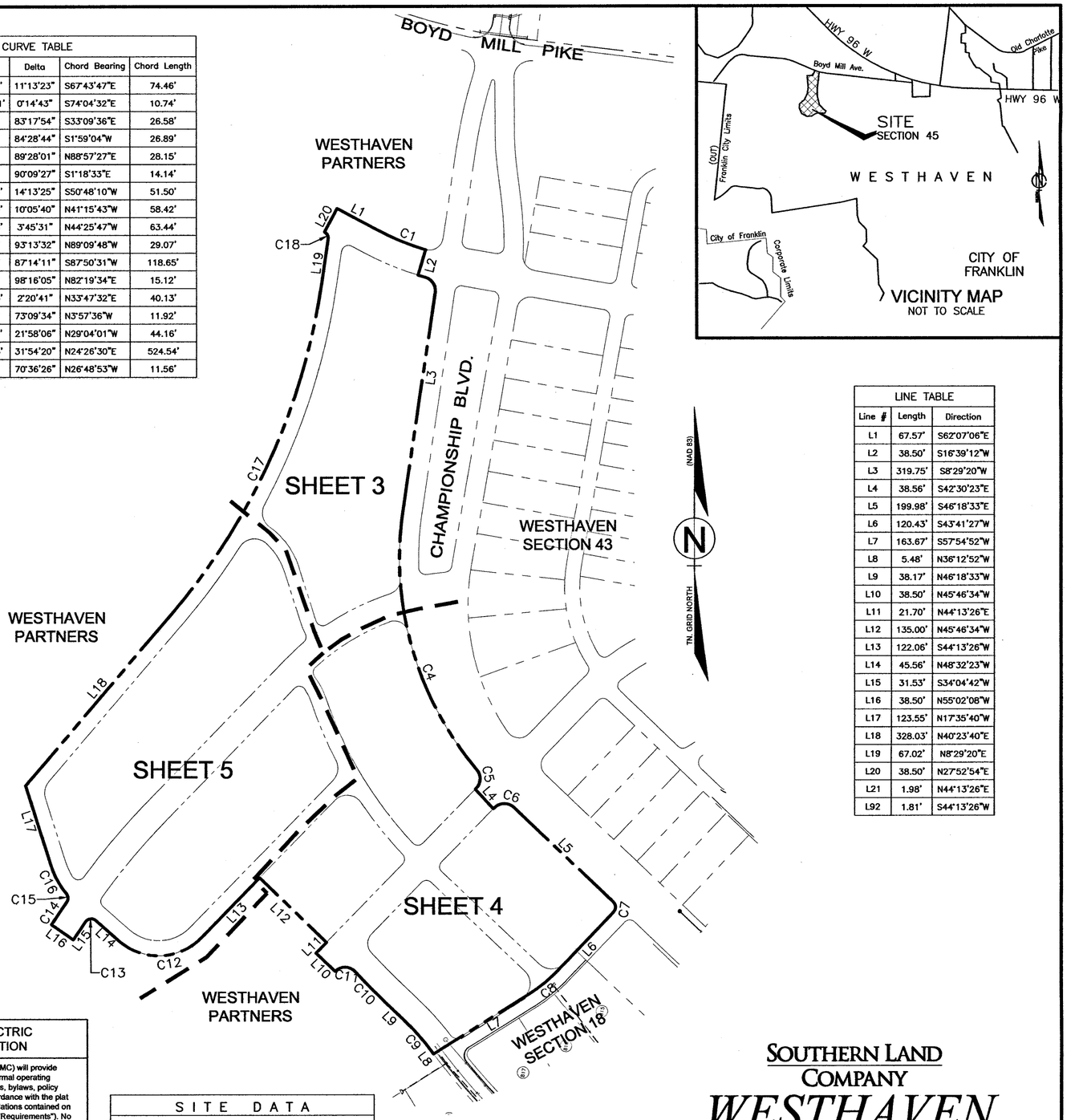
4/1/16

Joey C. Wilson, II, PE, RLS Tennessee RLS No. 2089
Wilson & Associates, P.C.
Engineering/Surveying/Environmental
108 Beasley Drive, Franklin, TN 37064
Office: 615.794.2275 FAX 615.794.2176
jwilson@wilsonpc.com

JOEY C. WILSON II REGISTERED LAND SURVEYOR AGRICULTURE COMMERCE 4/1/16 TENNESSEE NO. 2089

CURVE TABLE					
Curve #	Length	Radius	Delta	Chord Bearing	Chord Length
C1	74.58'	380.75'	11°13'23"	S67°43'47"E	74.46'
C2	10.74'	2509.21'	0°14'43"	S74°04'32"E	10.74'
C3	29.08'	20.00'	83°17'54"	S33°09'36"E	26.58'
C5	29.49'	20.00'	84°28'44"	S1°59'04"W	26.89'
C6	31.23'	20.00'	89°28'01"	N88°57'27"E	28.15'
C7	15.71'	9.99'	90°09'27"	S1°18'33"E	14.14'
C8	51.64'	208.00'	14°13'25"	S50°48'10"W	51.50'
C9	58.49'	332.00'	10°05'40"	N41°15'43"W	58.42'
C10	63.45'	967.25'	3°45'31"	N44°25'47"W	63.44'
C11	32.54'	20.00'	93°13'32"	N89°09'48"W	29.07'
C12	130.94'	86.00'	87°14'11"	S87°50'31"W	118.65'
C13	17.15'	10.00'	98°16'05"	N82°19'34"E	15.12'
C14	40.13'	980.75'	2°20'41"	N33°47'32"E	40.13'
C15	12.77'	10.00'	73°09'34"	N3°57'36"W	11.92'
C16	44.43'	115.87'	21°58'06"	N29°04'01"W	44.16'
C17	531.38'	954.25'	31°54'20"	N24°26'30"E	524.54'
C18	12.32'	10.00'	70°36'26"	N26°48'53"W	11.56'

DETACHED RESIDENTIAL LOT TREE CHART							
Lot #	Lot Size	ACI	# Trees	Lot #	Lot Size	ACI	# Trees
1790	11,082 sf	12	4	1813	6210 sf	6	2
1791	8123 sf	6	2	1814	5535 sf	6	2
1792	6880 sf	6	2	1815	5535 sf	6	2
1793	7176 sf	6	2	1816	9113 sf	6	2
1794	7575 sf	6	2	1817	6156 sf	6	2
1795	8082 sf	6	2	1818	4979 sf	6	2
1796	8700 sf	6	2	1819	4979 sf	6	2
1797	10,099 sf	12	4	1820	4979 sf	6	2
1798	12,848 sf	12	4	1821	4979 sf	6	2
1799	9335 sf	6	2	1822	4979 sf	6	2
1800	6850 sf	6	2	1823	4979 sf	6	2
1801	7194 sf	6	2	1824	7247 sf	6	2
1802	7191 sf	6	2	1825	7819 sf	6	2
1803	10,473 sf	12	4	1826	7335 sf	6	2
1804	10,022 sf	12	4	1827	5621 sf	6	2
1805	6432 sf	6	2	1828	5444 sf	6	2
1806	6432 sf	6	2	1829	5327 sf	6	2
1807	9073 sf	6	2	1830	5229 sf	6	2
1808	8814 sf	6	2	1831	6362 sf	6	2
1809	6276 sf	6	2	1832	6212 sf	6	2
1810	6265 sf	6	2	1833	6098 sf	6	2
1811	7434 sf	6	2	1834	6083 sf	6	2
1812	6170 sf	6	2	1835	6760 sf	6	2



LINE TABLE		
Line #	Length	Direction
L1	67.57'	S62°07'06"E
L2	38.50'	S16°39'12"W
L3	319.75'	S8°29'20"W
L4	38.56'	S42°30'23"E
L5	199.98'	S46°18'33"E
L6	120.43'	S43°41'27"W
L7	163.67'	S57°54'52"W
L8	5.48'	N36°12'52"W
L9	38.17'	N46°18'33"W
L10	38.50'	N45°46'34"W
L11	21.70'	N44°13'26"E
L12	135.00'	N45°46'34"W
L13	122.06'	S44°13'26"W
L14	45.56'	N48°32'23"W
L15	31.53'	S34°04'42"W
L16	38.50'	N55°02'08"W
L17	123.55'	N17°35'40"W
L18	328.03'	N40°23'40"E
L19	67.02'	N8°29'20"E
L20	38.50'	N27°52'54"E
L21	1.98'	N44°13'26"E
L92	1.81'	S44°13'26"W

CERTIFICATE OF APPROVAL OF SUBDIVISION NAME, STREET NAMES, AND ADDRESSING

Subdivision name and street names approved by the Williamson County Emergency Management Agency.

Williamson County Emergency Management Agency — Date

City of Franklin — Date

CERTIFICATE OF APPROVAL OF WATER SYSTEMS

I hereby certify that:

(1) the water system designated in Westhaven PUD Subdivision, Section 45 has been installed in accordance with City Specifications, or

(2) a performance agreement and surety in the amount of $_____ for the water system has been posted with HB&TS Utility District to assure completion of such system.

HB&TS Utility District — Date

MIDDLE TENNESSEE ELECTRIC MEMBERSHIP CORPORATION

Middle Tennessee Electric Membership Corporation (MTEMC) will provide electric service to the subject property according to the normal operating practices of MTEMC as defined in the rules and regulations, bylaws, policy bulletins and operational bulletins of MTEMC, and in accordance with the plat approval checklist, tree planting guidelines and other regulations contained on the MTEMC website at www.mtemc.com (collectively the "Requirements"). No electric service will be provided until MTEMC's Requirements have been met and approved in writing by an authorized representative of MTEMC. Any approval is, at all times, contingent upon continuing compliance with MTEMC's Requirements.

Date — Middle Tennessee Electric Membership Corporation

SITE DATA	
TOTAL AREA =	± 9.89 Ac. (430,665.93 sf)
TOTAL ROW =	± 2.39 Ac. (104,187.57 sf)
TOTAL LOT AREA =	± 7.49 Ac. (326,479.05 sf)

SOUTHERN LAND COMPANY

WESTHAVEN

P.U.D. SUBDIVISION

SECTION 45

CERTIFICATE OF OWNERSHIP

I (we) hereby certify that I am (we are) the owner(s) of the property shown hereon as of record in Book _____, Page_____, R.O.W.C., Tennessee, and adopt the plan of subdivision of the property as shown hereon and dedicate all public ways and easements as noted. No lot(s) as shown hereon shall again be subdivided, resubdivided, altered, or changed so as to produce less area than is hereby established until otherwise approved by the Franklin Municipal Planning Commission, and under no condition shall such lot(s) be made to produce less area than is prescribed by the restrictive covenants as of record in Book_____, Page_____, R.O.W.C., Tennessee, running with the title to the property. I (we) further certify that there are no liens on this property, except as follows: Book_____, Page_____, R.O.W.C.

Owner — Date

CERTIFICATE OF APPROVAL OF STREETS AND DRAINAGE AND SIDEWALKS

I hereby certify that :

(1) the streets, drainage, and sidewalks designated in Westhaven PUD Subdivision, Section 45 have been installed in accordance with City specifications, or

(2) a performance agreement and surety in the amount of $_____ for streets, $_____for drainage, and $_____for sidewalks has been posted with the City of Franklin, Tennessee, to assure completion of such improvements.

Director, Streets Department, City of Franklin, Tennessee — Date

CERTIFICATE OF APPROVAL OF SEWER SYSTEMS

I hereby certify that:

(1) the sewer system designated in Westhaven PUD Subdivision, Section 45 has been installed in accordance with City specifications, or

(2) a performance agreement and surety in the amount of $_____ for the sewer system has been posted with the City of Franklin, Tennessee to assure completion of such system.

Director Water Management Department, City of Franklin, Tennessee — Date

CERTIFICATE OF APPROVAL OF RECORDING

Approved by the Franklin Municipal Planning Commission, Franklin, Williamson County, Tennessee, with the exception of such conditions, if any, as are noted in the Planning Commission minutes for the _____day of _____, 20___, and this plat has been approved for recording in the Register's Office of Williamson County, Tennessee.

Secretary, Franklin Municipal Planning Commission — Date

FINAL SUBDIVISION PLAT

FRANKLIN - WILLIAMSON COUNTY - TENNESSEE

TOTAL ACRES 9.89 — TOTAL # OF LOTS 46
ACRES NEW RD/ST 2.40 (ROW) — L.F. OF NEW RD/ST 1203.01
ACRES OPEN SPACE 0.0 — CIVIL DISTRICT 5th
DRAWN BY JAG — CLOSURE ERROR < 1:10,000
SCALE = 1"=125' — DATE = 03/14/16

COF PROJECT # 6077 — *SHEET 1 OF 5*

LINE TABLE		
Line #	Length	Direction
L1	67.57'	S62°07'06"E
L2	38.50'	S16°39'12"W
L3	319.75'	S8°29'20"W
L4	38.56'	S42°30'23"E
L5	199.98'	S46°18'33"E
L6	120.43'	S43°41'27"W
L7	163.67'	S57°54'52"W
L8	5.48'	N36°12'52"W
L9	38.17'	N46°18'33"W
L10	38.50'	N45°46'34"W
L11	21.70'	N44°13'26"E
L12	135.00'	N45°46'34"W
L13	122.06'	S44°13'26"W
L14	45.56'	N48°32'23"W
L15	31.53'	S34°04'42"W
L16	38.50'	N55°02'08"W
L17	123.55'	N17°35'40"W
L18	328.03'	N40°23'40"E
L19	67.02'	N8°29'20"E
L20	38.50'	N27°52'54"E
L21	1.98'	N44°13'26"E
L22	23.04'	S62°07'06"E
L23	46.36'	S8°29'20"W
L24	56.00'	S8°29'20"W

LINE TABLE		
Line #	Length	Direction
L25	46.00'	S8°29'20"W
L26	46.00'	S8°29'20"W
L27	46.00'	S8°29'20"W
L28	46.00'	S8°29'20"W
L29	33.42'	S8°29'20"W
L30	78.98'	N17°35'40"W
L31	52.24'	N8°29'20"E
L32	143.56'	N81°30'40"W
L33	147.08'	N81°30'40"W
L34	159.95'	N81°30'40"W
L35	169.79'	N81°30'40"W
L36	181.98'	N81°30'40"W
L37	196.80'	S81°30'40"E
L38	164.87'	S86°24'19"E
L39	152.40'	N81°30'40"W
L40	78.98'	S17°35'40"E
L41	14.45'	S44°13'26"W
L42	46.51'	S44°13'26"W
L43	37.44'	S44°13'26"W
L44	37.44'	S44°13'26"W
L45	37.44'	S44°13'26"W
L46	37.44'	S44°13'26"W
L47	46.51'	S44°13'26"W
L48	32.69'	S44°13'26"W

LINE TABLE		
Line #	Length	Direction
L49	97.50'	N17°35'40"W
L50	40.39'	N40°23'40"E
L51	48.35'	N40°23'40"E
L52	48.35'	N40°23'40"E
L53	48.35'	N40°23'40"E
L54	48.35'	N40°23'40"E
L55	38.92'	N40°23'40"E
L56	29.27'	N40°23'40"E
L57	184.23'	N17°35'40"W
L58	173.70'	N17°35'40"W
L59	167.31'	N17°35'40"W
L60	162.95'	N17°35'40"W
L61	159.94'	N17°35'40"W
L62	156.99'	N17°35'40"W
L63	153.33'	N17°35'40"W
L64	149.77'	N17°35'40"W
L65	148.10'	S17°35'40"E
L66	149.10'	S17°35'40"E
L67	47.28'	S44°13'26"W
L68	37.43'	S44°13'26"W
L69	37.43'	S44°13'26"W
L70	37.43'	S44°13'26"W
L71	37.43'	S44°13'26"W
L72	37.43'	S44°13'26"W

LINE TABLE		
Line #	Length	Direction
L73	37.44'	S44°13'26"W
L74	25.86'	S44°13'26"W
L75	50.77'	N48°32'23"W
L76	8.49'	N44°13'26"E
L77	37.44'	N44°13'26"E
L78	37.43'	N44°13'26"E
L79	37.43'	N44°13'26"E
L80	37.43'	N44°13'26"E
L81	37.43'	N44°13'26"E
L82	37.44'	N44°13'26"E
L83	32.43'	N44°13'26"E
L84	150.89'	N17°35'40"W
L85	150.89'	S17°35'45"E
L86	150.89'	S17°35'45"E
L87	150.89'	S17°35'45"E
L88	150.89'	S17°35'45"E
L89	150.89'	S17°35'45"E
L90	150.89'	S17°35'45"E
L91	146.72'	S17°35'45"E
L92	1.81'	S44°13'26"W
L93	109.71'	N44°13'26"E
L94	140.99'	S68°53'51"W
L95	141.23'	S65°57'59"W
L96	141.32'	S60°17'44"W

LINE TABLE		
Line #	Length	Direction
L97	141.12'	S54°37'30"W
L98	51.97'	S46°18'33"E
L99	46.00'	S46°18'33"E
L100	46.00'	S46°18'33"E
L101	56.00'	S46°18'33"E
L102	104.82'	S43°41'27"W
L103	41.00'	N46°18'33"W
L104	46.00'	N46°18'33"W
L105	46.00'	N46°18'33"W
L106	63.00'	N46°18'33"W
L107	107.93'	N44°13'26"E
L108	46.10'	S46°18'33"E
L109	46.00'	S46°18'33"E
L110	46.00'	S46°18'33"E
L111	49.78'	S46°18'33"E
L112	106.49'	S57°54'52"W
L113	139.82'	S43°41'27"W
L114	139.82'	S43°41'27"W
L115	139.82'	S43°41'27"W
L116	137.17'	N44°13'26"E
L117	136.27'	N44°13'26"E
L118	135.85'	S44°13'26"W
L119	20.38'	N46°18'33"W
L120	17.79'	N46°18'33"W

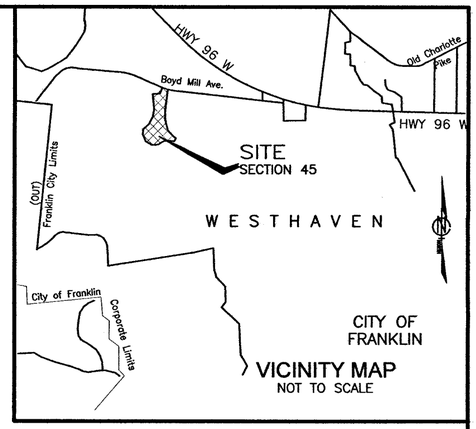
LINE TABLE		
Line #	Length	Direction
L121	103.93'	N44°13'26"E
L122	30.74'	S44°13'26"W
L123	46.00'	S44°13'26"W
L124	41.00'	S44°13'26"W
L125	41.00'	S44°13'26"W
L126	135.00'	S45°46'34"E
L127	135.00'	S45°46'34"E
L128	135.00'	S45°46'34"E
L129	41.00'	N44°13'26"E
L130	41.00'	N44°13'26"E
L131	46.00'	N44°13'26"E
L132	28.26'	N44°13'26"E

CURVE TABLE					
Curve #	Length	Radius	Delta	Chord Bearing	Chord Length
C1	74.58'	380.75'	11°13'23"	S67°43'47"E	74.46'
C2	10.74'	2509.21'	0°14'43"	S74°04'32"E	10.74'
C3	29.08'	20.00'	83°17'54"	S33°09'36"E	26.58'
C4	404.10'	475.13'	48°43'48"	S15°52'59"E	392.03'
C5	29.49'	20.00'	84°28'44"	S1°59'04"W	26.89'
C6	31.23'	20.00'	89°28'01"	N88°57'27"E	28.15'
C7	15.71'	9.99'	90°09'27"	S1°18'33"E	14.14'
C8	51.64'	208.00'	14°13'25"	S50°48'10"W	51.50'
C9	58.49'	332.00'	10°05'40"	N41°15'43"W	58.42'
C10	63.45'	967.25'	3°45'31"	N44°25'47"W	63.44'
C11	32.54'	20.00'	93°13'32"	N89°09'48"W	29.07'
C12	130.94'	86.00'	87°14'11"	S87°50'31"W	118.65'
C13	17.15'	10.00'	98°16'05"	N82°19'34"E	15.12'
C14	40.13'	980.75'	2°20'41"	N33°47'32"E	40.13'
C15	12.77'	10.00'	73°09'34"	N3°57'36"W	11.92'
C16	44.43'	115.87'	21°58'06"	N29°04'01"W	44.16'
C17	531.38'	954.25'	31°54'20"	N24°26'30"E	524.54'
C18	12.32'	10.00'	70°36'26"	N26°48'53"W	11.56'
C19	82.13'	419.25'	11°13'25"	S67°43'48"E	81.99'
C20	12.61'	479.62'	1°30'24"	S7°43'26"W	12.61'
C21	44.67'	475.12'	5°23'13"	S4°16'18"W	44.66'
C22	44.05'	475.12'	5°18'41"	S1°04'39"E	44.03'
C23	26.41'	20.00'	75°39'12"	N34°05'48"E	24.53'
C24	103.48'	369.25'	16°03'23"	S63°53'43"W	103.14'
C25	17.95'	10.00'	102°51'20"	S72°42'19"E	15.64'

CURVE TABLE					
Curve #	Length	Radius	Delta	Chord Bearing	Chord Length
C26	5.72'	89.00'	3°40'59"	N19°26'09"W	5.72'
C27	39.46'	111.00'	20°22'00"	N27°46'40"W	39.25'
C28	32.73'	111.00'	16°53'40"	N46°24'30"W	32.61'
C29	36.21'	25.00'	82°59'26"	S13°21'37"E	33.13'
C30	9.65'	976.25'	0°33'58"	N27°51'08"E	9.65'
C31	48.28'	976.25'	2°50'01"	N26°09'08"E	48.28'
C32	47.60'	976.25'	2°47'36"	N23°20'19"E	47.59'
C33	47.05'	976.25'	2°45'40"	N20°33'41"E	47.04'
C34	46.62'	976.25'	2°44'10"	N17°48'46"E	46.62'
C35	46.31'	976.25'	2°43'05"	N15°05'09"E	46.31'
C36	56.12'	976.25'	3°17'37"	N12°04'48"E	56.11'
C37	33.13'	976.25'	1°56'39"	N9°27'40"E	33.12'
C38	19.09'	10.00'	109°23'34"	N63°11'07"E	16.32'
C39	38.51'	25.00'	88°15'35"	S86°36'36"W	34.81'
C40	49.19'	89.00'	31°39'57"	N33°25'38"W	48.56'
C41	18.13'	111.00'	9°21'24"	S22°16'21"E	18.11'
C42	13.32'	10.00'	76°18'10"	S11°12'02"W	12.35'
C43	33.05'	369.25'	5°07'41"	S46°47'17"W	33.04'
C44	13.87'	1019.25'	0°46'48"	S43°50'02"W	13.87'
C45	47.49'	1019.25'	2°40'10"	S42°06'33"W	47.49'
C46	48.89'	1019.25'	2°44'55"	S39°24'00"W	48.89'
C47	33.61'	1019.25'	1°53'21"	S37°04'53"W	33.60'
C48	19.43'	10.00'	111°20'20"	S88°11'38"E	16.52'
C49	23.19'	89.00'	14°55'48"	S25°03'34"E	23.13'
C50	25.30'	25.00'	57°59'20"	S11°24'00"W	24.24'

CURVE TABLE					
Curve #	Length	Radius	Delta	Chord Bearing	Chord Length
C51	9.68'	976.25'	0°34'06"	N40°06'37"E	9.68'
C52	39.69'	976.25'	2°19'46"	N38°39'42"E	39.69'
C53	40.85'	976.25'	2°23'51"	N36°17'54"E	40.85'
C54	47.89'	976.25'	2°48'38"	N33°41'39"E	47.88'
C55	4.45'	25.00'	10°11'27"	N37°23'04"E	4.44'
C56	18.02'	10.00'	103°15'48"	S84°08'40"E	15.68'
C57	21.41'	89.00'	13°46'59"	S25°37'16"E	21.36'
C58	90.73'	607.00'	8°33'50"	S23°00'41"E	90.64'
C59	31.21'	25.00'	71°31'02"	S8°27'55"W	29.22'
C60	19.39'	64.00'	17°21'36"	S52°54'14"W	19.32'
C61	78.05'	64.00'	69°52'35"	N83°28'41"W	73.30'
C62	14.69'	10.00'	84°10'22"	N6°27'12"W	13.41'
C63	108.61'	980.75'	6°20'43"	N38°48'20"E	108.56'
C64	38.44'	980.75'	2°14'44"	N43°06'04"E	38.44'
C65	34.06'	20.00'	97°34'18"	S61°46'44"E	30.09'
C66	49.07'	475.12'	5°55'02"	S15°57'08"E	49.05'
C67	44.93'	475.12'	5°25'07"	S21°37'13"E	44.92'
C68	43.91'	475.12'	5°17'44"	S26°58'39"E	43.90'
C69	43.92'	475.12'	5°17'46"	S32°16'24"E	43.90'
C70	44.17'	475.12'	5°19'36"	S37°35'05"E	44.16'
C71	16.20'	10.00'	92°49'36"	S89°21'46"E	14.49'
C72	77.34'	585.00'	7°34'28"	N39°09'44"W	77.28'
C73	57.90'	585.00'	5°40'14"	N32°32'23"W	57.87'
C74	57.90'	585.00'	5°40'15"	N26°52'08"W	57.88'
C75	52.16'	585.00'	5°06'30"	S21°28'46"E	52.14'

CURVE TABLE					
Curve #	Length	Radius	Delta	Chord Bearing	Chord Length
C76	2.00'	585.00'	0°11'44"	S18°49'39"E	2.00'
C77	35.22'	111.00'	18°10'55"	N27°49'14"W	35.08'
C78	14.73'	10.00'	84°24'06"	S5°17'21"W	13.43'
C79	126.68'	330.75'	21°56'43"	N58°27'46"E	125.91'
C80	39.27'	25.00'	90°00'00"	N88°41'27"E	35.36'
C81	15.80'	10.00'	90°31'59"	N1°02'33"W	14.21'
C82	15.61'	10.00'	89°28'01"	N88°57'27"E	14.08'
C83	45.48'	25.00'	104°13'25"	S5°48'10"W	39.46'
C84	14.96'	10.00'	85°41'09"	N79°14'33"W	13.60'
C85	38.01'	368.00'	5°55'04"	N39°21'31"W	37.99'
C86	25.64'	368.00'	3°59'30"	N44°18'48"W	25.63'
C87	28.21'	931.25'	1°44'09"	N45°26'28"W	28.21'
C88	37.25'	931.25'	2°17'31"	N43°25'38"W	37.25'
C89	30.20'	20.00'	86°30'18"	N0°58'17"E	27.41'
C90	44.38'	25.00'	101°43'05"	S84°55'02"E	38.78'
C91	96.24'	607.00'	9°05'02"	S38°36'00"E	96.14'
C92	15.25'	10.00'	87°21'57"	S0°32'27"W	13.81'



VICINITY MAP
NOT TO SCALE

PARCEL AREA TABLE		
Parcel #	Area (SF)	Area (Ac.)
1790	11081.90	0.25
1791	8122.94	0.19
1792	6879.55	0.16
1793	7175.46	0.16
1794	7575.23	0.17
1795	8081.75	0.19
1796	8699.50	0.20
1797	10099.30	0.23
1798	12847.60	0.29
1799	9335.61	0.21
1800	6849.50	0.16
1801	7193.60	0.17
1802	7190.76	0.17
1803	10472.92	0.24
1804	10022.27	0.23
1805	6431.75	0.15
1806	6431.75	0.15
1807	9072.58	0.21
1808	8813.65	0.20
1809	6276.37	0.14

PARCEL AREA TABLE		
Parcel #	Area (SF)	Area (Ac.)
1810	6264.73	0.14
1811	7434.38	0.17
1812	6169.67	0.14
1813	6210.14	0.14
1814	5535.00	0.13
1815	5535.00	0.13
1816	9113.30	0.21
1817	6156.17	0.14
1818	4979.28	0.11
1819	4978.71	0.11
1820	4978.71	0.11
1821	4978.71	0.11
1822	4978.71	0.11
1823	4978.99	0.11
1824	7247.25	0.17
1825	7819.15	0.18
1826	7335.29	0.17
1827	5620.88	0.13
1828	5443.92	0.12
1829	5326.89	0.12

PARCEL AREA TABLE		
Parcel #	Area (SF)	Area (Ac.)
1830	5229.42	0.12
1831	6361.61	0.15
1832	6211.84	0.14
1833	6097.59	0.14
1834	6082.95	0.14
1835	6759.92	0.16

SOUTHERN LAND COMPANY
WESTHAVEN
P.U.D. SUBDIVISION
SECTION 45

Certificate of Survey

I (we) hereby certify that the subdivision plat as shown hereon is correct and that all of the monuments shown hereon have been placed as indicated. This subdivision plat correctly represents a survey made under my supervision on the 2nd day of February, 2016.

4/1/16

Joey C. Wilson, II, PE, RLS Tennessee RLS No. 2089
Wilson & Associates, P.C.
Engineering/Surveying/Environmental
108 Beasley Drive, Franklin, TN 37064
Office: 615.794.2275 FAX 615.794.2176
jwilson@wilsonpc.com

JOEY C. WILSON II REGISTERED LAND SURVEYOR AGRICULTURE COMMERCE TENNESSEE NO. 2089 4/1/16

GRAPHIC SCALE 50' 0' 50' 100' 150'

Legend		Legend (cont.)	
Existing Iron Rod	○	Water Valve	⋈
Iron Rod Set	●	Fire Hydrant	✖
Existing Concrete Monument	□	Street Light	✳
Concrete Monument Set	■	Sidewalk Pattern	
Storm Catchbasin	⧈	Public Utility & Drainage Esmt.	P.U.D.E.
Sewer Manhole	●	Public Drainage Esmt.	P.D.E.
Street Address	1234	Public Utility & Access Esmt.	P.U.A.E.

CERTIFICATE OF APPROVAL OF RECORDING

Approved by the Franklin Municipal Planning Commission, Franklin, Williamson County, Tennessee, with the exception of such conditions, if any, as are noted in the Planning Commission minutes for the ____ day of_____, 20___, and this plat has been approved for recording in the Register's Office of Williamson County, Tennessee.

Secretary — Date
Franklin Municipal Planning Commission

FINAL SUBDIVISION PLAT

FRANKLIN - WILLIAMSON COUNTY - TENNESSEE

TOTAL ACRES 9.89 — TOTAL # OF LOTS 46
ACRES NEW RD/ST 2.40 (ROW) — L.F. OF NEW RD/ST 1203.01
ACRES OPEN SPACE 0.0 — CIVIL DISTRICT 5th
DRAWN BY JAG — CLOSURE ERROR < 1:10,000
SCALE = 1"=50' — DATE = 03/14/16

COF PROJECT # 6077 — *SHEET 2 OF 5*

DETACHED RESIDENTIAL LOT TREE CHART							
Lot #	Lot Size	ACI	# Trees	Lot #	Lot Size	ACI	# Trees
1790	11,082 sf	12	4	1813	6210 sf	6	2
1791	8123 sf	6	2	1814	5535 sf	6	2
1792	6880 sf	6	2	1815	5535 sf	6	2
1793	7176 sf	6	2	1816	9113 sf	6	2
1794	7575 sf	6	2	1817	6156 sf	6	2
1795	8082 sf	6	2	1818	4979 sf	6	2
1796	8700 sf	6	2	1819	4979 sf	6	2
1797	10,099 sf	12	4	1820	4979 sf	6	2
1798	12,848 sf	12	4	1821	4979 sf	6	2
1799	9335 sf	6	2	1822	4979 sf	6	2
1800	6850 sf	6	2	1823	4979 sf	6	2
1801	7194 sf	6	2	1824	7247 sf	6	2
1802	7191 sf	6	2	1825	7819 sf	6	2
1803	10,473 sf	12	4	1826	7335 sf	6	2
1804	10,022 sf	12	4	1827	5621 sf	6	2
1805	6432 sf	6	2	1828	5444 sf	6	2
1806	6432 sf	6	2	1829	5327 sf	6	2
1807	9073 sf	6	2	1830	5229 sf	6	2
1808	8814 sf	6	2	1831	6362 sf	6	2
1809	6276 sf	6	2	1832	6212 sf	6	2
1810	6265 sf	6	2	1833	6098 sf	6	2
1811	7434 sf	6	2	1834	6083 sf	6	2
1812	6170 sf	6	2	1835	6760 sf	6	2

PARCEL AREA TABLE		
Parcel #	Area (SF)	Area (Ac.)
1790	11081.90	0.25
1791	8122.94	0.19
1792	6879.55	0.16
1793	7175.46	0.16
1794	7575.23	0.17
1795	8081.75	0.19
1796	8699.50	0.20
1797	10099.30	0.23
1798	12847.60	0.29
1799	9335.61	0.21
1800	6849.50	0.16
1801	7193.60	0.17
1802	7190.76	0.17
1803	10472.92	0.24
1804	10022.27	0.23
1805	6431.75	0.15
1806	6431.75	0.15
1807	9072.58	0.21
1808	8813.65	0.20
1809	6276.37	0.14

PARCEL AREA TABLE		
Parcel #	Area (SF)	Area (Ac.)
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1813	6210.14	0.14
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1817	6156.17	0.14
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1823	4978.99	0.11
1824	7247.25	0.17
1825	7819.15	0.18
1826	7335.29	0.17
1827	5620.88	0.13
1828	5443.92	0.12
1829	5326.89	0.12

PARCEL AREA TABLE		
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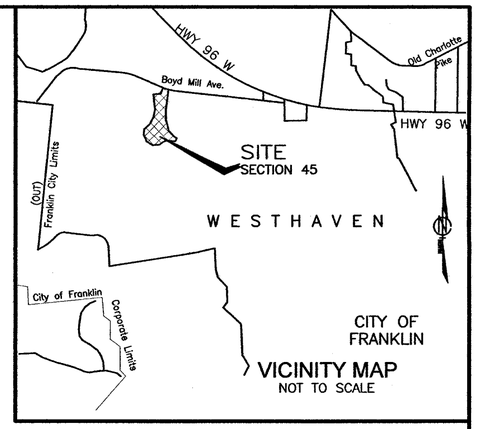

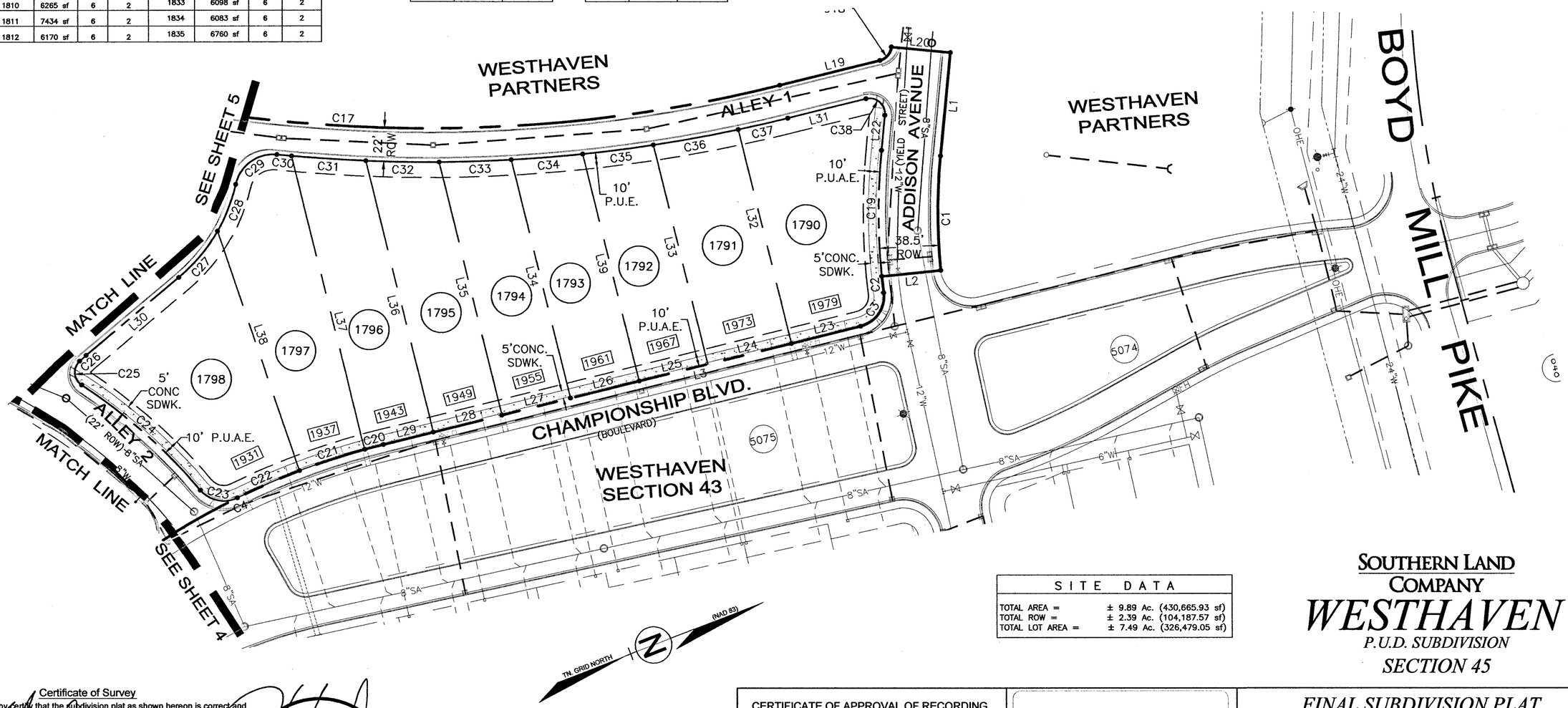

SITE DATA		
TOTAL AREA =	± 9.89 Ac.	(430,665.93 sf)
TOTAL ROW =	± 2.39 Ac.	(104,187.57 sf)
TOTAL LOT AREA =	± 7.49 Ac.	(326,479.05 sf)

SOUTHERN LAND COMPANY

WESTHAVEN

P.U.D. SUBDIVISION

SECTION 45

Certificate of Survey

I (we) hereby certify that the subdivision plat as shown hereon is correct and that all of the monuments shown hereon have been placed as indicated. This subdivision plat correctly represents a survey made under my supervision on the 2nd day of February, 2016.

Joey C. Wilson, II, PE, RLS Tennessee RLS No. 2089
Wilson & Associates, P.C.
Engineering/Surveying/Environmental
108 Beasley Drive, Franklin, TN 37064
Office: 615.794.2275 FAX 615.794.2176
jwilson@wilsonpc.com

JOEY C. WILSON II REGISTERED LAND SURVEYOR AGRICULTURE COMMERCE TENNESSEE NO. 2089 4/1/16

50' 0' 50' 100' 150'
GRAPHIC SCALE

Legend		Legend (cont.)	
Existing Iron Rod	○	Water Valve	⋈
Iron Rod Set	●	Fire Hydrant	⋇
Existing Concrete Monument	□	Street Light	✳
Concrete Monument Set	■	Sidewalk Pattern	
Storm Catchbasin	◘	Public Utility & Drainage Esmt.	P.U.D.E.
Sewer Manhole	⊙	Public Drainage Esmt.	P.D.E.
Street Address	1234	Public Utility & Access Esmt.	P.U.A.E.

CERTIFICATE OF APPROVAL OF RECORDING

Approved by the Franklin Municipal Planning Commission, Franklin, Williamson County, Tennessee, with the exception of such conditions, if any, as are noted in the Planning Commission minutes for the ____ day of _____, 20___, and this plat has been approved for recording in the Register's Office of Williamson County, Tennessee.

Secretary — Date
Franklin Municipal Planning Commission

FINAL SUBDIVISION PLAT

FRANKLIN - WILLIAMSON COUNTY - TENNESSEE

TOTAL ACRES 9.89	TOTAL # OF LOTS 46
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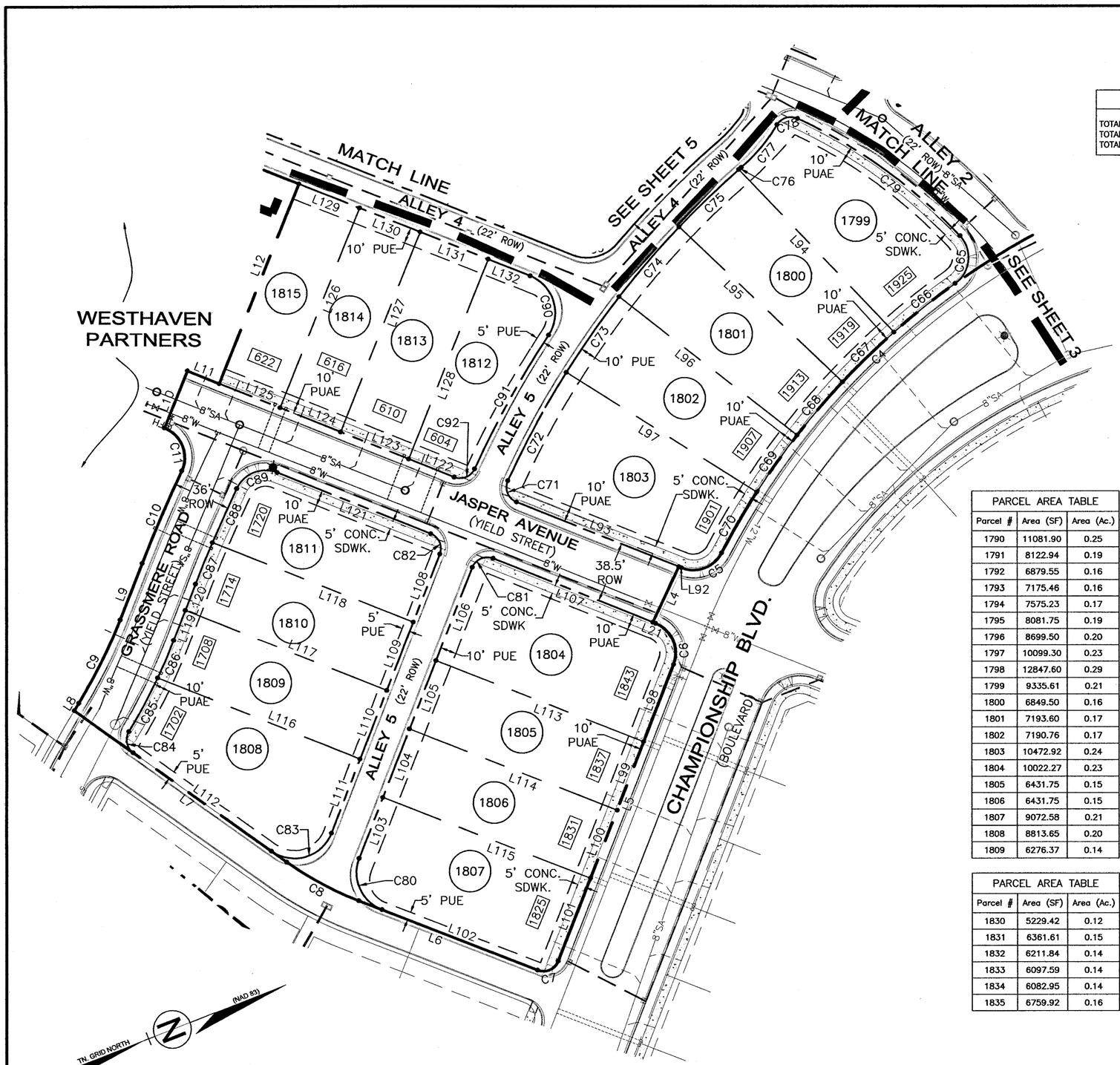
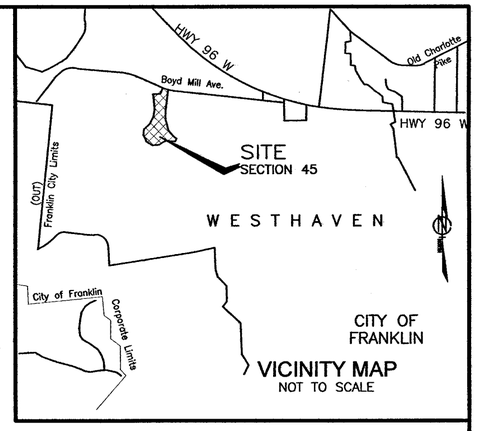
DRAWN BY JAG	CLOSURE ERROR < 1:10,000
SCALE = 1"=50'	DATE = 03/14/16

COF PROJECT # 6077 *SHEET 3 OF 5*





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1799	9335.61	0.21
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1804	10022.27	0.23
1805	6431.75	0.15
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1814	5535.00	0.13
1815	5535.00	0.13
1816	9113.30	0.21
1817	6156.17	0.14
1818	4979.28	0.11
1819	4978.71	0.11
1820	4978.71	0.11
1821	4978.71	0.11
1822	4978.71	0.11
1823	4978.99	0.11
1824	7247.25	0.17
1825	7819.15	0.18
1826	7335.29	0.17
1827	5620.88	0.13
1828	5443.92	0.12
1829	5326.89	0.12

PARCEL AREA TABLE		
Parcel #	Area (SF)	Area (Ac.)
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1797	10,099 sf	12	4	1820	4979 sf	6	2
1798	12,848 sf	12	4	1821	4979 sf	6	2
1799	9335 sf	6	2	1822	4979 sf	6	2
1800	6850 sf	6	2	1823	4979 sf	6	2
1801	7194 sf	6	2	1824	7247 sf	6	2
1802	7191 sf	6	2	1825	7819 sf	6	2
1803	10,473 sf	12	4	1826	7335 sf	6	2
1804	10,022 sf	12	4	1827	5621 sf	6	2
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1807	9073 sf	6	2	1830	5229 sf	6	2
1808	8814 sf	6	2	1831	6362 sf	6	2
1809	6276 sf	6	2	1832	6212 sf	6	2
1810	6265 sf	6	2	1833	6098 sf	6	2
1811	7434 sf	6	2	1834	6083 sf	6	2
1812	6170 sf	6	2	1835	6760 sf	6	2

SOUTHERN LAND COMPANY

WESTHAVEN

P.U.D. SUBDIVISION

SECTION 45

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JOEY C. WILSON II REGISTERED LAND SURVEYOR AGRICULTURE RURAL COMMERCE TENNESSEE NO. 2089 4/1/16

50' 0' 50' 100' 150'
GRAPHIC SCALE

Legend		Legend (cont.)	
Existing Iron Rod	○	Water Valve	⋈
Iron Rod Set	●	Fire Hydrant	✖
Existing Concrete Monument	□	Street Light	✳
Concrete Monument Set	■	Sidewalk Pattern	
Storm Catchbasin	⊠	Public Utility & Drainage Esmt.	P.U.D.E.
Sewer Manhole	⊙	Public Drainage Esmt.	P.D.E.
Street Address	1234	Public Utility & Access Esmt.	P.U.A.E.

CERTIFICATE OF APPROVAL OF RECORDING

Approved by the Franklin Municipal Planning Commission, Franklin, Williamson County, Tennessee, with the exception of such conditions, if any, as are noted in the Planning Commission minutes for the _____day of_____, 20___, and this plat has been approved for recording in the Register's Office of Williamson County, Tennessee.

Secretary
Franklin Municipal Planning Commission

Date

FINAL SUBDIVISION PLAT

FRANKLIN - WILLIAMSON COUNTY - TENNESSEE

TOTAL ACRES 9.89	TOTAL # OF LOTS 46
ACRES NEW RD/ST 2.40 (ROW)	L.F. OF NEW RD/ST 1203.01
ACRES OPEN SPACE 0.0	CIVIL DISTRICT 5th
DRAWN BY JAG	CLOSURE ERROR < 1:10,000
SCALE = 1"=50'	DATE = 03/14/16

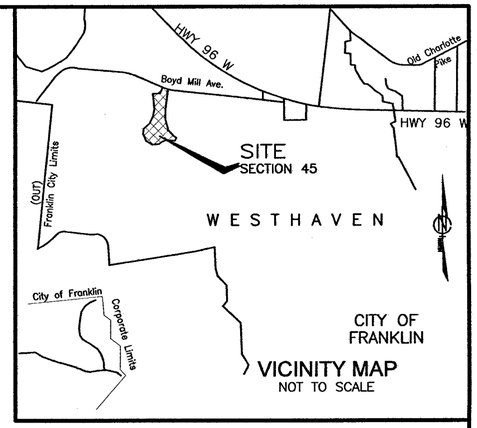
COF PROJECT # 6077 *SHEET 4 OF 5*

PARCEL AREA TABLE		
Parcel #	Area (SF)	Area (Ac.)
1790	11081.90	0.25
1791	8122.94	0.19
1792	6879.55	0.16
1793	7175.46	0.16
1794	7575.23	0.17
1795	8081.75	0.19
1796	8699.50	0.20
1797	10099.30	0.23
1798	12847.60	0.29
1799	9335.61	0.21
1800	6849.50	0.16
1801	7193.60	0.17
1802	7190.76	0.17
1803	10472.92	0.24
1804	10022.27	0.23
1805	6431.75	0.15
1806	6431.75	0.15
1807	9072.58	0.21
1808	8813.65	0.20
1809	6276.37	0.14

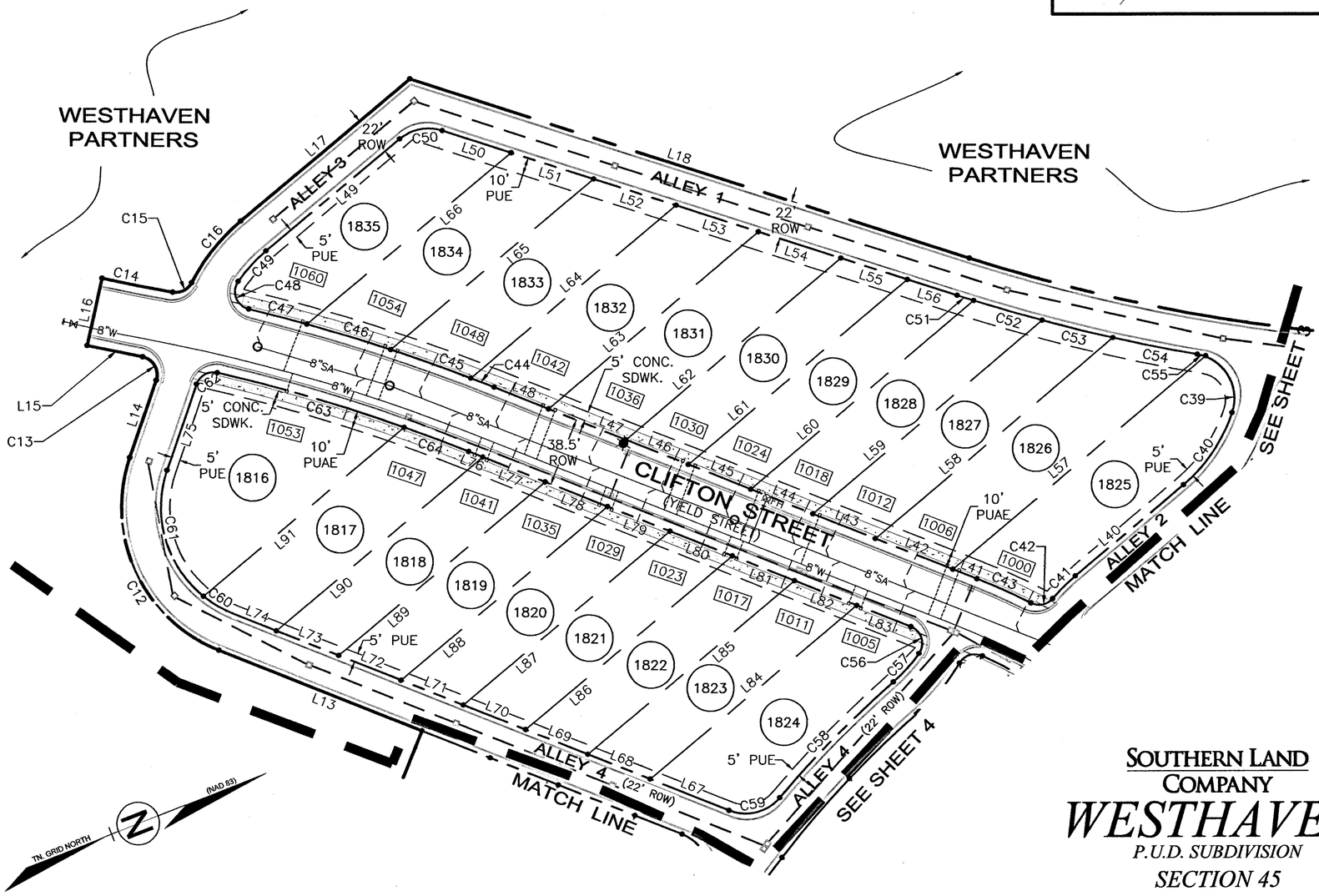
PARCEL AREA TABLE		
Parcel #	Area (SF)	Area (Ac.)
1810	6264.73	0.14
1811	7434.38	0.17
1812	6169.67	0.14
1813	6210.14	0.14
1814	5535.00	0.13
1815	5535.00	0.13
1816	9113.30	0.21
1817	6156.17	0.14
1818	4979.28	0.11
1819	4978.71	0.11
1820	4978.71	0.11
1821	4978.71	0.11
1822	4978.71	0.11
1823	4978.99	0.11
1824	7247.25	0.17
1825	7819.15	0.18
1826	7335.29	0.17
1827	5620.88	0.13
1828	5443.92	0.12
1829	5326.89	0.12

PARCEL AREA TABLE		
Parcel #	Area (SF)	Area (Ac.)
1830	5229.42	0.12
1831	6361.61	0.15
1832	6211.84	0.14
1833	6097.59	0.14
1834	6082.95	0.14
1835	6759.92	0.16

SITE DATA	
TOTAL AREA =	± 9.89 Ac. (430,665.93 sf)
TOTAL ROW =	± 2.39 Ac. (104,187.57 sf)
TOTAL LOT AREA =	± 7.49 Ac. (326,479.05 sf)



DETACHED RESIDENTIAL LOT TREE CHART							
Lot #	Lot Size	ACI	# Trees	Lot #	Lot Size	ACI	# Trees
1790	11,082 sf	12	4	1813	6210 sf	6	2
1791	8123 sf	6	2	1814	5535 sf	6	2
1792	6880 sf	6	2	1815	5535 sf	6	2
1793	7176 sf	6	2	1816	9113 sf	6	2
1794	7575 sf	6	2	1817	6156 sf	6	2
1795	8082 sf	6	2	1818	4979 sf	6	2
1796	8700 sf	6	2	1819	4979 sf	6	2
1797	10,099 sf	12	4	1820	4979 sf	6	2
1798	12,848 sf	12	4	1821	4979 sf	6	2
1799	9335 sf	6	2	1822	4979 sf	6	2
1800	6850 sf	6	2	1823	4979 sf	6	2
1801	7194 sf	6	2	1824	7247 sf	6	2
1802	7191 sf	6	2	1825	7819 sf	6	2
1803	10,473 sf	12	4	1826	7335 sf	6	2
1804	10,022 sf	12	4	1827	5621 sf	6	2
1805	6432 sf	6	2	1828	5444 sf	6	2
1806	6432 sf	6	2	1829	5327 sf	6	2
1807	9073 sf	6	2	1830	5229 sf	6	2
1808	8814 sf	6	2	1831	6362 sf	6	2
1809	6276 sf	6	2	1832	6212 sf	6	2
1810	6265 sf	6	2	1833	6098 sf	6	2
1811	7434 sf	6	2	1834	6083 sf	6	2
1812	6170 sf	6	2	1835	6760 sf	6	2



SOUTHERN LAND COMPANY

WESTHAVEN

P.U.D. SUBDIVISION

SECTION 45

Certificate of Survey

I (we) hereby certify that the subdivision plat as shown hereon is correct and that all of the monuments shown hereon have been placed as indicated. This subdivision plat correctly represents a survey made under my supervision on the 2nd day of February, 2016.

Joey C. Wilson, II, PE, RLS Tennessee RLS No. 2089
Wilson & Associates, P.C.
Engineering/Surveying/Environmental
108 Beasley Drive, Franklin, TN 37064
Office: 615.794.2275 FAX 615.794.2176
jwilson@wilsonpc.com

JOEY C. WILSON II REGISTERED LAND SURVEYOR AGRICULTURE COMMERCE TENNESSEE NO. 2089 4/1/16

50' 0' 50' 100' 150'
GRAPHIC SCALE

Legend		Legend (cont.)	
Existing Iron Rod	○	Water Valve	⋈
Iron Rod Set	●	Fire Hydrant	✖
Existing Concrete Monument	□	Street Light	✳
Concrete Monument Set	■	Sidewalk Pattern	
Storm Catchbasin	◘	Public Utility & Drainage Esmt.	P.U.D.E.
Sewer Manhole	⊙	Public Drainage Esmt.	P.D.E.
Street Address	1234	Public Utility & Access Esmt.	P.U.A.E.

CERTIFICATE OF APPROVAL OF RECORDING

Approved by the Franklin Municipal Planning Commission, Franklin, Williamson County, Tennessee, with the exception of such conditions, if any, as are noted in the Planning Commission minutes for the _____day of_____, 20___, and this plat has been approved for recording in the Register's Office of Williamson County, Tennessee.

Secretary — Date
Franklin Municipal Planning Commission

FINAL SUBDIVISION PLAT

FRANKLIN - WILLIAMSON COUNTY - TENNESSEE

TOTAL ACRES 9.89	TOTAL # OF LOTS 46
ACRES NEW RD/ST 2.40 (ROW)	L.F. OF NEW RD/ST 1203.01
ACRES OPEN SPACE 0.0	CIVIL DISTRICT 5th
DRAWN BY JAG	CLOSURE ERROR < 1:10,000
SCALE = 1"=50'	DATE = 03/14/16

COF PROJECT # 6077 *SHEET 5 OF 5*

COF no: 6045

CONDITIONS OF APPROVAL:

Engineering - Final Plat Checklist

General Comments

1. C. Final Plat

- The previous comment "The applicant shall show all drive aisle access easements on the lot such that one or more continuous paths are available between adjoining lots and/or public streets. This issue applies for connectivity with both existing and planned adjoining lots and/or public streets." was not completely addressed.

  - Provide access to the north across the project boundary to the access drive under construction.
  - Provide a sewer easement across lot 2 for the sewer main serving lot 1.
  - Provide stormwater detention and green infrastructure easements.
  - Provide access easements to the detention and green infrastructure.

2. C. Final Plat

- Per the Stormwater Management Ordinance (FMC 23-107(6)(e)), applicant shall place all Streamside Buffers in open space lots, to be maintained by the property owner or HOA. Commercial Developments shall be allowed to place Riparian Buffers in a Riparian Buffer Conservation Easement in lieu of open space lots.

Performance Agreement and Surety

General Comments

3. Engineering Sureties

-

Applicant shall post sureties in the following amounts:

II. City Sewer: $ 50,000
V. Traffic Signals $ 350,000

III. City Streets: $ 80,000 (TO BE POSTED WITH TDOT, per Carl Baughman's comment.)

Planning

General Comments

4. SD-X Zoning

- Applicant shall include correct density numbers.

5. Rear Yard Setback

- Applicant shall include correct rear yard setback.

6. One-Stop Procedure

- Due to the applicant's diligence in addressing staff comments and resolving most issues prior to resubmittal, this project is eligible for the One-Stop Post-PC review process. To participate in the One-Stop Post-PC process, the applicant must submit complete and corrected plans electronically through the IDT online review system by the scheduled One-Stop review date and be present at the One-Stop Center on the scheduled date and time that the One-Stop Post-PC service is available. The intent of One-Stop review is to close all outstanding conditions of approval and gain final document approval in an abbreviated time frame. Plans are reviewed on a first-come, first-serve basis in the One-Stop Center.

  - For eligible final plats, the applicant shall bring a mylar with all non-City Hall signatures provided. The applicant will also be required to establish required sureties prior to City Department signatures being applied. The sureties may be established after the one stop process.
  - In the case of site plans, the one stop process can only satisfy the City of Franklin review process. The review by State Authority and pre-construction meetings with staff in the field will still be required prior to the issue of stormwater and grading and/or utility construction permits.

If all conditions of approval have not been met at the scheduled One-Stop review, the applicant will be required to submit the project for additional review at another scheduled One-Stop date. The next available One-Stop Post-PC date is **[DATE]** and the applicant must check in at the One Stop center **between the hours of 8:00 and 11:00 a.m.** in order for their plans to be reviewed that day. The applicant may contact the Department of Building and Neighborhood Services with any questions regarding the process and for any future One-Stop Post-PC dates.

Water/Sewer

General Comments

7. Utility easement

- The site plan with the proposed sewer line locations has not been finalized. The final plat may require more comments on sewer easements once the locations are completed.

Applicant shall label the sewer line depths to ensure the proper easement widths are provided.

EASEMENTS

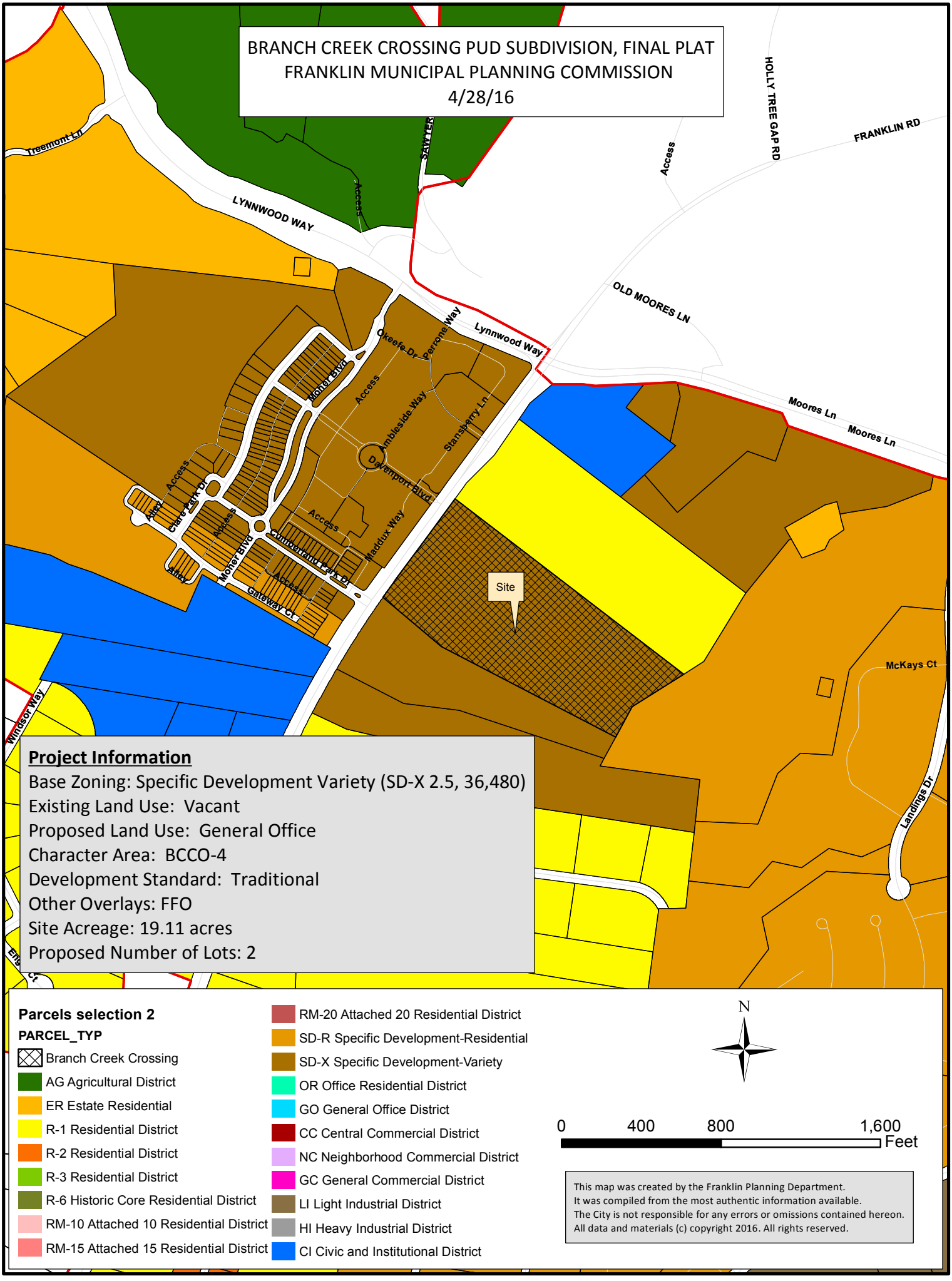
A. Water, Wastewater and/or Reclaimed Water Mains: When required, permanent exclusive easements must be provided with a minimum width of 20 feet. Easement width requirements are as follow:

1. 0'-12' depth requires 20' easement.

2. 13'-20' depth requires 30' easement.

3. Depths greater than 20' requires prior approval.

A minimum 10-foot wide temporary construction easement on each side of the permanent easement must also be provided. No trees shall be planted within the permanent easements.


BRANCH CREEK CROSSING PUD SUBDIVISION, FINAL PLAT
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/16
Treemont Ln
LYNNWOOD WAY
Access
SAWYER
Access
HOLLY TREE GAP RD
FRANKLIN RD
OLD MOORES LN
Lynnwood Way
Okeefe Dr
Parsons Way
Monar Blvd
Access
Amblerside Way
Stansberry Ln
Davenport Blvd
Moores Ln
Moores Ln
Access
Alley
Dard Park Dr
Access
Monar Blvd
Cumberland Park Dr
Maddux Way
Access
Alley
Gateway Ct
Site
McKays Ct
Landings Dr
Windsor Way
Project Information
Base Zoning: Specific Development Variety (SD-X 2.5, 36,480)
Existing Land Use: Vacant
Proposed Land Use: General Office
Character Area: BCCO-4
Development Standard: Traditional
Other Overlays: FFO
Site Acreage: 19.11 acres
Proposed Number of Lots: 2
Parcels selection 2
PARCEL_TYP
Branch Creek Crossing
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
400
800
1,600
Feet
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It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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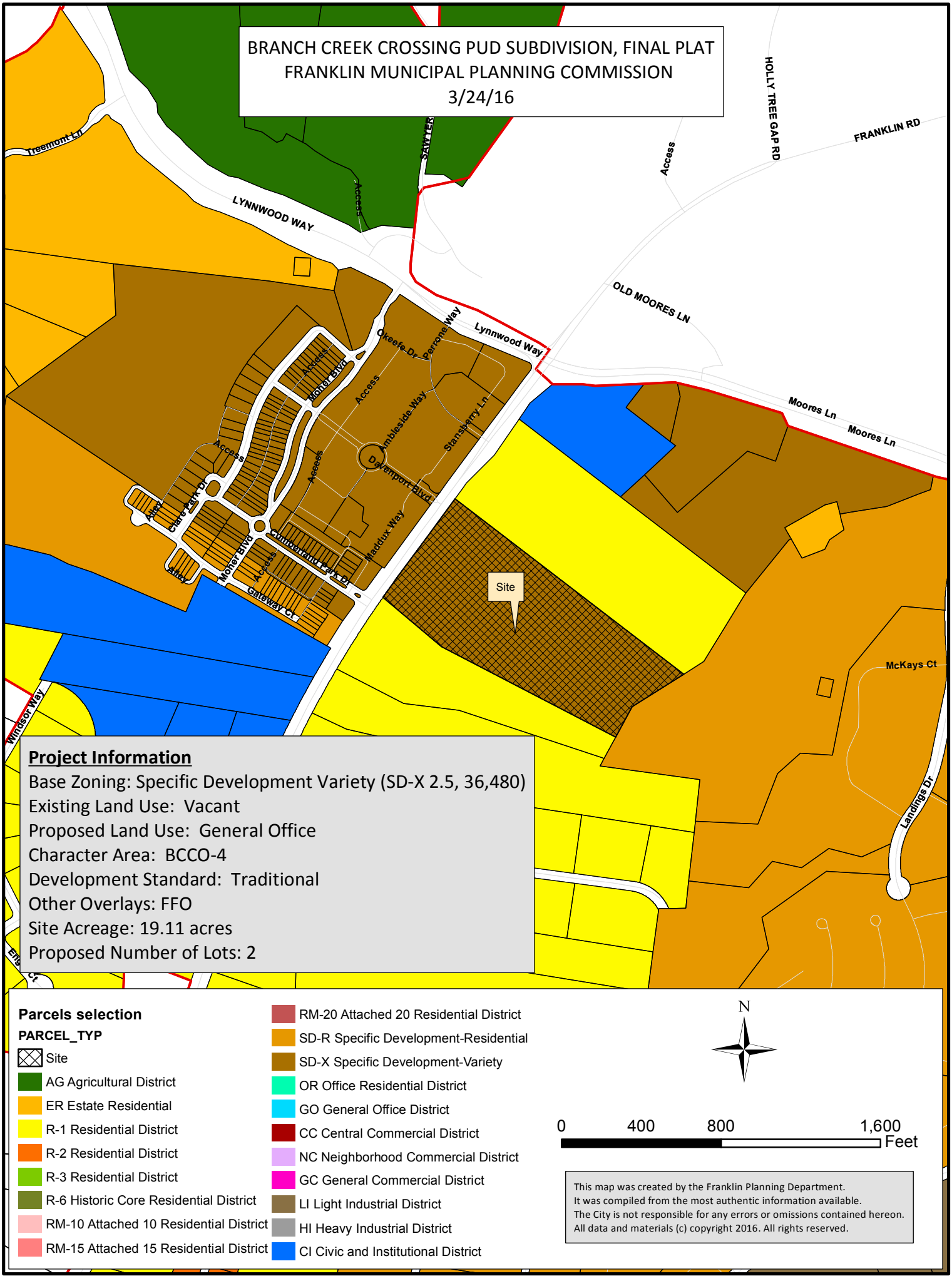

Project Information

Base Zoning: Specific Development Variety (SD-X 2.5, 36,480)
Existing Land Use: Vacant
Proposed Land Use: General Office
Character Area: BCCO-4
Development Standard: Traditional
Other Overlays: FFO
Site Acreage: 19.11 acres
Proposed Number of Lots: 2

Parcels selection

PARCEL_TYP

- Site
- AG Agricultural District
- ER Estate Residential
- R-1 Residential District
- R-2 Residential District
- R-3 Residential District
- R-6 Historic Core Residential District
- RM-10 Attached 10 Residential District
- RM-15 Attached 15 Residential District
- RM-20 Attached 20 Residential District
- SD-R Specific Development-Residential
- SD-X Specific Development-Variety
- OR Office Residential District
- GO General Office District
- CC Central Commercial District
- NC Neighborhood Commercial District
- GC General Commercial District
- LI Light Industrial District
- HI Heavy Industrial District
- CI Civic and Institutional District

N

0 400 800 1,600 Feet

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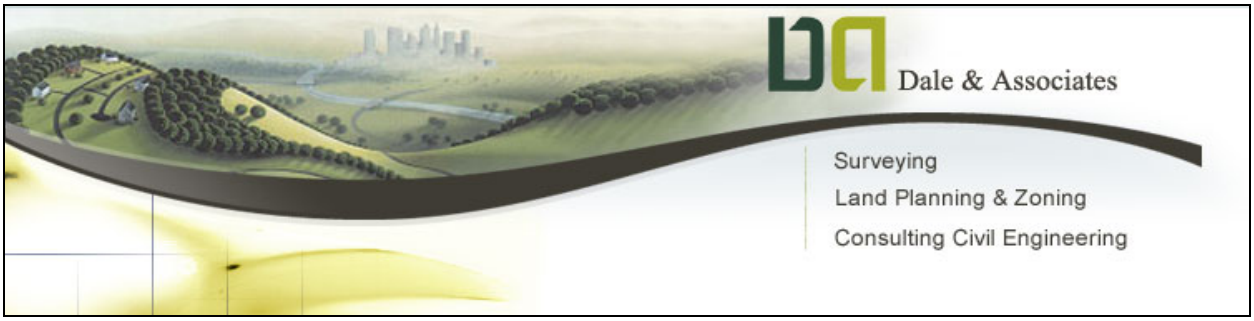


April 4, 2016

Amy Diaz-Barriga
City of Franklin Planning Department
109 3rd Avenue South
Franklin, Tennessee 37064

RE: Extension of Site Plan Approval for
Township PUD, Section 1
City of Franklin Project #5841

Dear Amy,

Please accept this letter on behalf of our Clients, Mr. JD Eatherly and Mr. Richard Chavez, proposed in order to request a six month Extension for the Site Plan approval for the first Section of the Township PUD (COF Project Number 5841). Although the Client is feverously pursuing the Building Permit and anxious to have it completed, the State Fire Marshal has slowed the process considerably. No significant modifications have been requested by the State, to my knowledge, however the review process has been more lengthy than expected.

As for revisions requested by the State Fire Marshal (as they pertain to the Site Plan), the most significant had to do with the relocation of the backflow prevention and double detector check valve & assembly from the previously shown location in front of the building to the rear/side of the building. No additional testing or concerns have been expressed other than that. Other concerns that are being addressed have to do with the interior of the building and not applicable to the Site Plan.

It is my understanding that Client is completing the financing and is ready to break ground as soon as the State approval and Building Permit's are available.

Please do not hesitate to contact me at 297-5166, Ext 115 should have any concerns or comments. Thanks again for all your assistance.

Sincerely,
Dale & Associates

Michael Garrigan
Michael Garrigan, PE
Civil Department Manager

HISTORIC FRANKLIN TENNESSEE

MEMORANDUM

DATE: April 20, 2016

TO: Franklin Municipal Planning Commission

FROM: Amy Diaz-Barriga, Current Planning Supervisor
Bob Martin, Interim Director of Planning and Sustainability

Subject

..title

Watson Glen Subdivision, final plat, Section 1, Revision 17, resubdivision of Lot 24 into 2 lots, on 20.54 acres, located at Oak Meadow Drive.

..body

Project Information

COF Project Number: 6091
Applicant: **Adam Crunk, Crunk Engineering**
Owner: **Warner Bass**

Background/Staff Comments

The purpose of this plat is to subdivide a large parcel of land into two buildable lots, and two open-space lots, in order to define the limits of a rezoning and development plan proposed for lot 24. A revision to this final plat will coincide with any site plan associated with lot 24. Access to South Royal Oaks Boulevard is not supported by Engineering, because of the left turn aisle and median along the length of lot 33. Also, the length of the lot line along Oak Meadow Drive for lot 33 is not long enough to allow an access point within lot 33. Under the proposed configuration, lot 33 would only be accessed through lot 24 along Oak Meadow Drive. The proposed rezoning for lot 24 is attached residential, so this plat sets up an undesirable situation of General Commercial traffic crossing in front of residential buildings. Because this plat is only being brought forward to coincide with the proposed rezoning, and the end result creates a situation where lot 33 cannot meet Franklin Street Standards, ultimately setting up an undesirable situation, the P&SD is recommending disapproval of the plat.

Recommendation

..recommendation

Disapproval.

..end

See attached pages for a list of staff recommended conditions of approval.

PROCEDURAL REQUIREMENTS:

1. In addition to uploading the corrected plat to the online plan review website (https://franklin.contractorsplanroom.com/secure/), the applicant shall submit the Mylar, to the Department of Building and Neighborhood Services (Suite 110, Franklin City Hall). The mylar shall

be 18 inches by 24 inches in size. The Certificates of Approval for the Subdivision Name and Street Names, Water System (if not COF Water), Survey, and Ownership shall be signed when the plat is resubmitted. The Mylar shall be submitted to BNS within five (5) business days of the corrected electronic plat being uploaded to the online plan review website (or vice versa) or the item shall be rejected as incomplete for City review. With the resubmittal, each condition of approval/open issue in the online plan review system shall contain a full response from the applicant as to the satisfaction or completion of that condition.

2. The city's project identification number shall be included on all correspondence with any city department relative to this project.
3. The applicant shall upload a .dwg copy of the final plat through the IDT system (link above) in Tennessee state plan coordinates, NAD 83, NAVD 88, zone 4100/5301 for incorporation of the plat into the Franklin GIS database.

COF no: 6091

CONDITIONS OF APPROVAL:

Engineering - Final Plat Checklist

General Comments

1. C. Final Plat

- The engineering department told the applicant at the original pre-application meeting that they should evaluate the proposed development and subdivisions of these parcels together and not separately. During the first round of review it was our understanding that access to lot 33 would one day be provided through a cross access easement from lot 24. After discussing this in detail we need to provide some additional clarity to this issue. Below is a new comment resulting from internal discussions.

Access to a corner lot fronting on an arterial street, and bordered by a collector or local street shall be required to have access **only from the collector** or local street. The engineering department is recommending disapproval of this final plat until we determine how the access will be provided from the collector roadway. On Collector streets, no driveway shall be established within two-hundred and thirty (230) feet of an intersecting street. Lot 33 does not have 230 feet of frontage. Lot 33 needs to have a commercial access to Oak Meadow Drive for engineering to support this subdivision.

The Existing median cut on S Royal Oaks Blvd was measured at approximately 450' from the radius return of Oak Meadow Drive. South Royal Oaks is one of 4 streets that provides East / West Connection from I-65 to Mack Hatcher Parkway. Access along this roadway should be limited and controlled. Access to South Royal Oaks will not be evaluated or approved until we have a traffic impact study and an access plan for lot 33 so that we can look at trip generation and distribution. The applicant shall change the lot lines and provide the necessary roadway frontage along Oak Meadow Drive to allow for a shared access to lot 33. The shared access shall be designed to handle the existing/proposed use (commercial/office).

Engineering is recommending disapproval of the proposed plat.

Performance Agreement and Surety

General Comments

2. Engineering Sureties

- No sureties are associated with this Final Plat. Another final plat will be submitted at the site plan stage. Applicant shall be informed that sureties are calculated on the site plan, and transferred to the final plat. Whatever work is proposed on said site plan, sureties will be expected to be posted for that site plan. If multiple parties or phases are involved, applicant shall take this into consideration when setting the limits of construction for each site plan.

(Previous comment restated for informational purposes only, no response necessary.)

Planning

WATSON GLEN SEC 1 REV 17 klb 2016-03-14.pdf

3. Mineral rights

- The applicant shall list who holds mineral rights on this property.

4. Iron Pins

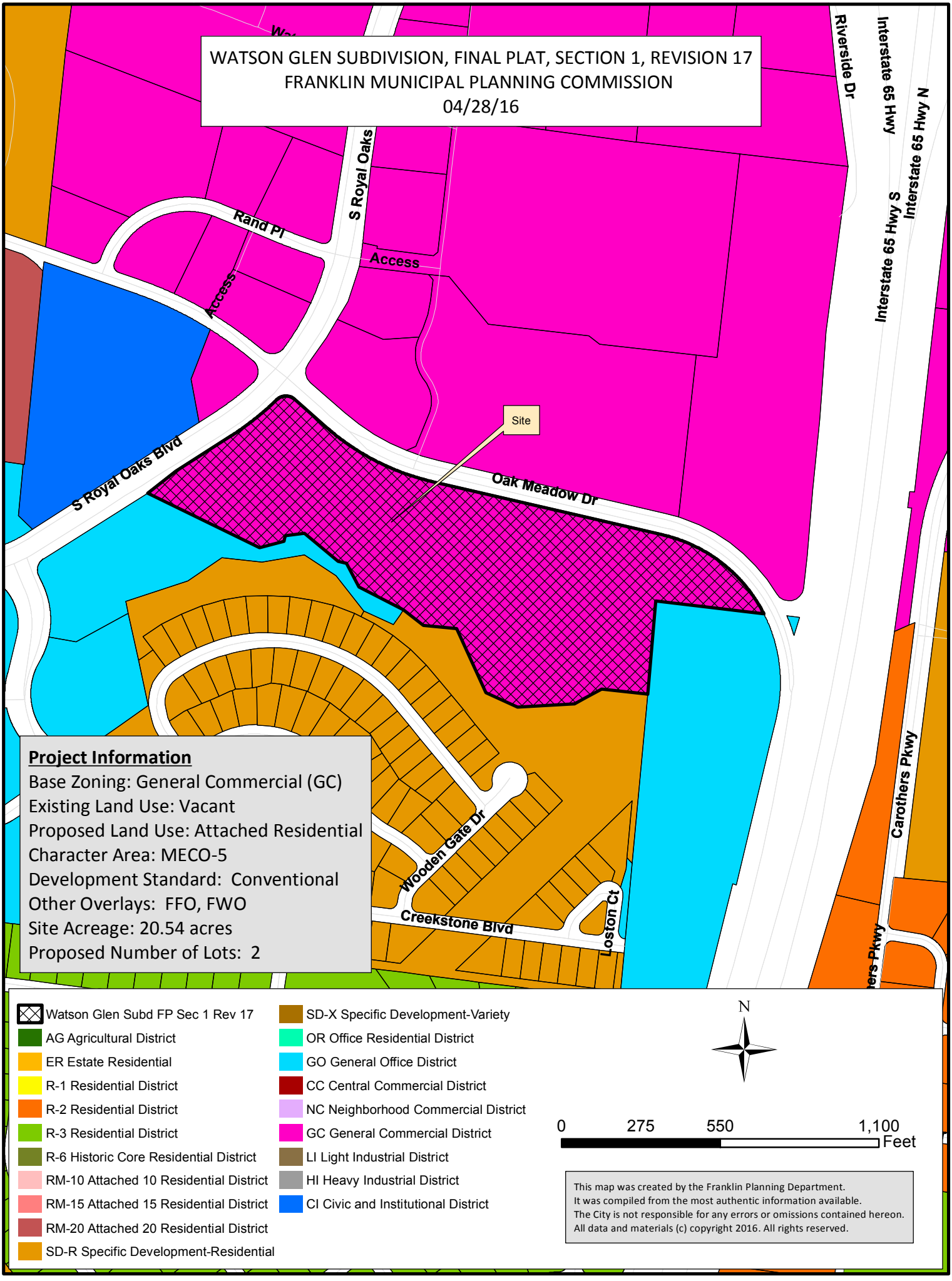
- An iron pin needs to be shown at the south terminus of the new lot line.

Stormwater

General Comments

5. Stream Buffer

- Watson Branch drains greater than 1 square mile thus a 60' Zone 1 buffer is required. Zone 2 buffers only apply on area than drain less than 1 square mile. Please revise.


WATSON GLEN SUBDIVISION, FINAL PLAT, SECTION 1, REVISION 17
FRANKLIN MUNICIPAL PLANNING COMMISSION
04/28/16
Riverside Dr
Interstate 65 Hwy
Interstate 65 Hwy N
Interstate 65 Hwy S
S Royal Oaks
Rand Pl
Access
Access
Site
S Royal Oaks Blvd
Oak Meadow Dr
Wooden Gate Dr
Creekstone Blvd
Loston Ct
Carothers Pkwy
Project Information
Base Zoning: General Commercial (GC)
Existing Land Use: Vacant
Proposed Land Use: Attached Residential
Character Area: MECO-5
Development Standard: Conventional
Other Overlays: FFO, FWO
Site Acreage: 20.54 acres
Proposed Number of Lots: 2
Watson Glen Subd FP Sec 1 Rev 17
AG Agricultural District
ER Estate Residential
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R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
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PROPERTY MAP REFERENCE

BEING A PORTION OF PARCEL NUMBER 088.00 AS SHOWN ON WILLIAMSON COUNTY PROPERTY MAP NUMBER 079.

PLAT REFERENCE

BEING A PORTION OF LOT 24 AS SHOWN ON THE FINAL PLAT ENTITLED "WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11" OF RECORD IN PLAT BOOK 29, PAGE 139, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.

DEED REFERENCE

BEING A PORTION OF THE SAME PROPERTY CONVEYED TO E. WARNER BASS BY QUITCLAIM DEED OF RECORD IN DEED BOOK 1347, PAGE 645 AND DEED BOOK 1347, PAGE 641, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.

SEE NOTE 2.

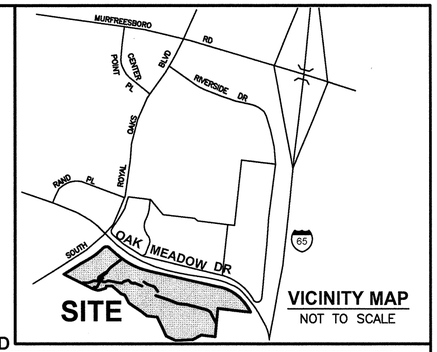
0 100 200 300

GENERAL NOTES

1. THE PURPOSE OF THIS PLAT IS TO RE-SUBDIVIDE LOT 24 INTO 2 BUILDABLE AND 2 OPEN SPACE LOTS.
2. BEARINGS SHOWN HEREON ARE BASED ON THE TENNESSEE COORDINATE SYSTEM OF 1983. GPS EQUIPMENT WAS USED DURING THE COURSE OF THE SURVEY ON THE SITE TO DETERMINE THE POSITION OF TWO CONTROL POINTS FOR ESTABLISHING THE BEARING BASE. THE EQUIPMENT USED: LEICA, MODEL GX 1230, DUAL FREQUENCY RECEIVER. THE TYPE OF SURVEY: NETWORK ADJUSTED REAL TIME KINEMATIC.
3. BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY, THIS PROPERTY LIES WITHIN FLOOD ZONE "X", AS DESIGNATED ON CURRENT FEDERAL EMERGENCY MANAGEMENT AGENCY MAP NO. 47187C0212F, WITH AN EFFECTIVE DATE OF SEPTEMBER 29, 2009, WHICH MAKES UP A PART OF THE NATIONAL FLOOD INSURANCE ADMINISTRATION REPORT; COMMUNITY NO. 47206, PANEL NO. 212, SUFFIX F, WHICH IS THE CURRENT FLOOD INSURANCE RATE MAP FOR THE COMMUNITY IN WHICH SAID PREMISES IS SITUATED. SAID MAP DEFINES ZONE "X" UNDER "OTHER AREAS" AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.
4. THIS PROPERTY IS CURRENTLY ZONED GC – (GENERAL COMMERCIAL). CHARACTER AREA OVERLAY: MECO-5, CONVENTIONAL DEVELOPMENT. FFO AND FWO OVERLAYS. MINIMUM YARD REQUIREMENTS PER CITY OF FRANKLIN ZONING ORDINANCE, DATED SEPTEMBER 29, 2014, ARE AS FOLLOWS:

   FRONT – 30' SIDE – 15 REAR – 25'

5. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
6. THE RECORDING OF THIS PLAT VOIDS, VACATES, AND SUPERSEDES THE RECORDING OF LOT 24 AS SHOWN ON THE FINAL PLAT OF "WATSON GLEN SUBIDIVISION, SECTION ONE, REVISION 10 (RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11) OF RECORD IN PLAT BOOK 29, PAGE 139, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.
7. THERE SHALL BE NO MOWING, CLEARING, GRADING, CONSTRUCTION, STORAGE, OR DISTURBANCE OF VEGETATION IN RIPARIAN BUFFERS EXCEPT AS PERMITTED BY THE CITY ENGINEER, OR HIS DESIGNEE.
8. ALL STREET LIGHT LOCATIONS AND QUANTITIES ARE APPROXIMATE. FINAL POSITIONING A ND QUANTITY SHALL BE AT THE DIRECTION OF MTEMC.
9. THIS SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. ABOVE GRADE AND UNDERGROUND UTILITIES SHOWN WERE TAKEN FROM VISIBLE APPURTENANCES AT THE SITE, PUBLIC RECORDS AND/OR MAPS PREPARED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. THEREFORE, RELIANCE UPON THE TYPE, SIZE AND LOCATION OF UTILITIES SHOWN SHOULD BE DONE SO WITH THIS CIRCUMSTANCE CONSIDERED. DETAILED VERIFICATION OF EXISTENCE, LOCATION AND DEPTH SHOULD ALSO BE MADE PRIOR TO ANY DECISION RELATIVE THERETO IS MADE. AVAILABILITY AND COST OF SERVICE SHOULD BE CONFIRMED WITH THE APPROPRIATE UTILITY COMPANY. IN TENNESSEE IT IS A REQUIREMENT, PER "THE UNDERGROUND UTILITY DAMAGE PREVENTION ACT", THAT ANYONE WHO ENGAGES IN EXCAVATION MUST NOTIFY ALL KNOWN UNDERGROUND UTILITY OWNERS, NO LESS THAN (3) THREE OR MORE THAN (10) TEN WORKING DAYS PRIOR TO THE DATE OF THEIR INTENT TO EXCAVATE AND ALSO TO AVOID ANY POSSIBLE HAZARD OR CONFLICT. TENNESSEE ONE CALL 811.
10. MAINTENANCE OF ALL STORMWATER MANAGEMENT FEATURES SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER(S) OR HOA.
11. WETLAND LOCATION SHOWN HEREON WAS TAKEN FROM MAPS AND COORDINATES OF WETLAND PERIMETER POINTS; AS PROVIDED BY BDY NATURAL SCIENCES CONSULTANTS DATE 12/22/2015.



VICINITY MAP
NOT TO SCALE

LEGEND

- CONCRETE MONUMENT (OLD)
- IRON ROD (OLD)
- IRON ROD (NEW) (5/8" X 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")
- CATCH BASIN/CURB INLET
- RCP REINFORCED CONCRETE PIPE
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- P TRANSFORMER PAD
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- –UGE– UNDERGROUND ELECTRIC LINE
- UTILITY POLE
- –X–X– FENCE
- ST STORM STRUCTURE
- FEMA ZONE "AE"
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- FEMA ZONE "X" (OTHER FLOOD AREAS)
- FWO FLOODWAY OVERLAY DISTRICT
- FFO FLOODWAY FRINGE OVERLAY DISTRICT
- X LOT NUMBER
- SIGN
- WATER VALVE
- LIGHT STANDARD
- oE ELECTRIC STUBOUT
- R.O.W.C.T. REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN

SOUTH ROYAL OAKS BOULEVARD

33

PORTION OF MAP 079, PARCEL 88.00
E. WARNER BASS, TRUSTEE
DEED BOOK 1347, PAGE 645
DEED BOOK 1347, PAGE 641
R.O.W.C.T.

SHEET 2

34
OPEN SPACE

27
CREEKSTONE COMMONS SUBDIVISION, REVISION 4
(RE-SUBDIVISION OF LOTS 15 AND 27)
PLAT BOOK P49, PAGE 110
R.O.W.C.T.

MAP 079O, GROUP C, PARCEL 025.00
CADENCE BANK, N.A.
DEED BOOK 5136, PAGE 628
R.O.W.C.T.

PORTION OF MAP 079, PARCEL 88.00
E. WARNER BASS, TRUSTEE
DEED BOOK 1347, PAGE 645
DEED BOOK 1347, PAGE 641
R.O.W.C.T.

OAK MEADOW DRIVE

REMAINING OF
24
WATSON GLEN SUBDIVISION SECTION 1, REVISION 10
PLAT BOOK 29, PAGE 139
R.O.W.C.T.

SHEET 3

35
OPEN SPACE

MATCH LINE

49 50 51 52 53 54 55 86 87 88 89 90

CREEKSTONE COMMONS P.U.D. SUBDIVISION, SECTION FOUR (RESUBDIVISION OF LOT 698)
PLAT BOOK P58, PAGE 10
R.O.W.C.T.

PORTION OF MAP 079, PARCEL 88.00
E. WARNER BASS, TRUSTEE
DEED BOOK 1347, PAGE 645
DEED BOOK 1347, PAGE 641
R.O.W.C.T.

MAP 079, PARCEL 101.05
NASHVILLE LODGE NO. 72 B.P.O. ELKS
DEED BOOK 1708, PAGE 12
R.O.W.C.T.

OPEN SPACE 808
MAP 079O, GROUP E, PARCEL 035.00
CREEKSTONE HOMEOWNER'S ASSOCIATION
DEED BOOK 6104, PAGE 222
R.O.W.C.T.

RECORDER'S INFORMATION

SURVEYOR
RAGAN-SMITH ASSOCIATES, INC.
KEVIN BIRDWELL, RLS
315 WOODLAND STREET
NASHVILLE, TENNESSEE 37206
(615) 244-8591
kbirdwell@ragansmith.com

OWNER
E. WARNER BASS, TRUSTEE
150 THIRD AVENUE SOUTH
SUITE 2800
NASHVILLE, TENNESSEE 37201
(615) 742-6210

DEVELOPER
EPOCH RESIDENTIAL
MCCARLEY DAVIS
EXECUTIVE VICE PRESIDENT
CHIEF INVESTMENT OFFICER
OFFICE (321)316-6005
CELL (407)489-2993

FINAL PLAT
WATSON GLEN SUBDIVISION
SECTION 1, REVISION 17
C.O.F. # 6091

2ND REVISION DATE: APRIL 7, 2016 PER REVIEW COMMENTS
REVISION DATE: MARCH 14, 2016 PER REVIEW COMMENTS
SUBMITTAL DATE: FEBRUARY 29, 2016

DRAWN BY: S. NAVE
JOB NO: 14034 W.O: 0338
SCALE: 1"=100'

FINAL SUBDIVISION PLAT
CITY OF FRANKLIN
WILLIAMSON COUNTY, TENNESSEE

NET AREA: 20.54 Acres± TOTAL LOTS: 2
ACRES NEW ROAD: N/A CIVIL DISTRICT: 9th
MILES NEW ROAD: N/A CLOSURE ERROR: 1:15000+

OWNER: E. WARNER BASS, TRUSTEE
SURVEYOR: RAGAN – SMITH – ASSOCIATES, INC.
SCALE: 1"=100' 0 50' 100' 200'

CERTIFICATE OF OWNERSHIP

I (WE) HEREBY CERTIFY THAT I AM (WE ARE) THE OWNER(S) OF THE PROPERTY SHOWN HEREON AS OF RECORD IN DEED BOOK 1347, PAGE 645 AND DEED BOOK 1347, PAGE 641, R.O.W.C.T. AND ADOPT THE PLAN OF SUBDIVISION OF THE PROPERTY AS SHOWN HEREON AND DEDICATED ALL PUBLIC WAYS AND EASEMENTS AS NOTED. NO LOT(S) AS SHOWN HEREON SHALL AGAIN BE SUBDIVIDED, RESUBDIVIDED, ALTERED OR CHANGED SO AS TO PRODUCE LESS AREA THAN IS HEREBY ESTABLISHED UNTIL OTHERWISE APPROVED BY THE FRANKLIN MUNICIPAL PLANNING COMMISSION, AND UNDER NO CONDITION SHALL LOT(S) BE MADE TO PRODUCE LESS AREA THAN IS PRESCRIBED BY THE RESTRICTIVE COVENANTS AS OF RECORD IN BOOK____, PAGE____, R.O.W.C., TENNESSEE, RUNNING WITH THE TITLE TO THE PROPERTY. I (WE) FURTHER CERTIFY THAT THERE ARE NO LIENS ON THIS PROPERTY, EXCEPT AS FOLLOWS: BOOK____, PAGE____, R.O.W.C.

E. WARNER BASS, TRUSTEE DATE

PRINT NAME AND TITLE

CERTIFICATE OF SURVEY

I (WE) HEREBY CERTIFY THAT THE SUBDIVISION PLAT AS SHOWN HEREON IS CORRECT AND THAT ALL OF THE MONUMENTS SHOWN HEREON HAVE BEEN PLACED AS INDICATED. THIS SUBDIVISION PLAT CORRECTLY REPRESENTS A SURVEY MADE UNDER MY SUPERVISION ON THE 11th DAY OF MARCH, 2011.

KEVIN O. BIRDWELL REGISTERED LAND SURVEYOR TENNESSEE NO 1797

SURVEYOR TENN. LICENSE NO. DATE

CERTIFICATE OF APPROVAL OF WATER AND SEWER SYSTEMS

I HEREBY CERTIFY THAT:

(1) THE WATER AND SEWER SYSTEMS DESIGNATED IN "WATSON GLEN SUBDIVISION SECTION 2, REVISION 1" HAVE BEEN INSTALLED IN ACCORDANCE WITH CITY SPECIFICATIONS, OR

(2) A PERFORMANCE AGREEMENT AND SURETY IN THE AMOUNT OF $_____FOR THE WATER SYSTEM AND $_____FOR THE SEWER SYSTEM HAS BEEN POSTED WITH THE CITY OF FRANKLIN, TENNESSEE, TO ASSURE COMPLETION OF SUCH SYSTEMS.

DIRECTOR WATER MANAGEMENT DEPARTMENT DATE
CITY OF FRANKLIN, TENNESSEE

CERTIFICATE OF APPROVAL OF STREETS AND DRAINAGE

I HEREBY CERTIFY THAT:

(1) THE STREETS AND DRAINAGE IN MEDCORE MEDICAL BUILDING HAVE BEEN INSTALLED IN ACCORDANCE WITH CITY SPECIFICATIONS, OR

(2) A PERFORMANCE BOND IN THE AMOUNT OF $_____FOR STREETS AND $_____FOR DRAINAGE HAS BEEN POSTED WITH THE CITY OF FRANKLIN, TENNESSEE, TO ASSURE COMPLETION OF SUCH IMPROVEMENTS.

SUPERINTENDENT, STREETS DATE
FRANKLIN, TENNESSEE

CERTIFICATE OF THE APPROVAL OF SUBDIVISION NAME AND STREET NAMES

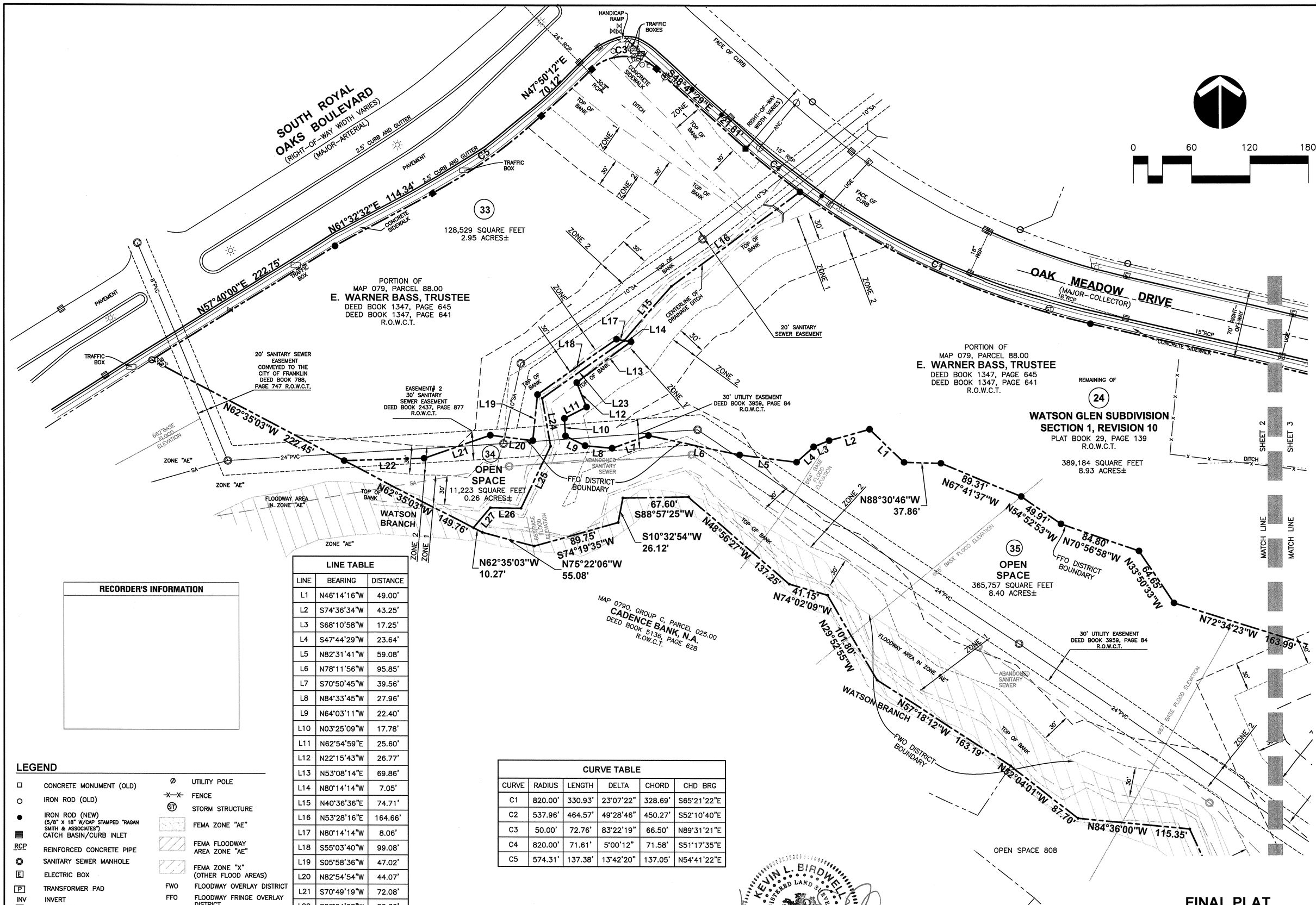
SUBDIVISION NAME AND STREET NAMES APPROVED BY THE WILLIAMSON COUNTY EMERGENCY MANAGEMENT AGENCY.

WILLIAMSON COUNTY EMERGENCY DATE
MANAGEMENT AGENCY

CERTIFICATE OF APPROVAL FOR RECORDING

APPROVED BY THE FRANKLIN MUNICIPAL PLANNING COMMISSION, FRANKLIN, WILLIAMSON COUNTY, TENNESSEE, WITH THE EXCEPTION OF SUCH CONDITIONS, IF ANY, AS ARE NOTED IN THE PLANNING COMMISSION MINUTES FOR THE ___ DAY OF OCTOBER, 2010, AND THIS PLAT HAS BEEN APPROVED FOR RECORDING IN THE REGISTER'S OFFICE FOR WILLIAMSON COUNTY.

SECRETARY DATE
FRANKLIN MUNICIPAL PLANNING COMMISSION



LINE TABLE		
LINE	BEARING	DISTANCE
L1	N46°14'16"W	49.00'
L2	S74°36'34"W	43.25'
L3	S68°10'58"W	17.25'
L4	S47°44'29"W	23.64'
L5	N82°31'41"W	59.08'
L6	N78°11'56"W	95.85'
L7	S70°50'45"W	39.56'
L8	N84°33'45"W	27.96'
L9	N64°03'11"W	22.40'
L10	N03°25'09"W	17.78'
L11	N62°54'59"E	25.60'
L12	N22°15'43"W	26.77'
L13	N53°08'14"E	69.86'
L14	N80°14'14"W	7.05'
L15	N40°36'36"E	74.71'
L16	N53°28'16"E	164.66'
L17	N80°14'14"W	8.06'
L18	S55°03'40"W	99.08'
L19	S05°58'36"W	47.02'
L20	N82°54'54"W	44.07'
L21	S70°49'19"W	72.08'
L22	S88°04'08"W	82.32'
L23	N54°59'41"E	103.02'
L24	N10°00'40"W	49.37'
L25	N25°32'12"E	70.78'
L26	S89°07'57"E	31.47'
L27	N39°40'55"E	27.30'

CURVE TABLE					
CURVE	RADIUS	LENGTH	DELTA	CHORD	CHD BRG
C1	820.00'	330.93'	23°07'22"	328.69'	S65°21'22"E
C2	537.96'	464.57'	49°28'46"	450.27'	S52°10'40"E
C3	50.00'	72.76'	83°22'19"	66.50'	N89°31'21"E
C4	820.00'	71.61'	5°00'12"	71.58'	S51°17'35"E
C5	574.31'	137.38'	13°42'20"	137.05'	N54°41'22"E

RECORDER'S INFORMATION

LEGEND

- CONCRETE MONUMENT (OLD)
- IRON ROD (OLD)
- IRON ROD (NEW) (5/8" X 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")
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- SIGN
- WATER VALVE
- LIGHT STANDARD
- E ELECTRIC STUBOUT
- R.O.W.C.T. REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN

KEVIN L. BIRDWELL
REGISTERED LAND SURVEYOR
TENNESSEE NO. 1179

FINAL PLAT
WATSON GLEN SUBDIVISION
SECTION 1, REVISION 17

C.O.F. # 6091

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- P TRANSFORMER PAD
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- –UGE– UNDERGROUND ELECTRIC LINE
- Ø UTILITY POLE
- –X–X– FENCE
- (ST) STORM STRUCTURE
- FEMA ZONE "AE"
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- FEMA ZONE "X" (OTHER FLOOD AREAS)
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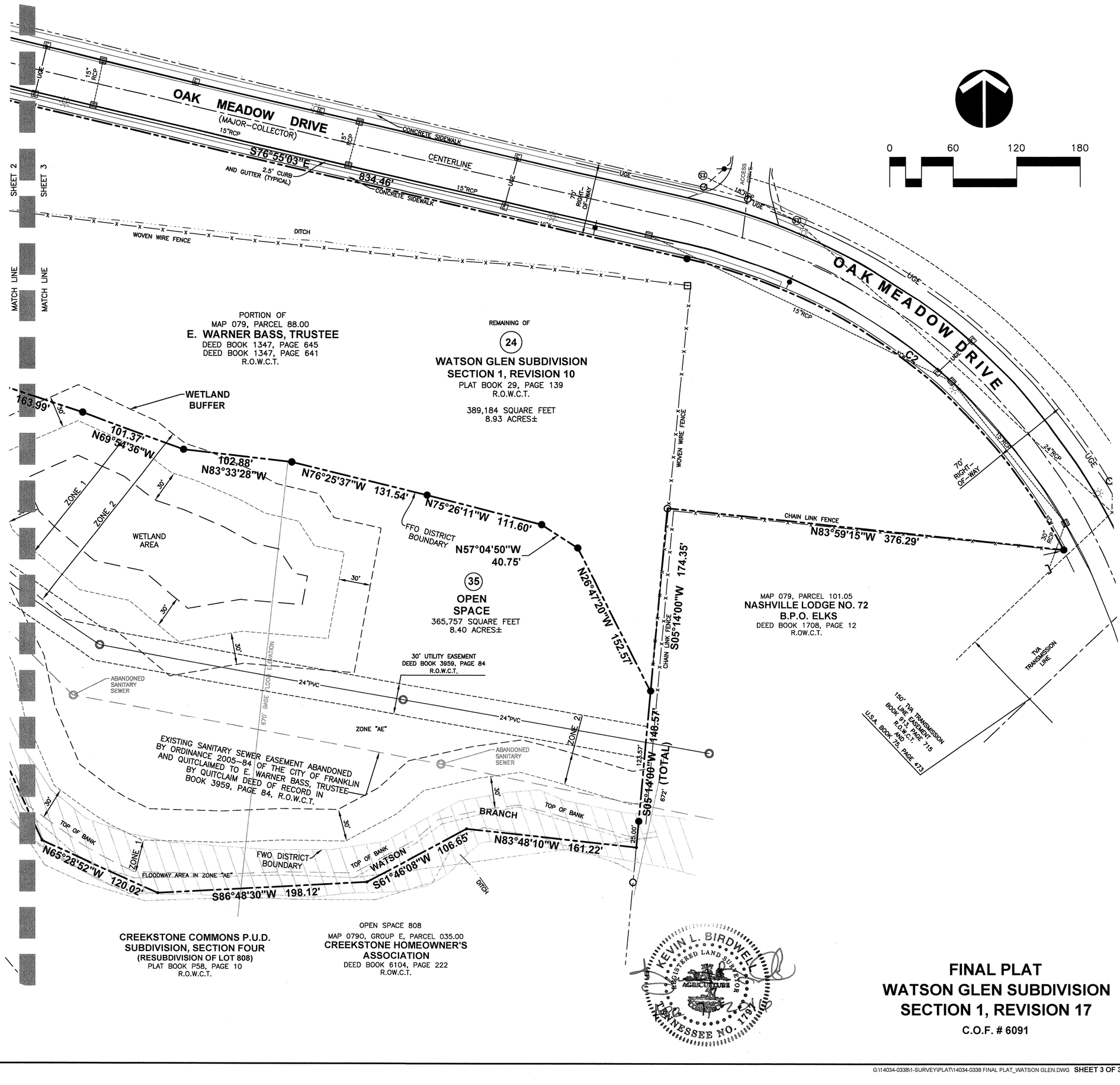
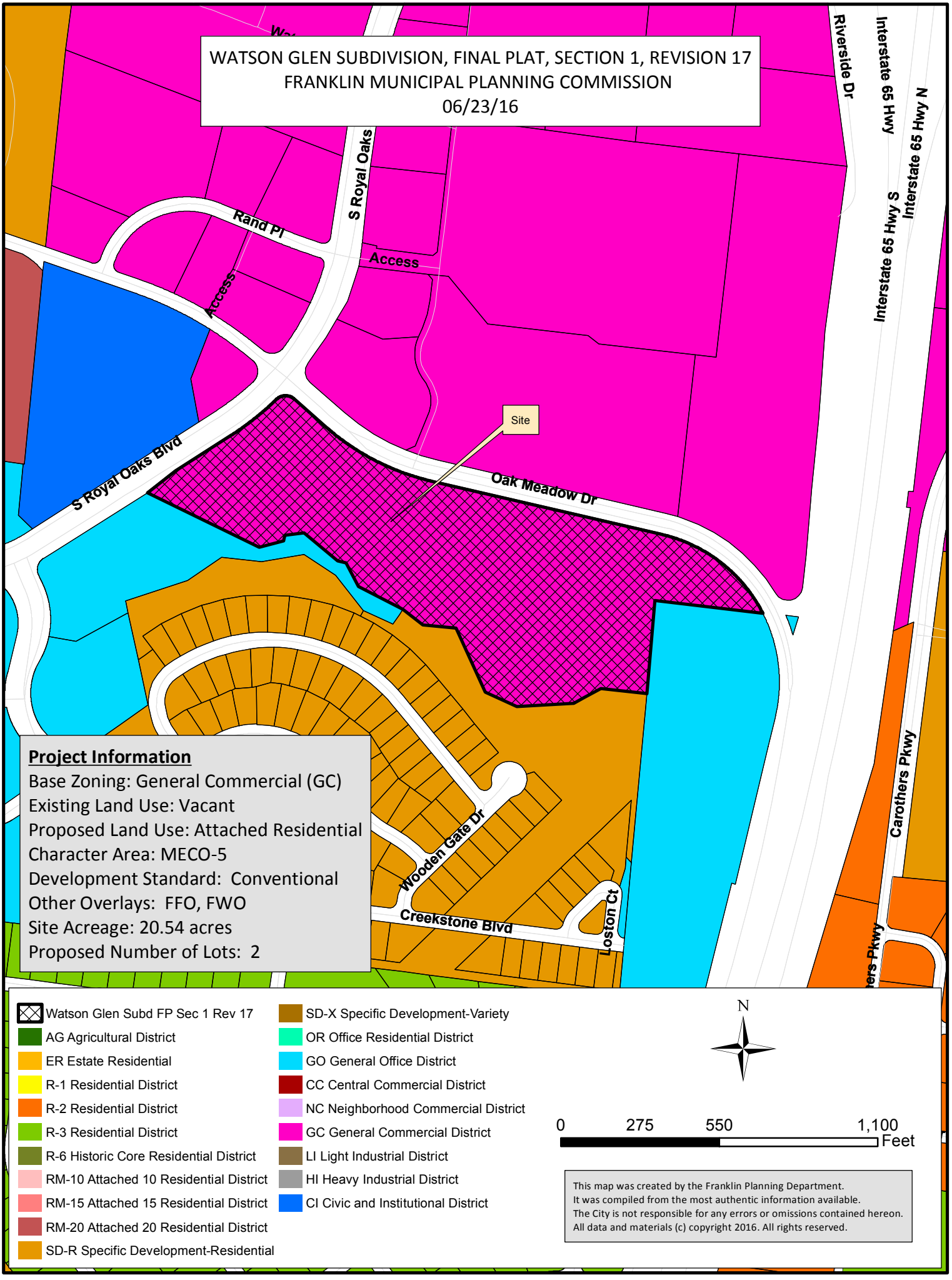
- FFO FLOODWAY FRINGE OVERLAY DISTRICT
- (X) LOT NUMBER
- SIGN
- WATER VALVE
- LIGHT STANDARD
- ELECTRIC STUBOUT
- R.O.W.C.T. REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN



FINAL PLAT
WATSON GLEN SUBDIVISION
SECTION 1, REVISION 17

C.O.F. # 6091


WATSON GLEN SUBDIVISION, FINAL PLAT, SECTION 1, REVISION 17
FRANKLIN MUNICIPAL PLANNING COMMISSION
06/23/16
Riverside Dr
Interstate 65 Hwy
Interstate 65 Hwy N
Interstate 65 Hwy S
S Royal Oaks
Rand Pl
Access
Access
Site
S Royal Oaks Blvd
Oak Meadow Dr
Carothers Pkwy
Wooden Gate Dr
Creekstone Blvd
Loston Ct
Project Information
Base Zoning: General Commercial (GC)
Existing Land Use: Vacant
Proposed Land Use: Attached Residential
Character Area: MECO-5
Development Standard: Conventional
Other Overlays: FFO, FWO
Site Acreage: 20.54 acres
Proposed Number of Lots: 2
Watson Glen Subd FP Sec 1 Rev 17
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
275
550
1,100
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
All data and materials (c) copyright 2016. All rights reserved.

PROPERTY MAP REFERENCE

BEING A PORTION OF PARCEL NUMBER 088.00 AS SHOWN ON WILLIAMSON COUNTY PROPERTY MAP NUMBER 079.

PLAT REFERENCE

BEING A PORTION OF LOT 24 AS SHOWN ON THE FINAL PLAT ENTITLED "WATSON GLEN SUBDIVISION, SECTION 1, REVISION 10, RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11" OF RECORD IN PLAT BOOK 29, PAGE 139, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.

DEED REFERENCE

BEING A PORTION OF THE SAME PROPERTY CONVEYED TO E. WARNER BASS BY QUITCLAIM DEED OF RECORD IN DEED BOOK 1347, PAGE 645 AND DEED BOOK 1347, PAGE 641, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.

SEE NOTE 2.

0 100 200 300

GENERAL NOTES

1. THE PURPOSE OF THIS PLAT IS TO RE-SUBDIVIDE LOT 24 INTO 2 BUILDABLE AND 2 OPEN SPACE LOTS.
2. BEARINGS SHOWN HEREON ARE BASED ON THE TENNESSEE COORDINATE SYSTEM OF 1983. GPS EQUIPMENT WAS USED DURING THE COURSE OF THE SURVEY ON THE SITE TO DETERMINE THE POSITION OF TWO CONTROL POINTS FOR ESTABLISHING THE BEARING BASE. THE EQUIPMENT USED: LEICA, MODEL GX 1230, DUAL FREQUENCY RECEIVER. THE TYPE OF SURVEY: NETWORK ADJUSTED REAL TIME KINEMATIC.
3. BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY, THIS PROPERTY LIES WITHIN FLOOD ZONE "X", AS DESIGNATED ON CURRENT FEDERAL EMERGENCY MANAGEMENT AGENCY MAP NO. 47187C0212F, WITH AN EFFECTIVE DATE OF SEPTEMBER 29, 2009, WHICH MAKES UP A PART OF THE NATIONAL FLOOD INSURANCE ADMINISTRATION REPORT; COMMUNITY NO. 47206, PANEL NO. 212, SUFFIX F, WHICH IS THE CURRENT FLOOD INSURANCE RATE MAP FOR THE COMMUNITY IN WHICH SAID PREMISES IS SITUATED. SAID MAP DEFINES ZONE "X" UNDER "OTHER AREAS" AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.
4. THIS PROPERTY IS CURRENTLY ZONED GC – (GENERAL COMMERCIAL). CHARACTER AREA OVERLAY: MECO-5, CONVENTIONAL DEVELOPMENT. FFO AND FWO OVERLAYS. MINIMUM YARD REQUIREMENTS PER CITY OF FRANKLIN ZONING ORDINANCE, DATED SEPTEMBER 29, 2014, ARE AS FOLLOWS:

   FRONT – 30' SIDE – 15 REAR – 25'

5. WITHIN NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS), GAS, SEWER, TELEPHONE, AND WATER LINES SHALL BE PLACED UNDERGROUND.
6. THE RECORDING OF THIS PLAT VOIDS, VACATES, AND SUPERSEDES THE RECORDING OF LOT 24 AS SHOWN ON THE FINAL PLAT OF "WATSON GLEN SUBIDIVISION, SECTION ONE, REVISION 10 (RESUBDIVISION OF LOT 2 AND OF RIVERSIDE BUSINESS PARK SUBDIVISION, SECTION 1, REVISION 4, LOT 11) OF RECORD IN PLAT BOOK 29, PAGE 139, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.
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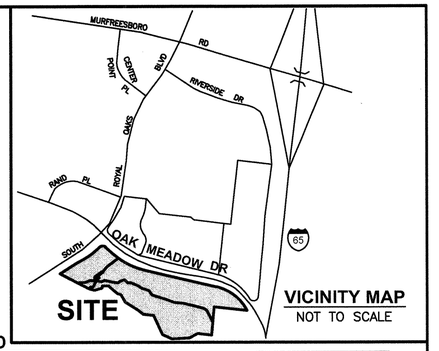
11. WETLAND LOCATION SHOWN HEREON WAS TAKEN FROM MAPS AND COORDINATES OF WETLAND PERIMETER POINTS; AS PROVIDED BY BDY NATURAL SCIENCES CONSULTANTS DATE 12/22/2015.
12. THERE ARE NO MINERAL RIGHTS THAT AFFECT THIS PROPERTY PER FINDINGS DISCLOSED IN FIDELITY NATIONAL TITLE INSURANCE COMPANY'S COMMITMENT FOR TITLE INSURANCE NO. 1514121CTN, DATED AUGUST 27, 2015.



VICINITY MAP
NOT TO SCALE

LEGEND

□	CONCRETE MONUMENT (OLD)
○	IRON ROD (OLD)
●	IRON ROD (NEW) (5/8" x 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")
▤	CATCH BASIN/CURB INLET
RCP	REINFORCED CONCRETE PIPE
◎	SANITARY SEWER MANHOLE
E	ELECTRIC BOX
P	TRANSFORMER PAD
INV	INVERT
⌒	HEADWALL
⊛	FIRE HYDRANT
FO	FIBER OPTIC BOX
–UGE–	UNDERGROUND ELECTRIC LINE
⌀	UTILITY POLE
–X–X–	FENCE
ST	STORM STRUCTURE
	FEMA FLOODWAY AREA ZONE "AE"
	FEMA ZONE "X" (OTHER FLOOD AREAS)
FWO	FLOODWAY OVERLAY DISTRICT
FFO	FLOODWAY FRINGE OVERLAY DISTRICT
(X)	LOT NUMBER
⊸	SIGN
⋈	WATER VALVE
✲	LIGHT STANDARD
oE	ELECTRIC STUBOUT
R.O.W.C.T.	REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN

SOUTH ROYAL OAKS BOULEVARD

RIGHT-OF-WAY DEDICATION

OAK MEADOW DRIVE

(33)

PORTION OF MAP 079, PARCEL 88.00
E. WARNER BASS, TRUSTEE
DEED BOOK 1347, PAGE 645
DEED BOOK 1347, PAGE 641
R.O.W.C.T.

SHEET 2

(34) OPEN SPACE

(27) CREEKSTONE COMMONS SUBDIVISION, REVISION 4
(RE-SUBDIVISION OF LOTS 15 AND 27)
PLAT BOOK P49, PAGE 110
R.O.W.C.T.

MAP 079O, GROUP C, PARCEL 025.00
CADENCE BANK, N.A.
DEED BOOK 5136, PAGE 628
R.O.W.C.T.

PORTION OF MAP 079, PARCEL 88.00
E. WARNER BASS, TRUSTEE
DEED BOOK 1347, PAGE 645
DEED BOOK 1347, PAGE 641
R.O.W.C.T.

(35) OPEN SPACE

MATCH LINE

REMAINING OF (24)
WATSON GLEN SUBDIVISION
SECTION 1, REVISION 10
PLAT BOOK 29, PAGE 139
R.O.W.C.T.

SHEET 3

PORTION OF MAP 079, PARCEL 88.00
E. WARNER BASS, TRUSTEE
DEED BOOK 1347, PAGE 645
DEED BOOK 1347, PAGE 641
R.O.W.C.T.

MAP 079, PARCEL 101.05
NASHVILLE LODGE NO. 72
B.P.O. ELKS
DEED BOOK 1708, PAGE 12
R.O.W.C.T.

49 50 51 52 53 54 55 86 87 88 89 90

CREEKSTONE COMMONS P.U.D. SUBDIVISION, SECTION FOUR
(RESUBDIVISION OF LOT 808)
PLAT BOOK 6258, PAGE 10
R.O.W.C.T.

OPEN SPACE 808
MAP 0790, GROUP E, PARCEL 035.00
CREEKSTONE HOMEOWNER'S ASSOCIATION
DEED BOOK 6104, PAGE 222
R.O.W.C.T.

RECORDER'S INFORMATION

SURVEYOR
RAGAN–SMITH ASSOCIATES, INC.
KEVIN BIRDWELL, RLS
315 WOODLAND STREET
NASHVILLE, TENNESSEE 37206
(615) 244–8591
kbirdwell@ragansmith.com

OWNER
E. WARNER BASS, TRUSTEE
150 THIRD AVENUE SOUTH
SUITE 2800
NASHVILLE, TENNESSEE 37201
(615) 742–6210

DEVELOPER
EPOCH RESIDENTIAL
MCCARLEY DAVIS
EXECUTIVE VICE PRESIDENT
CHIEF INVESTMENT OFFICER
OFFICE (321)316–6005
CELL (407)489–2993

CERTIFICATE OF OWNERSHIP
I (WE) HEREBY CERTIFY THAT I AM (WE ARE) THE OWNER(S) OF THE PROPERTY SHOWN HEREON AS OF RECORD IN DEED BOOK 1347, PAGE 645 AND DEED BOOK 1347, PAGE 641, R.O.W.C.T. AND ADOPT THE PLAN OF SUBDIVISION OF THE PROPERTY AS SHOWN HEREON AND DEDICATED ALL PUBLIC WAYS AND EASEMENTS AS NOTED. NO LOT(S) AS SHOWN HEREON SHALL AGAIN BE SUBDIVIDED, RESUBDIVIDED, ALTERED OR CHANGED SO AS TO PRODUCE LESS AREA THAN IS HEREBY ESTABLISHED UNTIL OTHERWISE APPROVED BY THE FRANKLIN MUNICIPAL PLANNING COMMISSION, AND UNDER NO CONDITION SHALL LOT(S) BE MADE TO PRODUCE LESS AREA THAN IS PRESCRIBED BY THE RESTRICTIVE COVENANTS AS OF RECORD IN BOOK____, PAGE____, R.O.W.C., TENNESSEE, RUNNING WITH THE TITLE TO THE PROPERTY. I (WE) FURTHER CERTIFY THAT THERE ARE NO LIENS ON THIS PROPERTY, EXCEPT AS FOLLOWS: BOOK____, PAGE____, R.O.W.C.

E. WARNER BASS, TRUSTEE — DATE

PRINT NAME AND TITLE

CERTIFICATE OF SURVEY
I (WE) HEREBY CERTIFY THAT THE SUBDIVISION PLAT AS SHOWN HEREON IS CORRECT AND THAT ALL OF THE MONUMENTS SHOWN HEREON HAVE BEEN PLACED AS INDICATED. THIS SUBDIVISION PLAT CORRECTLY REPRESENTS A SURVEY MADE UNDER MY SUPERVISION ON THE 11th DAY OF MARCH, 2011.

KEVIN L. BIRDWELL — REGISTERED LAND SURVEYOR — AGRICULTURE — TENNESSEE NO. 1797

1797 — 6.2.16

SURVEYOR, TENN. LICENSE — DATE

CERTIFICATE OF APPROVAL OF WATER AND SEWER SYSTEMS
I HEREBY CERTIFY THAT:

(1) THE WATER AND SEWER SYSTEMS DESIGNATED IN "WATSON GLEN SUBDIVISION SECTION 2, REVISION 1" HAVE BEEN INSTALLED IN ACCORDANCE WITH CITY SPECIFICATIONS, OR

(2) A PERFORMANCE AGREEMENT AND SURETY IN THE AMOUNT OF $_____ FOR THE WATER SYSTEM AND $_____ FOR THE SEWER SYSTEM HAS BEEN POSTED WITH THE CITY OF FRANKLIN, TENNESSEE, TO ASSURE COMPLETION OF SUCH SYSTEMS.

DIRECTOR WATER MANAGEMENT DEPARTMENT CITY OF FRANKLIN, TENNESSEE — DATE

CERTIFICATE OF APPROVAL OF STREETS AND DRAINAGE
I HEREBY CERTIFY THAT:

(1) THE STREETS AND DRAINAGE IN MEDCORE MEDICAL BUILDING HAVE BEEN INSTALLED IN ACCORDANCE WITH CITY SPECIFICATIONS, OR

(2) A PERFORMANCE BOND IN THE AMOUNT OF $_____ FOR STREETS AND $_____ FOR DRAINAGE HAS BEEN POSTED WITH THE CITY OF FRANKLIN, TENNESSEE, TO ASSURE COMPLETION OF SUCH IMPROVEMENTS.

SUPERINTENDENT, STREETS FRANKLIN, TENNESSEE — DATE

CERTIFICATE OF THE APPROVAL OF SUBDIVISION NAME AND STREET NAMES
SUBDIVISION NAME AND STREET NAMES APPROVED BY THE WILLIAMSON COUNTY EMERGENCY MANAGEMENT AGENCY.

WILLIAMSON COUNTY EMERGENCY MANAGEMENT AGENCY — DATE

CERTIFICATE OF APPROVAL FOR RECORDING
APPROVED BY THE FRANKLIN MUNICIPAL PLANNING COMMISSION, FRANKLIN, WILLIAMSON COUNTY, TENNESSEE, WITH THE EXCEPTION OF SUCH CONDITIONS, IF ANY, AS ARE NOTED IN THE PLANNING COMMISSION MINUTES FOR THE ___ DAY OF OCTOBER, 2010, AND THIS PLAT HAS BEEN APPROVED FOR RECORDING IN THE REGISTER'S OFFICE FOR WILLIAMSON COUNTY.

SECRETARY FRANKLIN MUNICIPAL PLANNING COMMISSION — DATE

FINAL PLAT
WATSON GLEN SUBDIVISION
SECTION 1, REVISION 17
C.O.F. # 6091

4TH REVISION DATE: JUNE 2, 2016 PER REVIEW COMMENTS
3RD REVISION DATE: MAY 9, 2016 PER REVIEW COMMENTS
2ND REVISION DATE: APRIL 7, 2016 PER REVIEW COMMENTS
REVISION DATE: MARCH 14, 2016 PER REVIEW COMMENTS
SUBMITTAL DATE: FEBRUARY 29, 2016

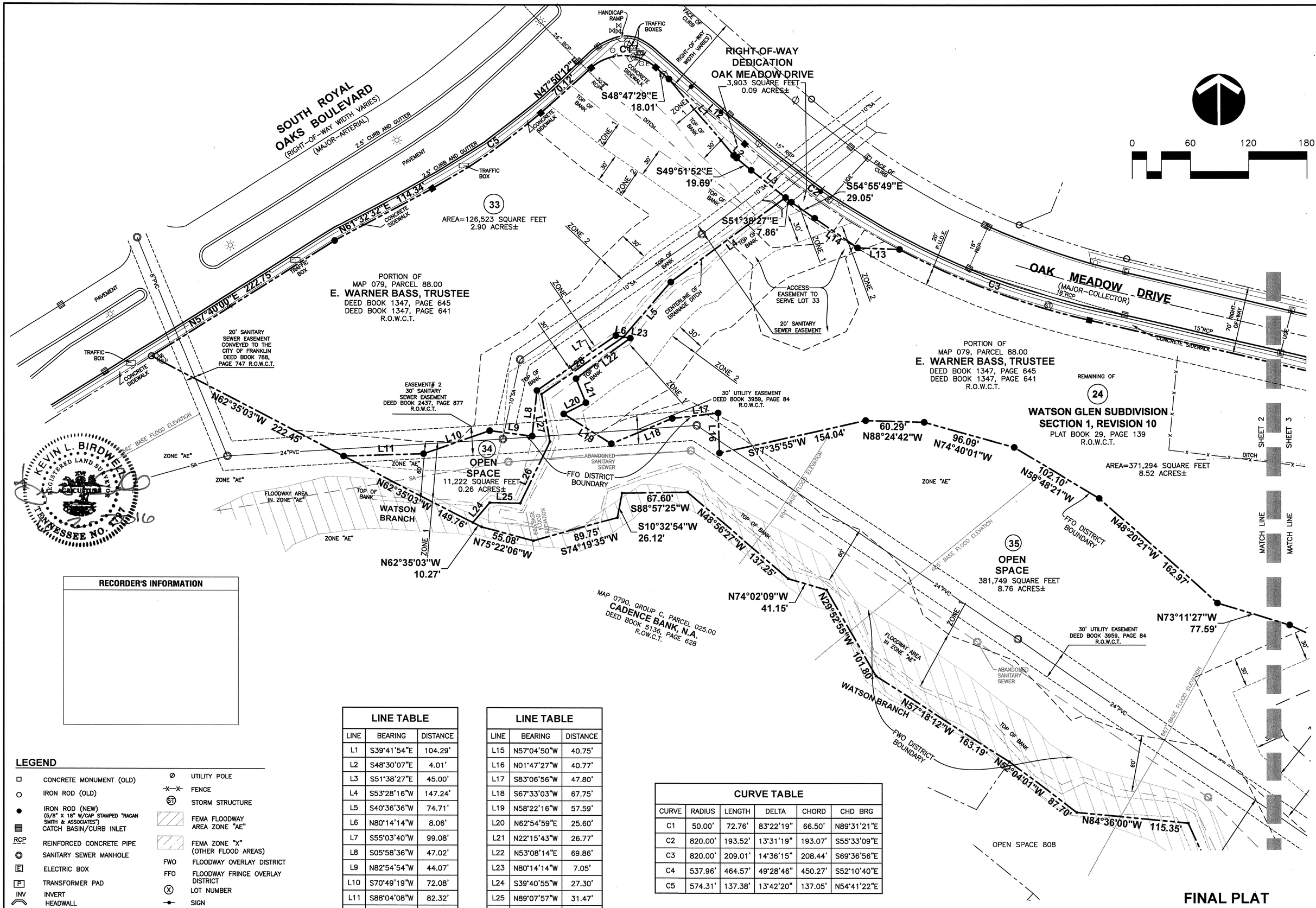
DRAWN BY: S. NAVE
JOB NO: 14034 W.O: 0338 SCALE: 1"=100'

FINAL SUBDIVISION PLAT
CITY OF FRANKLIN
WILLIAMSON COUNTY, TENNESSEE

NET AREA: 20.53 TOTAL LOTS: 2
ACRES NEW ROAD: N/A CIVIL DISTRICT: 9th
MILES NEW ROAD: N/A CLOSURE ERROR: 1:15000+

OWNER: E. WARNER BASS, TRUSTEE
SURVEYOR: RAGAN – SMITH – ASSOCIATES, INC.
SCALE: 1"=100' 0 50' 100' 200'

G:\14034-0338\1-SURVEY\PLAT\14034-0338 FINAL PLAT_WATSON GLEN.DWG SHEET 1 OF 1



KEVIN L. BIRDWELL
REGISTERED LAND SURVEYOR
TENNESSEE NO. 2116

RECORDER'S INFORMATION

LEGEND

- CONCRETE MONUMENT (OLD)
- IRON ROD (OLD)
- IRON ROD (NEW) (5/8" X 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")
- CATCH BASIN/CURB INLET
- RCP — REINFORCED CONCRETE PIPE
- SANITARY SEWER MANHOLE
- E — ELECTRIC BOX
- P — TRANSFORMER PAD
- INV — INVERT
- HEADWALL
- FIRE HYDRANT
- FO — FIBER OPTIC BOX
- –UGE– — UNDERGROUND ELECTRIC LINE
- UTILITY POLE
- –X–X– — FENCE
- ST — STORM STRUCTURE
- FEMA FLOODWAY AREA ZONE "AE"
- FEMA ZONE "X" (OTHER FLOOD AREAS)
- FWO — FLOODWAY OVERLAY DISTRICT
- FFO — FLOODWAY FRINGE OVERLAY DISTRICT
- X — LOT NUMBER
- SIGN
- WATER VALVE
- LIGHT STANDARD
- ELECTRIC STUBOUT
- R.O.W.C.T. — REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN

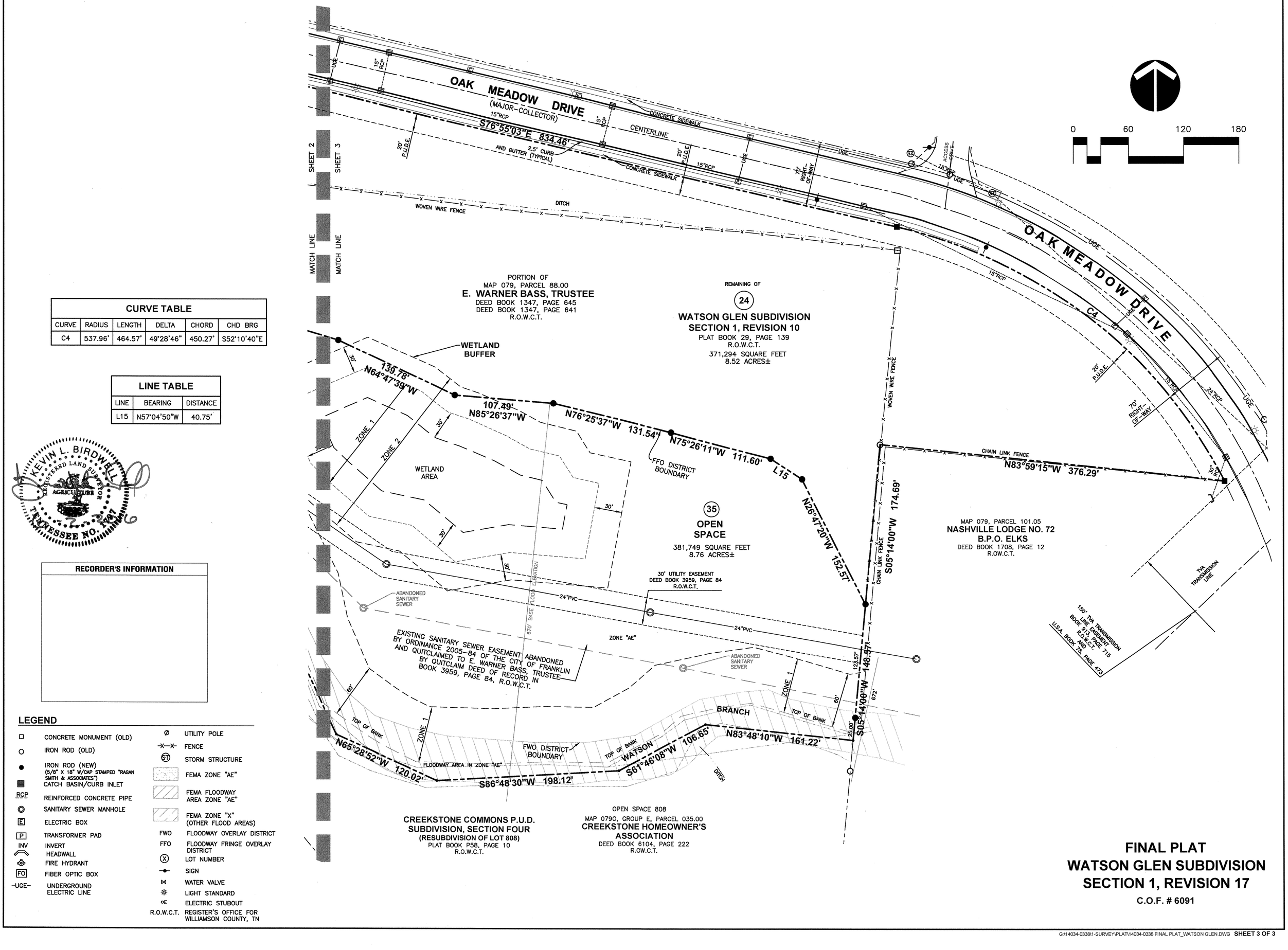
LINE TABLE		
LINE	BEARING	DISTANCE
L1	S39°41'54"E	104.29'
L2	S48°30'07"E	4.01'
L3	S51°38'27"E	45.00'
L4	S53°28'16"W	147.24'
L5	S40°36'36"W	74.71'
L6	N80°14'14"W	8.06'
L7	S55°03'40"W	99.08'
L8	S05°58'36"W	47.02'
L9	N82°54'54"W	44.07'
L10	S70°49'19"W	72.08'
L11	S88°04'08"W	82.32'
L12	S48°47'29"E	103.81'
L13	S87°53'41"E	43.21'
L14	S55°02'34"E	53.98'

LINE TABLE		
LINE	BEARING	DISTANCE
L15	N57°04'50"W	40.75'
L16	N01°47'27"W	40.77'
L17	S83°06'56"W	47.80'
L18	S67°33'03"W	67.75'
L19	N58°22'16"W	57.59'
L20	N62°54'59"E	25.60'
L21	N22°15'43"W	26.77'
L22	N53°08'14"E	69.86'
L23	N80°14'14"W	7.05'
L24	S39°40'55"W	27.30'
L25	N89°07'57"W	31.47'
L26	S25°32'12"W	70.78'
L27	S10°00'40"E	49.37'
L28	S54°59'41"W	103.02'

CURVE TABLE					
CURVE	RADIUS	LENGTH	DELTA	CHORD	CHD BRG
C1	50.00'	72.76'	83°22'19"	66.50'	N89°31'21"E
C2	820.00'	193.52'	13°31'19"	193.07'	S55°33'09"E
C3	820.00'	209.01'	14°36'15"	208.44'	S69°36'56"E
C4	537.96'	464.57'	49°28'46"	450.27'	S52°10'40"E
C5	574.31'	137.38'	13°42'20"	137.05'	N54°41'22"E

FINAL PLAT
WATSON GLEN SUBDIVISION
SECTION 1, REVISION 17

C.O.F. # 6091



CURVE TABLE					
CURVE	RADIUS	LENGTH	DELTA	CHORD	CHD BRG
C4	537.96'	464.57'	49°28'46"	450.27'	S52°10'40"E

LINE TABLE		
LINE	BEARING	DISTANCE
L15	N57°04'50"W	40.75'

KEVIN L. BIRDWELL
REGISTERED LAND SURVEYOR
AGRICULTURE
TENNESSEE NO. 2197

RECORDER'S INFORMATION

LEGEND

- CONCRETE MONUMENT (OLD)
- IRON ROD (OLD)
- IRON ROD (NEW) (5/8" X 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")
- CATCH BASIN/CURB INLET
- RCP REINFORCED CONCRETE PIPE
- SANITARY SEWER MANHOLE
- E ELECTRIC BOX
- P TRANSFORMER PAD
- INV INVERT
- HEADWALL
- FIRE HYDRANT
- FO FIBER OPTIC BOX
- -UGE- UNDERGROUND ELECTRIC LINE
- UTILITY POLE
- -X-X- FENCE
- ST STORM STRUCTURE
- FEMA ZONE "AE"
- FEMA FLOODWAY AREA ZONE "AE"
- FEMA ZONE "X" (OTHER FLOOD AREAS)
- FWO FLOODWAY OVERLAY DISTRICT
- FFO FLOODWAY FRINGE OVERLAY DISTRICT
- X LOT NUMBER
- SIGN
- WATER VALVE
- LIGHT STANDARD
- oE ELECTRIC STUBOUT
- R.O.W.C.T. REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN

FINAL PLAT
WATSON GLEN SUBDIVISION
SECTION 1, REVISION 17

C.O.F. # 6091

COF no: 6091

CONDITIONS OF APPROVAL:

Zoning

COF PROJ 6091 WATSON GLEN SEC 1 REV 17 2016-05-09.pdf

1. FFO

- The Floodway Fringe Overlay (FFO) is an overlay zoning district. This zoning district line matches the FEMA 100 year flood plain line. The property line that is shown between Lots 24 and 35 does not correspond with the zoning district line. Please show and label the existing FFO boundary.

2. FFO

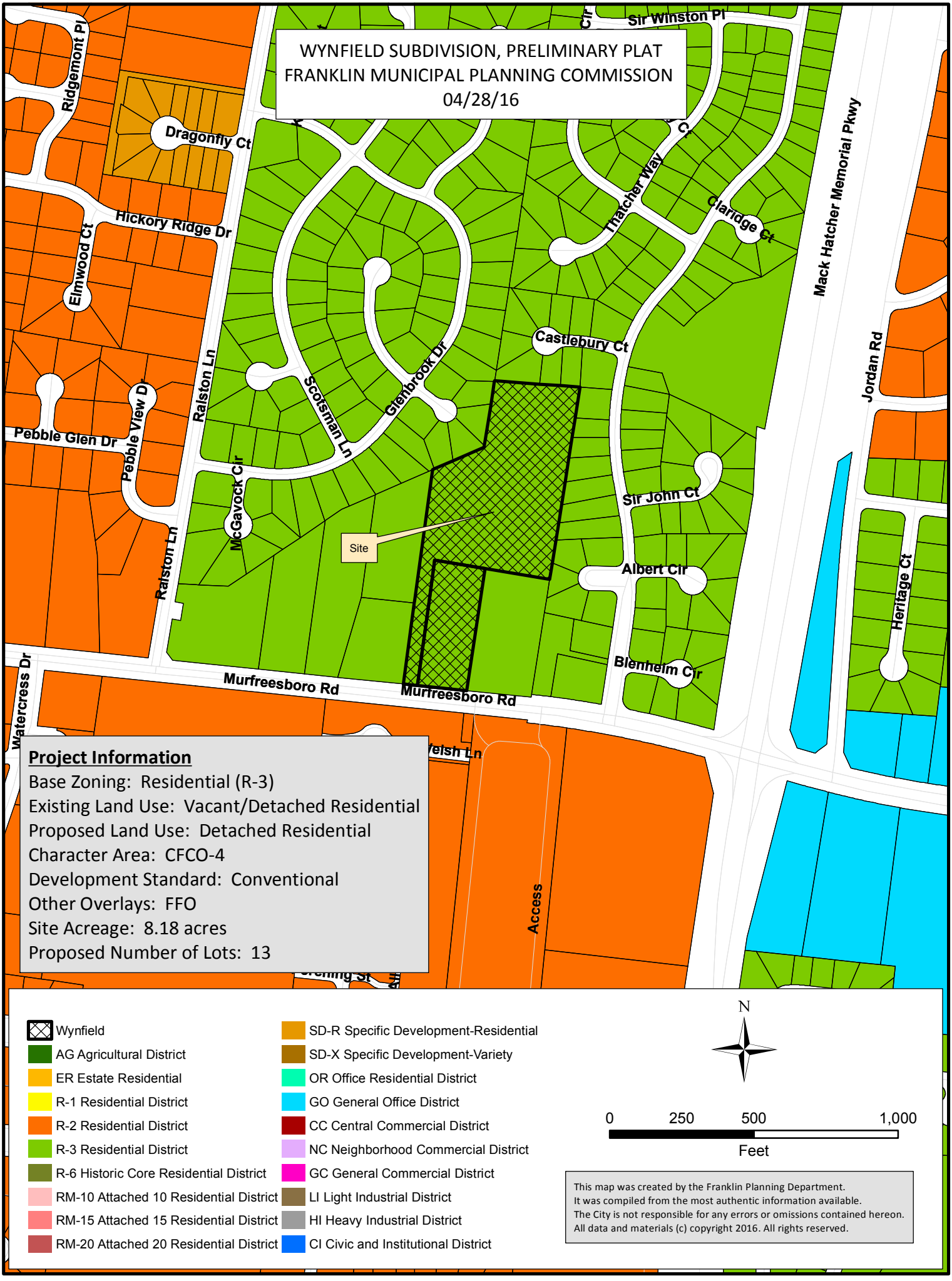
- This issue has not been addressed. Please show and label the existing FFO. This line is not the line that is shown and labeled as the property line and FFO. The FFO line is a very undulating, meandering line. The line shown on the plat is not undulating or meandering so it is clear that the line shown is not the FFO.

3. Property Line

- This issue has not been fully addressed. Since the actual FFO is not shown on the plat, it is not clear that Lot 35 contains all of the flood plain. No new buildable lots can be created that contain flood plain. Please clearly show that Lot 24 does not contain flood plain.

4. FFO

- It is not clear that this issue has been addressed. Please show the existing FFO so it is clear that no FFO is located on a buildable lot.


WYNFIELD SUBDIVISION, PRELIMINARY PLAT
FRANKLIN MUNICIPAL PLANNING COMMISSION
04/28/16
Ridgemont Pl
Dragonfly Ct
Hickory Ridge Dr
Elmwood Ct
Pebble Glen Dr
Pebble View Dr
Ralston Ln
Ralston Ln
McGavock Cir
Scotsman Ln
Glenbrook Dr
Sir Winston Pl
Thatcher Way
Claridge Ct
Mack Hatcher Memorial Pkwy
Castlebury Ct
Jordan Rd
Sir John Ct
Albert Cir
Heritage Ct
Blenheim Cir
Site
Murfreesboro Rd
Murfreesboro Rd
Watercress Dr
Welsh Ln
Access
Project Information
Base Zoning: Residential (R-3)
Existing Land Use: Vacant/Detached Residential
Proposed Land Use: Detached Residential
Character Area: CFCO-4
Development Standard: Conventional
Other Overlays: FFO
Site Acreage: 8.18 acres
Proposed Number of Lots: 13
Wynfield
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
250
500
1,000
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
All data and materials (c) copyright 2016. All rights reserved.

COF no: 6092

CONDITIONS OF APPROVAL:

Fire-Planning

Wyn Set 2.15.2016.pdf

1. Fire Protection

- The original comment from 2/18/2016 has not been addressed. On 4/6/16, the applicant responded that "a fire flow test is being scheduled..."

The applicant shall provide the the results a full fire demand flow test (two hydrant).

The flow test must be performed within six (6) months of submittal date to be considered valid. Seasonal fluctuations should be discussed with the appropriate water utility based on the project's address/location.

Fire flow requirements in the International Fire Code shall be met as a minimum or fire sprinklers shall be provided if not otherwise required.

Based on the results of the fire flow test, additional comments/requirements may be applied but cannot be provided until such results are available from the applicant.

Planning (Landscape)

General Comments

2. Detached Residential Lot Tree Chart

- This chart shall be added to the PP an FP

Stormwater

General Comments

3. Stream Buffer

- This will have to be addressed before development plan approval

4. Stream Buffer

- This will have to be addressed before development plan approval

Water/Sewer

General Comments

5. Water

- Applicant did not fully address comment, a note that reads the applicant will loop the waterline for a secondary connection shall be added to the preliminary plat. If at site plan it is determined that a secondary connection cannot be completed, Water Management will allow the dead end waterline to serve the development.

Wynfield Village Preliminary Plat

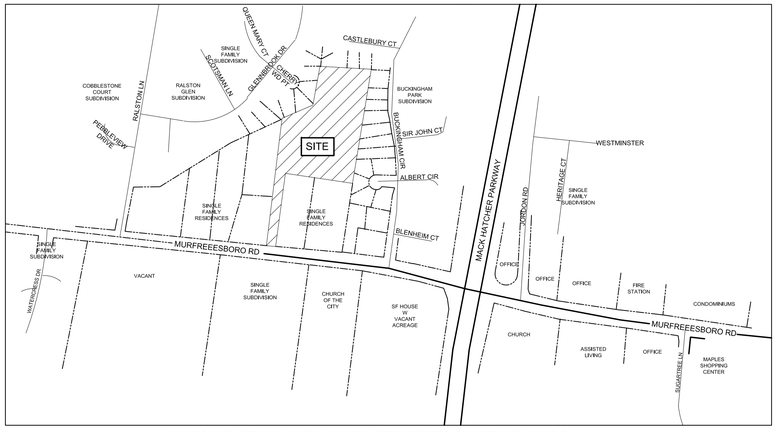
NAYLOR SUBDIVISION, REVISION 3, RESUBDIVISION OF LOTS 2 & 3
DEVELOPMENT OF NEW SUBDIVISION
WYNFIELD VILLAGE COURT off MURFREESBORO ROAD
Map 79 Parcel 6.02 8.18 ACRES
FRANKLIN, TN

OWNER / APPLICANT:
SARAH NAYLOR CHERRY & SUSAN NAYLOR MOORE CHERRY
821 MURFREESBORO ROAD
FRANKLIN, TN 37064

DEVELOPER & HOME DESIGN:
BARLOW BUILDERS
JORDON CLARK
1804 WILLIAMSON COURT
SUITE 107
BRENTWOOD TN 37027
615.533.0884

CONSULTANT:
GAMBLE DESIGN COLLABORATIVE
GREG GAMBLE, RLA
144 SOUTHEAST PARKWAY
SUITE 230
FRANKLIN TN 37064
615.975.5765
greggamble209@gmail.com

CIVIL ENGINEER / SURVEYOR:
ENERGY LAND & INFRASTRUCTURE
MICHAEL RAY, PE
MIKE DIAL, RLS
1420 DONELSON PIKE, SUITE A-12
NASHVILLE, TN 37217
615.383.6300
michael.ray@eli-llc.com



VICININTY MAP AND STREETS WITHIN 500'

N

SCALE: 1"=500 FT
0 500

INDEX OF SHEETS

SHEET	DESCRIPTION
C0.0	COVER SHEET
C1.0	EXISTING CONDITIONS/TREE PRESERVATIONPLAN
C1.1	EXISTING CONDITIONS (WITHIN 500')
C2.0	PRELIMINARY PLAT
C3.0	(EMPTY)
C4.0	ROW & ACCESS PLAN

14TH CIVIL DISTRICT OF WILLIAMSON COUNTY
CITY OF FRANKLIN, TENNESSEE

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE
PROJECT NO. 14____
greggamble209@gmail.com
615-975-5765

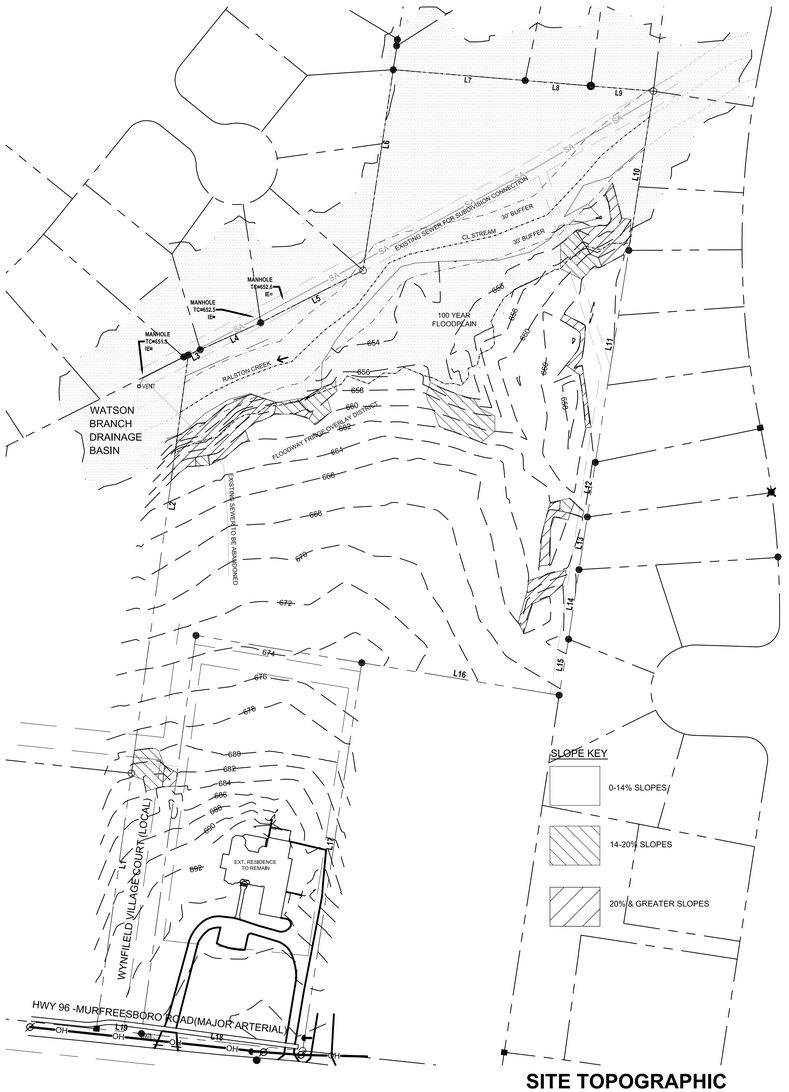
GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT

MARCH 14, 2016
APRIL 7, 2016

COF 6092

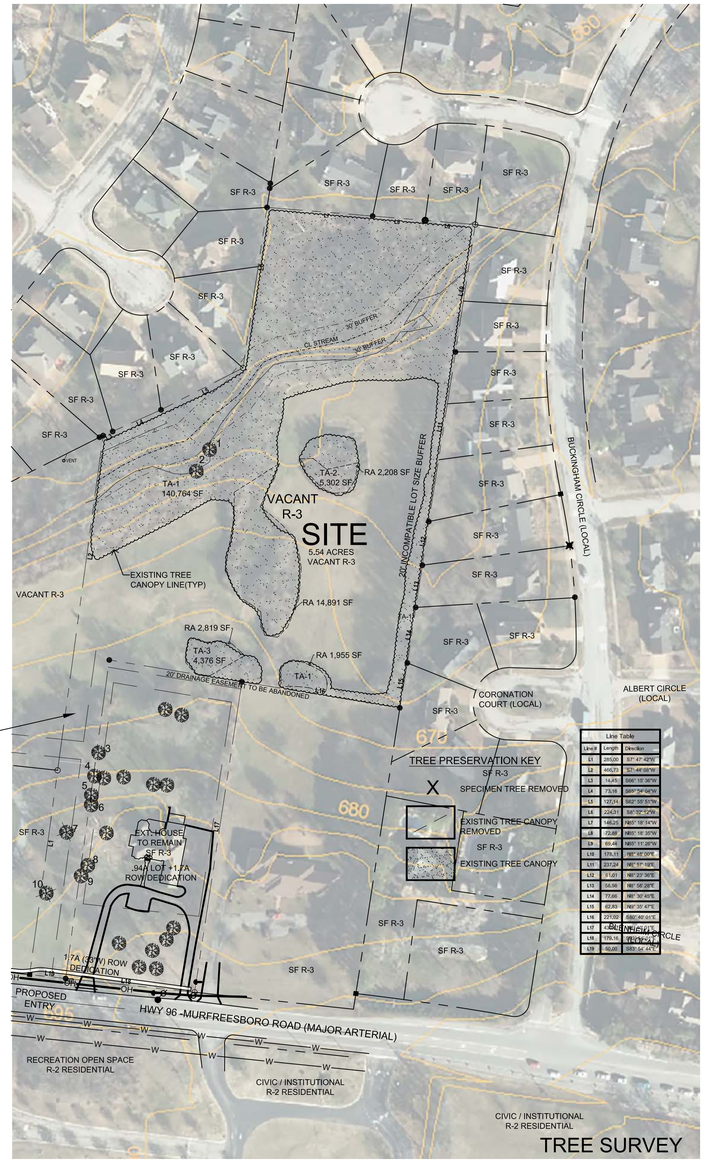
SCALE: 1"=500 FT
0 500

PLANNED ROADWAY NETWORK WITHIN 1,500 OF SITE & VICINITY MAP



SITE TOPOGRAPHIC MAP WITH 2' INTERVALS

NOTE:
TREE ROW ALONG FUTURE ENTRY SHALL BE FENCED TO DRIPLINE FOR PROTECTION BEFORE AND DURING CONSTRUCTION; ROADWAY SHALL BE ADJUSTED TO BEST PRESERVE TREES.



Line Table

Line #	Length	Direction
L1	265.09	S71°47'42"E
L2	466.79	S37°48'48"W
L3	14.45	S66°10'36"W
L4	73.78	S89°34'04"W
L5	157.71	S62°35'51"W
L6	230.51	S6°52'12"W
L7	185.24	N65°18'14"W
L8	73.68	N80°16'20"W
L9	91.42	N81°11'26"W
L10	174.13	N8°49'09"E
L11	231.24	N6°11'19"E
L12	31.01	N6°37'30"E
L13	26.92	N6°35'28"E
L14	77.66	N6°30'40"E
L15	67.83	N6°35'47"E
L16	27.03	S82°40'11"E
L17	4.82	N6°35'47"E
L18	175.18	S82°40'11"E
L19	40.46	S83°54'44"E

NOTES:
1. PARCEL LINES PROVIDED BY CITY OF FRANKLIN G.I.S.
2. SITE BOUNDARY PROVIDED BY CEC
3. PLANS REFERENCE THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FIPZONE4100; NAD 83 DATUM.

N
0 100 200 300
GRAPHIC SCALE 1"=100'

TREE SURVEY

SPECIMEN TREE SURVEY

NUMBER	TYPE	SIZE	HEALTH	STATUS
1	ASH	36"	GOOD	RETAIN
2	HACK	24"	GOOD	RETAIN
3	TREE	30"	GOOD	RETAIN
4	TREE	26"	GOOD	RETAIN
5	TREE-TWIN	24"	GOOD	RETAIN
6	TREE	26"	GOOD	RETAIN
7	TREE	24"	GOOD	REMOVE
8	TREE	48"	GOOD	RETAIN
9	TREE	24"	GOOD	RETAIN
10	TREE	30"	GOOD	REMOVE

TOTAL SPECIMEN TREES REMOVED: 2
TOTAL HEALTHY INCHES REMOVED: 54 INCHES
REPLACEMENT REQUIRED: 108 INCHES

REQUIRED TREE CANOPY PRESERVATION CHART

(ZONED R-3)

TOTAL SITE AREA:	241,322.4 SF (5.54 AC)	
EXISTING CANOPY AREA:	150,442.0 SF (3.45 AC)	62% OF SITE
C&I REQUIRED PRESERVATION:	45%,	67,699 SF (1.55 AC)
PROVIDED PRESERVATION:	85%,	128,569 SF (2.95 AC)

TREE CANOPY RETENTION

TA=TREE AREA RA=REMOVAL AREA

TREE AREA	EXISTING	REMOVED	RETAINED
TA -1	140,764 SF	16,846 SF	123,918 SF
TA -2	5,302 SF	2,208 SF	3,094 SF
TA -3	4,376 SF	2,819 SF	1,557 SF
TOTAL SF	150,442 SF	21,873 SF	128,569 SF
TOTAL ACRES	3.45 AC	.50 AC	2.95 AC

TREE CANOPY DATA

EXISTING TREE CANOPY; 150,442 SF
150,442 SF/241,322.4 SF = .62 (62%) OF TOTAL SITE
REQUIRED CANOPY PRESERVATION =
45% OF TOTAL CANOPY
150,442 x 45% = 67,699 SF
PROVIDED CANOPY PRESERVED =
128,569 SF (85%) OF TOTAL EXISTING CANOPY

SITE DATA:

PROJECT NAME:	WYNFIELD VILLAGE PRELIMINARY PLAT
PROJECT NUMBER:	6092
SUBDIVISION:	NAYLOR SUBDIVISION, REVISION 3, RESUBDIVISION OF LOTS 2 & 3
LOT NUMBERS:	LOTS 1-13 & LOT 14 OPEN SPACE
ADDRESS:	821 MURFREESBORO ROAD
CITY:	FRANKLIN, TN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 79, PARCELS 6.02 & 6.03, 8.18 ACRES
EXISTING ZONING:	R-3 RESIDENTIAL
CHARACTER AREA OVERLAY:	CENTRAL FRANKLIN CFCO4
LAND USE:	RESIDENTIAL
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
OTHER OVERLAYS	FLOODWAY FRINGE OVERLAY(FFO)
ACREAGE OF SITE	NEW LOT 1: .94 WYNFIELD: 7.07 MURF ROW: .17 DEDICATION TOTAL 8.18 A / 356,320.8 SF
PROPOSED GROSS DENSITY	13U / 8.18 AC
NET DENSITY	1.59U / AC
PARKLAND DEDICATION:	12U x 1,200 SF FEES IN LIEU OF WILL BE DUE AT FINAL PLAT
DRAINAGE BASIN:	WATKINS BRANCH

MINIMUM REQUIRED SETBACKS & LOT REQUIREMENTS:

FRONT YARD:	25'(LOCAL) & 80'(ARTERIAL)
SIDE YARD:	5' w/ 12' BETWEEN BUILDINGS
REAR YARD:	30'
MIN. LOT WIDTH:	60'
MIN LOT FRONTAGE:	48'
MINIMUM LOT SIZE	9,000 SF

APPLICANT :
CONTACT / ADDRESS
BARLOW BUILDERS
JORDAN CLARK
1804 WILLIAMSON COURT, SUITE 107
BRENTWOOD TN 37027
615.533.0884
jordon@barlowbuilders.com

OWNERS :
CONTACT / ADDRESS
SARAH CHERRY - LOTS 6.02 & 6.03
SUSAN MOORE - LOT 6.03
821 MURFREESBORO ROAD
FRANKLIN, TN 37064

PLANNER/LANDSCAPE ARCHITECT :
CONTACT / ADDRESS
GAMBLE DESIGN COLLABORATIVE
GREG GAMBLE
144 SOUTHEAST PARKWAY
SUITE 200
FRANKLIN, TN 37064
615.975.5765
greggamble209@gmail.com

CIVIL ENGINEER, SURVEYOR
CLAY WALLACE, PE
MICHAEL DIAL, RLS
ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A-12
NASHVILLE, TN 37217
615.383.6300
michael.dial@ell-llc.com

INCOMPATIBLE LOT SIZE BUFFER
CLASS 'C' APPLIES TO LOTS 3-6 ON PLAT
BUFFER REQUIRED IS 44' WIDTH
25% REDUCTION WITH FENCE MAKING BUFFER 33' WIDTH

EXISTING SITE FEATURES

DRAINAGE / STORMWATER
NATURAL SHEET FLOW NORTH AWAY FROM HWY 96 TO MARSH AREA AT NORTH END OF SITE WHERE WATSON BRANCH DRAINAGE BASIN IS LOCATED..

HISTORIC STRUCTURES
NONE KNOWN WITHIN 500' OF SITE

MINERAL RIGHTS
NO THIRD PARTY MINERAL RIGHTS ARE ASSOCIATED WITH THIS PROPERTY.

PLANNED DEVELOPMENT WITHIN 500'
NONE

POLICE AND FIRE DEPARTMENTS
FRANKLIN FIRE DEPT STATION MURF. RD - 1.5 MILES DRIVING DISTANCE
COLUMBIA AVE POLICE STATION - 3.8 MILES DRIVING DISTANCE

PROJECTED STUDENT POPULATION
THE STUDENT POPULATION IS PROJECTED AT A RATE OF .64 STUDENTS PER HOME: 12 x .64 = 7.68 STUDENTS

LIBERTY ELEMENTARY SCHOOL	0,9 MILES
FREEDOM MIDDLE SCHOOL	2.8MILES
CENTENNIAL HIGH SCHOOL	3,0 MILES

RECREATION FACILITIES
PINKERTON PARK - 0.9 MILES DRIVING DISTANCE
DEVELOPER WILL PAY RECREATION FEE

REFUSE COLLECTION
CITY OF FRANKLIN CURBSIDE CONTAINERS

RESTRICTIVE COVENANTS
FLOODWAY FRINGE OVERLAY DISTRICT ON NORTH PORTION;
20' LOT SIZE BUFFER ON ALL SIDES BUT WESTERN:
HOMEOWNERS COVENANTS ON ALL LOTS

SEWER
CITY OF FRANKLIN CONNECTING TO EXISTING SERVICE NORTH OF PROPERTY.

STREETS WITHIN 1500'
SEE MAP UPPER LEFT CORNER THIS PAGE.

TREE CANOPY DATA
EXISTING/PRESERVED TREE CANOPY; 150,442 SF / 128,569 SF

WATER
CITY OF FRANKLIN, 12 NEW LOTS @ 350 GPD = 4,200 GPD
FIRE HYDRANT PRESSURE TO BE DETERMINED.

ZONING DISTRICTS
SITE IS CONVENTIONAL; ADJACENT PARCELS ARE CONVENTIONAL
THE SITE AND AREAS WITHIN 500' ARE CFCO-4

COF 6092

Revisions:
April 7, 2016

Drawing Notes:

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

Date: MARCH 14, 2016

WYNFIELD VILLAGE
PRELIMINARY PLAT
Map 79 Parcel 6.02
Franklin, Williamson County, Tennessee

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
SUITE 230
FRANKLIN, TENNESSEE 37064
GREG GAMBLE
greggamble209@gmail.com
615.975.5765

EXISTING CONDITIONS PLAN

C 1.0

SCALE 1" = 100'

2' CONTOUR INTERVALS AND
ROADWAY NETWORK WITHIN 500'

COF 6092

Revisions:
April 7, 2016

Drawing Notes:

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

Date: MARCH 14, 2016

WYNFIELD VILLAGE
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Map 79 Parcel 6.02
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144 SOUTHEAST PARKWAY
SUITE 230
FRANKLIN, TENNESSEE 37064
GREG GAMBLE
greggamble209@gmail.com
615.975.5765

EXISTING
CONDITIONS
PLAN

C 1.1

TN STATE PLANE CORD., ZONE5301, FIPZONE 4100; NAD83 DATUM

GRAPHIC SCALE (IN FEET)

40 0 20 40 80

1 inch = 40 ft.

Notes:

1. The purpose of this preliminary plat is to combine two existing parcels and subdivide for creation of 14 new lots for a single family, detached development.
2. Additional land from map 79, parcel 6.01 will be added to lot 4 prior to final plat approval. otherwise lot 4 will be divided between lots 3 and 5.
3. Street light locations and quantities are approximate. final positioning and quantity shall be at the discretion of mtemc.
4. Residential fire sprinklers will be required in all new homes due to the length of the cul-de-sac.
5. There shall be no mowing, clearing, grading, construction, storage, or disturbance of vegetation in riparian buffers except as permitted by the city engineer, or his designee.

SITE DATA

PROJECT NAME:	WYNFIELD VILLAGE PRELIMINARY PLAT
PROJECT NUMBER:	6092
SUBDIVISION:	NAYLOR SUBDIVISION, REVISION 3 RESUBDIVISION OF LOTS 2 & 3
LOT NUMBERS:	LOTS 1-13 AND 14 BEING OPEN SPACE
ADDRESS:	821 MURFREESBORO ROAD
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 79, PARCELS 6.02 & 6.03
EXISTING ZONING:	R-3 RESIDENTIAL DISTRICT
CHARACTER AREA OVERLAY:	CENTRAL FRANKLIN CFCO4
LAND USE:	RESIDENTIAL
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
OTHER OVERLAYS:	FLOODWAY FRINGE OVERLAY (FFO)
ACREAGE OF SITE:	NEW LOT 1: 0.94 AC WYNFIELD: 7.07 AC MURF ROW 0.17 AC DEDICATION
TOTAL:	8.18 AC
PROPOSED GROSS DENSITY:	13U/8.18 AC
NET DENSITY:	1.59U / AC
PARKLAND DEDICATION:	12U X 1,200 SF = 14,400 SF FEES IN LIEU OF WILL BE DUE AT FINAL PLAT
DRAINAGE BASIN:	WATKINS BRANCH
MINIMUM REQUIRED SETBACK LINES & LOT REQUIREMENTS:	
FRONT:	25 FEET (LOCAL) & 80 FEET (ARTERIAL)
SIDE:	5 FEET (12 FEET BETWEEN BUILDINGS)
REAR:	30 FEET
MIN. LOT WIDTH:	60 FEET
MIN. LOT FRONTAGE:	48 FEET
MIN. LOT SIZE:	9,000 SF
OWNERS:	SARAH NAYLOR CHERRY & SUSAN NAYLOR MOORE CHERRY
ADDRESS:	821 MURFREESBORO ROAD FRANKLIN, TN 37064
APPLICANT:	BARLOW BUILDERS
ADDRESS:	1804 WILLIAMSON COURT, SUITE 107 BRENTWOOD, TN 37027
PHONE NUMBER:	(615) 533-0884
CONTACT NAME:	JORDAN CLARK
PLANNER:	GAMBLE DESIGN COLLECTIVE
ADDRESS:	144 SOUTHEAST PARKWAY, SUITE 200 FRANKLIN, TN 37064
PHONE NUMBER:	(615) 975-5765
CONTACT NAMES:	GREG GAMBLE
ENGINEER / LAND SURVEYOR:	ENERGY LAND & INFRASTRUCTURE
ADDRESS:	1420 DONELSON PIKE, SUITE A12 NASHVILLE, TN 37217
PHONE NUMBER:	(615) 383-6300
CONTACT NAMES:	CLAY WALLACE (ENGINEER) MIKE DIAL (SURVEYOR)

BUCKINGHAM CIRCLE
40' RO.W. (LOCAL)

CORONATION COURT
100' RO.W. (LOCAL)

SCALED FFO / 100 YR FLOODPLAIN PER PRELIMINARY FEMA FIRM COMMUNITY PANEL NO. 47187C0211G DATED SEPTEMBER 29, 2014

SANITARY SEWER EASEMENT TO BE ABANDONED

10' EXISTING SANITARY SEWER EASEMENT

20' EXISTING DRAINAGE EASEMENT

TOP OF BANK

PRELIMINARY 60' AVERAGE ZONE 2 WATER QUALITY BUFFER (30' MIN.) / 30' ZONE 1 WATER QUALITY BUFFER

STORMWATER MANAGEMENT / GREEN INFRASTRUCTURE BMP

50' EXISTING DRAINAGE EASEMENT

30' ZONE 1 WATER QUALITY BUFFER

20' DRAINAGE EASEMENT

20' SANITARY SEWER EASEMENT

WYNFIELD VILLAGE COURT
50' R.O.W. (LOCAL)

STORMWATER MANAGEMENT / GREEN INFRASTRUCTURE BMP

PRELIMINARY 60' AVERAGE ZONE 2 WATER QUALITY BUFFER (30' MIN.)

RALSTON CREEK

DRAINAGE EASEMENT TO BE ABANDONED

25' EXISTING DRAINAGE EASEMENT

EXISTING FENCE

44' CLASS "C" INCOMPTABILE BUFFER DUE TO ADJACENT LOT SIZE REDUCED TO 33' (25%) WITH PROPOSED FENCE

44' CLASS "C" INCOMPTABILE BUFFER DUE TO ADJACENT LOT SIZE REDUCED TO 33' (25%) WITH PROPOSED FENCE

484' FROM EXISTING STREET INTERSECTION TO NEAREST LOT LINE

FUTURE COF SIDEWALK

32' R.O.W. DEDICATION

MURFREESBORO ROAD / SR 96
66' RO.W. (MAJOR ARTERIAL)

PROPOSED LOT 1 DRIVEWAY CONNECTION

EXISTING LOT 1 DRIVEWAY CONNECTION TO BE ABANDONED

SANITARY SEWER SERVICE TO BE ABANDONED

SCALED FFO / 100 YR FLOODPLAIN PER PRELIMINARY FEMA FIRM COMMUNITY PANEL NO. 47187C0211G DATED SEPTEMBER 29, 2014

BOUNDARY LINE TAG (TYP)

GLENBROOK DRIVE
40' RO.W. (LOCAL)

LEE GORDON O
LEE MINA J
MAP 079H-F, PARCEL 12
DB 871, PG 160
R.O.W.C., TN

WILLIAMS PAUL E
WILLIAMS CHRISTINE M
MAP 079H-F, PARCEL 11
DB 1174, PG 691
R.O.W.C., TN

CARRINGER DENISE FOLSOM
CARRINGER THOMAS
MAP 079H-F, PARCEL 10
DB 5120, PG 924
R.O.W.C., TN

SWADE KELTON JUDAH
MAP 079H-F, PARCEL 9
DB 2177, PG 15
R.O.W.C., TN

STEWART KELLY
MAP 079H-F, PARCEL 8
DB 6237, PG 380
R.O.W.C., TN

WOLFF JAMES A
WOLFF ANNL
MAP 079H-F, PARCEL 7
DB 1123, PG 440
R.O.W.C., TN

MAHONEY GREGORY L
MAHONEY GLENDA D
MAP 079H-F, PARCEL 6
DB 1551, PG 790
R.O.W.C., TN

BROWN THOMAS E
BROWN DENISE K
MAP 079H-F, PARCEL 4
DB 2019, PG 391
R.O.W.C., TN

JOHNSON MICHAEL D
JOHNSON CAIL WALLIN
MAP 079H-F, PARCEL 3
DB 4773, PG 227
R.O.W.C., TN

WYNNE EDWARD IAN
WYNNE MEGHANN D
MAP 079H-F, PARCEL 13
DB 5753, PG 962
R.O.W.C., TN

COON EDWARD J
COON BARBARA W
MAP 079H-F, PARCEL 14
DB 823, PG 899
R.O.W.C., TN

STRICKLAND MICHAEL D
STRICKLAND MARTHA F
MAP 079H-F, PARCEL 15
DB 1502, PG 539
R.O.W.C., TN

FRY RICKY D TR
FRY SUE S TR
MAP 079H-F, PARCEL 16
DB 5100, PG 523
R.O.W.C., TN

CANARY SARAH KAYLOR
CHERRY SUSAN NAYLOR MOORE
MAP 079, PARCEL 6.02
DB 3498, PG 948
R.O.W.C., TN

MOORE SUSAN NAYLOR
MAP 079, PARCEL 6.03
DB 1413, PG 481
R.O.W.C., TN

BENTLEY GEORGE RAY
BENTLEY JEAN
MAP 079, PARCEL 6.01
DB 1158, PG 242
R.O.W.C., TN

SWAIN AVALYN BERRY
SWAIN TIMOTHY W II
MAP 079, PARCEL 6.07
DB 3509, PG 973
R.O.W.C., TN

SWAIN AVALYN BERRY
SWAIN TIMOTHY W II
MAP 079, PARCEL 6
DB 3509, PG 949
R.O.W.C., TN

MILLER MARK H
MILLER TARIN H
MAP 079H-G, PARCEL 19
DB 3099, PG 122
R.O.W.C., TN

STALEY MELISSA D
MAP 079H-G, PARCEL 18
DB 5654, PG 649
R.O.W.C., TN

BOUCHEY JAMES P
BOUCHEY JEAN M
MAP 079H-G, PARCEL 21
DB 1032, PG 734
R.O.W.C., TN

BLALACK KATHY B REV LIV TRUST
MAP 079H-G, PARCEL 17
DB 6007, PG 572
R.O.W.C., TN

SHEPHERD TRAVIS J
SHEPHERD STEPHANIE DIANE
MAP 079H-G, PARCEL 16
DB 5271, PG 946
R.O.W.C., TN

TABSCOTT CHRIS
TABSCOTT DENISE M
MAP 079H-G, PARCEL 14
DB 3992, PG 985
R.O.W.C., TN

Boundary Line Table

Line #	Length	Direction
L1	285.00	S7° 47' 42"W
L2	466.73	S7° 44' 08"W
L3	14.45	S66° 15' 36"W
L4	73.16	S65° 54' 04"W
L5	127.14	S62° 55' 51"W
L6	224.31	S8° 32' 12"W
L7	146.25	N85° 18' 14"W
L8	72.88	N85° 18' 35"W
L9	69.44	N85° 11' 26"W
L10	178.11	N8° 48' 00"E
L11	237.24	N8° 57' 19"E
L12	61.01	N8° 23' 36"E
L13	58.98	N8° 58' 28"E
L14	77.66	N8° 30' 45"E
L15	62.83	N9° 35' 47"E
L16	221.02	S80° 40' 01"E
L17	433.87	N8° 40' 01"E
L18	179.16	S83° 54' 01"E
L19	50.00	S83° 54' 44"E

Lot Table

Lot #	Square Feet	Acres
1	40,787	0.94
2	9,005	0.21
3	11,199	0.26
4	9,726	0.22
5	9,987	0.23
6	12,468	0.29
7	9,007	0.21
8	9,001	0.21
9	9,893	0.23
10	9,530	0.22
11	9,100	0.21
12	9,100	0.21
13	11,620	0.27

Open Space Table

Lot #	Square Feet	Acres
14	137,629	3.16

ROW Table

Lot #	Square Feet	Acres
ROW	58,353	1.34

Legend

- Fire Hydrant
- W — Water Line
- S — Sewer Line
- (S) Sewer Manhole
- Street Light
- Proposed Stormwater Inlet
- Concrete Sidewalk
- (1) Lot Number

Property Description (Wynfield Village)

Being a parcel of land located in the 9th Civil District of Williamson County, Tennessee, being lands of Sarah and Susan Naylor described in Deed Book 3498 Page 45, Tax Map 79 Parcel 6.02 and lands of Susan Moore described in Deed Book 1413 Page 481, Tax Map 79 Parcel 6.03, and being more particularly described as follows:

Beginning at a concrete monument found along the north margin of Mufreesboro Road (State Highway 96- 66' ROW), and being the southeast corner of Avalyn Berry and Timothy W Swain (DB 3509 Page 949);Thence along the East line of Swain, N 07 Deg 47 Min 42 Sec E a distance of 285.00' to the northeast corner of Swain, and the southeast corner of Swain (DB 3509 Page 973);Thence with the East line of Swain, N 07 Deg 44 Min 08 Sec E a distance of 466.73' to a ½" iron rod found, the northeast corner of Swain and being the South line of Chris and Denise Tabscott (DB 5992 Page 983);Thence along the South line of Tabscott, N 66 Deg 15 Min 36 Sec E a distance of 14.45' to a ½" iron rod found, being the southwest corner of Travis and Stephanie Shepherd (DB 5271 Page 946);Thence along the South line of Shepherd, N 65 Deg 54 Min 04 Sec E a distance of 73.16' to a ½" iron rod found, being the southwest corner of Kathy B Blalack Revocable Living Trust (DB 6007 Page 572);Thence along the South line of Blalack, N 62 Deg 55 Min 51 Sec E a distance of 127.14' to the southwest corner of Melissa D Staley (DB 5654 Page 649);Thence along the East line of Staley and Benjamin and Jessica Maxwell (DB 6517 Page 562), N 08 Deg 32 Min 12 Sec E a distance of 224.31' to a ½" iron rod, being the southwest corner of Ricky and Sue Fry (DB 5100 Page 523);Thence along the South line of Fry, S 85 Deg 18 Min 14 Sec E a distance of 146.25' to a ½" iron rod found, the southwest corner of Michael and Martha Strickland (DB 1502 Page 539);Thence along the South line of Strickland, S 85 Deg 18 Min 35 Sec E a distance of 72.88' to an iron rod found, the southwest corner of Edward and Barbara Coon (DB 823 Page 599);Thence along the South line of Coon, S 85 Deg 11 Min 26 Sec E a distance of 69.44' to the southeast corner of Coon and the north west corner of Gordon and Mina Lee (DB 871 Page 160);Thence along the West line of Lee, S 08 Deg 48 Min 00 Sec W a distance of 178.11' to a ½" iron rod found, the southwest corner of Paul and Christine Williams (DB 1174 Page 691) and the northwest corner of Denise Carringer (DB 5120 Page 924);Thence along the West line of Carringer, Kelton Swade (DB 2177 Page 15) and Kelly Stewart (DB 6237 Page 380), S 08 Deg 57 Min 19 Sec W a distance of 237.24' to a ½" iron rod found, the southwest corner of Stewart and the northwest corner of James Wolff (DB 1123 Page 440);Thence along the West line of Wolff, S 08 Deg 23 Min 36 Sec W a distance of 61.01' to a ½" iron rod found, being the southwest corner of Wolff and the northwest corner of Gregory and Glenda Mahoney (DB 1551 Page 790);Thence along the West line of Mahoney, S 08 Deg 58 Min 28 Sec W a distance of 58.98' to an iron rod found, being the southwest corner of Mahoney and the northwest corner of Thomas and Denise Brown (DB 2019 Page 391);Thence along the West line of Brown, S 08 Deg 30 Min 45 Sec W a distance of 77.66' to an iron rod found, being the southwest corner of Brown and the northwest corner of Michael and Gail Johnson (DB 4773 Page 227);Thence along the West line of Johnson, S 09 Deg 35 Min 47 Sec W a distance of 62.83' to a 5/8" iron rod, being the northwest corner of George and Jean Bentley (DB 1158 Page 242);Thence along the North line of Bentley, N 80 Deg 40 Min 01 Sec W a distance of 221.02' to an iron rod set, being the northwest corner of Bentley;Thence along the West line of Bentley, S 08 Deg 40 Min 01 Sec W a distance of 433.87' to the northern margin of Murfreesboro Road (State Route 96- 66' ROW);Thence along the northern margin of Murfreesboro Road (State Route 96) N 83 Deg 54 Min 01 Sec W a distance of 179.16' to an iron rod found;Thence continuing along the northern margin of Murfreesboro Road (State Route 96) N 83 Deg 54 Min 44 Sec W a distance of 50.00' to the point of beginning, having an area of 356,404.98 square feet, 8.18 acres, according to a survey by Energy, Land, and Infrastructure on April 16, 2015.

GDC
GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A12 • NASHVILLE, TN 37217
OFFICE: 615.383.6300 • WWW.ELI-LLC.COM
ENGINEERS • SURVEYORS • INFRASTRUCTURE • ENVIRONMENTAL

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WYNFIELD VILLAGE
PRELIMINARY PLAT
NAYLOR SUBDIVISION, REVISION 3,
RESUBDIVISION OF LOTS 2 AND 3
CITY OF FRANKLIN, TENNESSEE
FRANKLIN PROJECT NO. 6092

Rev.	Date	Revision Description
1	4/7/16	City of Franklin Comments

ARTHUR M. DIAL — 2417 — LICENSED PROFESSIONAL LAND SURVEYOR — STATE OF TENNESSEE — 4/7/16

Issue Date:	3/14/16
ELI Project No:	16-11-1101
Drafted By:	LCW
Checked By:	VWB

Sheet Title:

PRELIMINARY PLAT

Sheet No.

C2.0

Filename: W:\16-11-1101 Wynfield Village\CAD\Production Drawings\Preliminary Plat\C2.0 PRELIMINARY PLAT.dwg
Layout: C2.0 PRELIMINARY PLAT
Plotted: Thursday, April 07, 2016 - 9:48 am
By: clayw

TN STATE PLANE CORD., ZONE5301, FIPZONE 4100; NAD83 DATUM

GRAPHIC SCALE (IN FEET)

40 0 20 40 80

1 inch = 40 ft.

CITY OF FRANKLIN TOWER 2 (SUTPHEN SP 100 AERIAL PLATFORM)

LENGTH 51.25 FT
FROM BUMPER TO CENTERLINE OF FRONT AXLE 10 FT
WHEELBASE (FRONT AXLE TO REAR AXLE) 22.25 FT
WIDTH 8.66 FT
TRACK 8.00 FT
LOCK TO LOCK TIME 6 SECONDS
STEERING LOCK ANGLE 42°
APPROACH ANGLE 13°
DEPARTURE ANGLE 8°
TURNING RADIUS (INSIDE) 22 FT
TURNING RADIUS (OUTSIDE) 36 FT 7 IN
TURNING RADIUS (WALL TO WALL) 42 FT
GROSS VEHICLE WEIGHT 67,000 LBS

R.O.W. & ACCESS GENERAL NOTES

1. PRIOR TO BEGINNING ANY CONSTRUCTION, THE DEVELOPER AND/OR CONTRACTOR, SHALL OBTAIN ALL NECESSARY PERMITS AS REQUIRED BY LAW. SUCH PERMITS MAY INCLUDE, BUT ARE NOT LIMITED TO, THOSE REQUIRED BY STATE OF TENNESSEE WILLIAMSON COUNTY AND OTHER CITY OF FRANKLIN AGENCIES.
2. ALL OFF-SITE WORK WITHIN THE PUBLIC RIGHT-OFWAY SHALL REQUIRE AN APPROVED TRAFFIC CONTROL PLAN WHICH COMPLIES WITH THE MUTCD. NO OFF-SITE EXCAVATION MAY BE UNDERTAKEN IN ANY STREET, ROAD, ALLEY OR RIGHT-OF-WAY OF ANY UTILITY OR TEMPORARY CONSTRUCTION EASEMENT OF THE CITY OF FRANKLIN BY ANY ENTITY UNLESS 72-HOUR NOTICE HAS BEEN GIVEN TO THE CITY OF FRANKLIN TRAFFIC OPERATIONS CENTER. THE CONTRACTOR SHALL HAVE AN APPROVED TRAFFIC CONTROL PLAN ONSITE DURING CONSTRUCTION.
3. CONSTRUCTION MATERIALS SHALL BE FULLY TESTED IN ACCORDANCE WITH THE DESIGNATIONS AND REQUIREMENTS WITHIN THE REFERENCED "TDOT STANDARD SPECIFICATIONS" SECTIONS, UNLESS OTHERWISE NOTED WITHIN THE "STANDARD SPECIFICATIONS" SECTION OF THE CITY OF FRANKLIN TRANSPORTATION & STREET TECHNICAL STANDARDS.
4. AN AUTHORIZED REPRESENTATIVE OF THE CITY SHALL MAKE A FINAL INSPECTION OF THE PROJECT AFTER COMPLETION TO DETERMINE ACCEPTABILITY OF THE WORK AND FOR RELEASE OF PERFORMANCE BONDS IF REQUIRED. BEFORE THIS FINAL INSPECTION CAN BE MADE, THE ENGINEER RESPONSIBLE FOR THE PROJECT SHALL CERTIFY IN WRITING TO THE CITY ENGINEER THAT THE WORK HAS BEEN COMPLETED IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS.
5. LOCATING AND COORDINATION FOR THE RELOCATION OF EXISTING UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR, TENNESSEE'S ONE-CALL AND THE CITY OF FRANKLIN UTILITY LOCATION SERVICE SHALL BE UTILIZED IN ADDITION TO COORDINATION WITH LOCAL UTILITY OWNERS. THE CONTRACTOR SHALL AT ALL TIMES PROTECT EXISTING UTILITIES AND WILL BE RESPONSIBLE FOR COSTS DUE TO DAMAGE CAUSED TO ANY UTILITY LINES.
6. ALL TEMPORARY STRIPING SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," PUBLISHED BY TDOT. THE LATEST REVISION EXCEPT AS HEREIN AMENDED. WHEN APPROVED, TEMPORARY STRIPING SHALL BE REQUIRED PRIOR TO THE OPENING OF A STREET FOR TRAVEL WHERE PAVEMENT AND/OR PERMANENT STRIPING CANNOT BE COMPLETED DUE TO WEATHER AND/OR TIME CONSTRAINTS.
7. THERMOPLASTIC PAVEMENT MARKINGS SHOULD BE USED ON ALL PUBLIC AND PRIVATE CITY STREET PROJECTS. THERMOPLASTIC TRAFFIC STRIPING AND PAVEMENT MARKINGS SHALL CONFORM TO SECTION 716.03 "THERMOPLASTIC PAVEMENT MARKINGS", OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS (TDOT), AND TO THE CITY OF FRANKLIN TRANSPORTATION & STREET TECHNICAL STANDARDS.

BUCKINGHAM CIRCLE
40' RO.W. (LOCAL)

CORONATION COURT
100' RO.W. (LOCAL)

LEE GORDON O
LEE MINA J
MAP 079H-F, PARCEL 12
DB 871, PG 160
R.O.W.C., TN

WILLIAMS PAUL E
WILLIAMS CHRISTINE M
MAP 079H-F, PARCEL 11
DB 1174, PG 691
R.O.W.C., TN

CARRINGER DENISE FOLSOM
CARRINGER THOMAS
MAP 079H-F, PARCEL 10

SWADE KELTON JUDAH
MAP 079H-F, PARCEL 9
DB 2177, PG 15
R.O.W.C., TN

STEWART KELLY
MAP 079H-F, PARCEL 8
DB 6237, PG 380
R.O.W.C., TN

WOLFF JAMES A
WOLFF ANNL
MAP 079H-F, PARCEL 7
DB 1123, PG 440
R.O.W.C., TN

MAHONEY GREGORY L
MAHONEY GLENDA D
MAP 079H-F, PARCEL 6
DB 1551, PG 790
R.O.W.C., TN

BROWN THOMAS E
BROWN DENISE R
MAP 079H-F, PARCEL 4
DB 2019, PG 391
R.O.W.C., TN

JOHNSON MICHAEL D
JOHNSON GAIL WALLIN
MAP 079H-F, PARCEL 3
DB 4773, PG 227
R.O.W.C., TN

WYNNE EDWARD IAN
WYNNE MEGHANN D
MAP 079H-F, PARCEL 13
DB 5753, PG 962
R.O.W.C., TN

COON EDWARD J
COON BARBARA W
MAP 079H-F, PARCEL 14
DB 823, PG 899
R.O.W.C., TN

STRICKLAND MICHAEL D
STRICKLAND MARTHA F
MAP 079H-F, PARCEL 15
DB 1502, PG 539
R.O.W.C., TN

FRY RICKY D TR
FRY SUE S TR
MAP 079H-F, PARCEL 16
DB 5100, PG 523
R.O.W.C., TN

MILLER MARK H
MILLER KARIN B
MAP 079H-G, PARCEL 19
DB 2099, PG 122
R.O.W.C., TN

STALEY MELISSA D
MAP 079H-G, PARCEL 18
DB 5654, PG 649
R.O.W.C., TN

BOUCHEY JAMES P
BOUCHEY JEAN M
MAP 079H-G, PARCEL 21
DB 1032, PG 734
R.O.W.C., TN

BLALACK KATHY B REV LIV TRUST
MAP 079H-G, PARCEL 17
DB 6007, PG 672
R.O.W.C., TN

SHEPHERD TRAVIS J
SHEPHERD STEPHANIE DIANE
MAP 079H-G, PARCEL 16
DB 5271, PG 946
R.O.W.C., TN

TABSCOTT CHRIS
TABSCOTT DENISE M
MAP 079H-G, PARCEL 14
DB 5992, PG 983
R.O.W.C., TN

BENTLEY GEORGE RAY
BENTLEY JEAN
MAP 079, PARCEL 6.01
DB 1158, PG 242
R.O.W.C., TN

MOORE SUSAN NAYLOR
MAP 079, PARCEL 6.03
DB 1413, PG 481
R.O.W.C., TN

SWAIN AVALYN BERRY
SWAIN TIMOTHY W II
MAP 079, PARCEL 6
DB 3509, PG 949
R.O.W.C., TN

L1 165'
L2 165'
L3 SEE CURVE TABLE
L4 SEE CURVE TABLE
L5 SEE CURVE TABLE
L6 SEE CURVE TABLE
L7 SEE CURVE TABLE
L8 SEE CURVE TABLE
L9 SEE CURVE TABLE
L10 SEE CURVE TABLE
L11 76'
L12 24' 61'
L13 61' 33'
L14 39' 38'
L15 63'
L16 141' 23'
L17 126' 48' 227'
L18 162'

9 8 7 6 5 4 3 2 1 10 11 12 13 14

75' 141' 126' 142' 172' 141' 23' 50' 40' 42' 24' 35' 48' 60' 90' 70' 35' 119' 132' 139' 70' 130' 70' 70' 70' 130' 70' 70' 70' 130' 70' 39' 126' 139' 146' 129' 50' 57' 57' 70' 75' 45' 60' 219' 21'

484' FROM EXISTING
STREET INTERSECTION
TO NEAREST LOT LINE

FUTURE COF
SIDEWALK

32' R.O.W. DEDICATION

PROPOSED LOT 1
DRIVEWAY CONNECTION

EXISTING LOT 1
DRIVEWAY CONNECTION
TO BE ABANDONED

WYNFIELD VILLAGE COURT
50' RO.W. (LOCAL)

MURFREESBORO ROAD / SR 96
66' RO.W. (MAJOR ARTERIAL)

RALSTON CREEK

GLENBROOK DRIVE
40' RO.W. (LOCAL)

SA SANITARY SEWER EASEMENT

R.O.W.C., TN

Legend

- Fire Hydrant
- W — Water Line
- S — Sewer Line
- (S) Sewer Manhole
- Street Light
- Proposed Stormwater Inlet
- Concrete Sidewalk
- (1) Lot Number

GDC
GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A12 • NASHVILLE, TN 37217
OFFICE: 615.333.0325 • WWW.ELI-LLC.COM
ENGINEERS • SURVEYORS • INFRASTRUCTURE • ENVIRONMENTAL

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WYNFIELD VILLAGE
PRELIMINARY PLAT
NAYLOR SUBDIVISION, REVISION 3, RESUBDIVISION OF LOTS 2 AND 3
CITY OF FRANKLIN PROJECT NO. 6092
FRANKLIN, TENNESSEE

Rev.	Date	Revision Description
1	4/7/16	City of Franklin Comments

LARRY C. WALLACE
REGISTERED ENGINEER
STATE OF TENNESSEE

Issue Date:	3/14/16
ELI Project No:	16-11-1101
Drafted By:	LCW
Checked By:	VWB

Sheet Title:

OVERALL ROW & ACCESS PLAN

Sheet No.

C4.0

Filename: W:\16-11-1101 Wynfield Village\CAD\Production Drawings\Preliminary Plat\Wynfiled Village ROW & Access Plan.dwg
Layout Name: C4.0 ROW & ACCESS PLAN
Plotted: Thursday, April 07, 2016 - 9:06 am
By: rpierce

TN STATE PLANE CORD., ZONE5301, FIPZONE 4100; NAD83 DATUM

GRAPHIC SCALE (IN FEET)

40 0 20 40 80

1 inch = 40 ft.

Notes:

1. The purpose of this preliminary plat is to combine two existing parcels and subdivide for creation of 14 new lots for a single family, detached development.
2. Additional land from map 79, parcel 6.01 will be added to lot 4 prior to final plat approval. otherwise lot 4 will be divided between lots 3 and 5.
3. Street light locations and quantities are approximate. final positioning and quantity shall be at the discretion of mtemc.
4. Residential fire sprinklers will be required in all new homes due to the length of the cul-de-sac.
5. There shall be no mowing, clearing, grading, construction, storage, or disturbance of vegetation in riparian buffers except as permitted by the city engineer, or his designee.

SITE DATA

PROJECT NAME:	WYNFIELD VILLAGE PRELIMINARY PLAT
PROJECT NUMBER:	6092
SUBDIVISION:	NAYLOR SUBDIVISION, REVISION 3 RESUBDIVISION OF LOTS 2 & 3
LOT NUMBERS:	LOTS 1-13 AND 14 BEING OPEN SPACE
ADDRESS:	821 MURFREESBORO ROAD
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	9TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 79, PARCELS 6.02 & 6.03
EXISTING ZONING:	R-3 RESIDENTIAL DISTRICT
CHARACTER AREA OVERLAY:	CENTRAL FRANKLIN CFCO4
LAND USE:	RESIDENTIAL
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
OTHER OVERLAYS:	FLOODWAY FRINGE OVERLAY (FFO)
ACREAGE OF SITE:	NEW LOT 1: 0.94 AC WYNFIELD: 7.07 AC MURF ROW 0.17 AC DEDICATION
TOTAL:	8.18 AC
PROPOSED GROSS DENSITY:	13U/8.18 AC
NET DENSITY:	1.59U / AC
PARKLAND DEDICATION:	12U X 1,200 SF = 14,400 SF FEES IN LIEU OF WILL BE DUE AT FINAL PLAT
DRAINAGE BASIN:	WATKINS BRANCH
MINIMUM REQUIRED SETBACK LINES & LOT REQUIREMENTS:	
FRONT:	25 FEET (LOCAL) & 80 FEET (ARTERIAL)
SIDE:	5 FEET (12 FEET BETWEEN BUILDINGS)
REAR:	30 FEET
MIN. LOT WIDTH:	60 FEET
MIN. LOT FRONTAGE:	48 FEET
MIN. LOT SIZE:	9,000 SF
OWNERS:	SARAH NAYLOR CHERRY & SUSAN NAYLOR MOORE CHERRY
ADDRESS:	821 MURFREESBORO ROAD FRANKLIN, TN 37064
APPLICANT:	BARLOW BUILDERS
ADDRESS:	1804 WILLIAMSON COURT, SUITE 107 BRENTWOOD, TN 37027
PHONE NUMBER:	(615) 533-0884
CONTACT NAME:	JORDAN CLARK
PLANNER:	GAMBLE DESIGN COLLECTIVE
ADDRESS:	144 SOUTHEAST PARKWAY, SUITE 200 FRANKLIN, TN 37064
PHONE NUMBER:	(615) 975-5765
CONTACT NAMES:	GREG GAMBLE
ENGINEER / LAND SURVEYOR:	ENERGY LAND & INFRASTRUCTURE
ADDRESS:	1420 DONELSON PIKE, SUITE A12 NASHVILLE, TN 37217
PHONE NUMBER:	(615) 383-6300
CONTACT NAMES:	CLAY WALLACE (ENGINEER) MIKE DIAL (SURVEYOR)

BUCKINGHAM CIRCLE
40' RO.W. (LOCAL)

CORONATION COURT
100' RO.W. (LOCAL)

SCALED FFO / 100 YR FLOODPLAIN PER PRELIMINARY FEMA FIRM COMMUNITY PANEL NO. 47187C0211G DATED SEPTEMBER 29, 2014

SANITARY SEWER EASEMENT TO BE ABANDONED

10' EXISTING SANITARY SEWER EASEMENT

20' EXISTING DRAINAGE EASEMENT

TOP OF BANK

PRELIMINARY 60' AVERAGE ZONE 2 WATER QUALITY BUFFER (30' MIN.) / 30' ZONE 1 WATER QUALITY BUFFER

STORMWATER MANAGEMENT / GREEN INFRASTRUCTURE BMP

50' EXISTING DRAINAGE EASEMENT

30' ZONE 1 WATER QUALITY BUFFER

20' DRAINAGE EASEMENT

20' SANITARY SEWER EASEMENT

WYNFIELD VILLAGE COURT
50' R.O.W. (LOCAL)

STORMWATER MANAGEMENT / GREEN INFRASTRUCTURE BMP

PRELIMINARY 60' AVERAGE ZONE 2 WATER QUALITY BUFFER (30' MIN.)

RALSTON CREEK

DRAINAGE EASEMENT TO BE ABANDONED

25' EXISTING DRAINAGE EASEMENT

EXISTING FENCE

44' CLASS "C" INCOMPTABILE BUFFER DUE TO ADJACENT LOT SIZE REDUCED TO 33' (25%) WITH PROPOSED FENCE

44' CLASS "C" INCOMPTABILE BUFFER DUE TO ADJACENT LOT SIZE REDUCED TO 33' (25%) WITH PROPOSED FENCE

484' FROM EXISTING STREET INTERSECTION TO NEAREST LOT LINE

FUTURE COF SIDEWALK

32' R.O.W. DEDICATION

MURFREESBORO ROAD / SR 96
66' RO.W. (MAJOR ARTERIAL)

PROPOSED LOT 1 DRIVEWAY CONNECTION

EXISTING LOT 1 DRIVEWAY CONNECTION TO BE ABANDONED

SANITARY SEWER SERVICE TO BE ABANDONED

SCALED FFO / 100 YR FLOODPLAIN PER PRELIMINARY FEMA FIRM COMMUNITY PANEL NO. 47187C0211G DATED SEPTEMBER 29, 2014

BOUNDARY LINE TAG (TYP)

GLENBROOK DRIVE
40' RO.W. (LOCAL)

LEE GORDON O
LEE MINA J
MAP 079H-F, PARCEL 12
DB 871, PG 160
R.O.W.C., TN

WILLIAMS PAUL E
WILLIAMS CHRISTINE M
MAP 079H-F, PARCEL 11
DB 1174, PG 691
R.O.W.C., TN

CARRINGER DENISE FOLSOM
CARRINGER THOMAS
MAP 079H-F, PARCEL 10
DB 5120, PG 924
R.O.W.C., TN

SWADE KELTON JUDAH
MAP 079H-F, PARCEL 9
DB 2177, PG 15
R.O.W.C., TN

STEWART KELLY
MAP 079H-F, PARCEL 8
DB 6237, PG 380
R.O.W.C., TN

WOLFF JAMES A
WOLFF ANNL
MAP 079H-F, PARCEL 7
DB 1123, PG 440
R.O.W.C., TN

MAHONEY GREGORY L
MAHONEY GLENDA D
MAP 079H-F, PARCEL 6
DB 1551, PG 790
R.O.W.C., TN

BROWN THOMAS E
BROWN DENISE K
MAP 079H-F, PARCEL 4
DB 2019, PG 391
R.O.W.C., TN

JOHNSON MICHAEL D
JOHNSON CAIL WALLIN
MAP 079H-F, PARCEL 3
DB 4773, PG 227
R.O.W.C., TN

WYNNE EDWARD IAN
WYNNE MEGHANN D
MAP 079H-F, PARCEL 13
DB 5753, PG 962
R.O.W.C., TN

COON EDWARD J
COON BARBARA W
MAP 079H-F, PARCEL 14
DB 823, PG 899
R.O.W.C., TN

STRICKLAND MICHAEL D
STRICKLAND MARTHA F
MAP 079H-F, PARCEL 15
DB 1502, PG 539
R.O.W.C., TN

FRY RICKY D TR
FRY SUE S TR
MAP 079H-F, PARCEL 16
DB 5100, PG 523
R.O.W.C., TN

CANARY SARAH KAYLOR
CHERRY SUSAN NAYLOR MOORE
MAP 079, PARCEL 6.02
DB 3498, PG 948
R.O.W.C., TN

MOORE SUSAN NAYLOR
MAP 079, PARCEL 6.03
DB 1413, PG 481
R.O.W.C., TN

BENTLEY GEORGE RAY
BENTLEY JEAN
MAP 079, PARCEL 6.01
DB 1158, PG 242
R.O.W.C., TN

SWAIN AVALYN BERRY
SWAIN TIMOTHY W II
MAP 079, PARCEL 6.07
DB 3509, PG 973
R.O.W.C., TN

SWAIN AVALYN BERRY
SWAIN TIMOTHY W II
MAP 079, PARCEL 6
DB 3509, PG 949
R.O.W.C., TN

MILLER MARK H
MILLER TARIN H
MAP 079H-G, PARCEL 19
DB 3099, PG 122
R.O.W.C., TN

STALEY MELISSA D
MAP 079H-G, PARCEL 18
DB 5654, PG 649
R.O.W.C., TN

BOUCHEY JAMES P
BOUCHEY JEAN M
MAP 079H-G, PARCEL 21
DB 1032, PG 734
R.O.W.C., TN

BLALACK KATHY B REV LIV TRUST
MAP 079H-G, PARCEL 17
DB 6007, PG 572
R.O.W.C., TN

SHEPHERD TRAVIS J
SHEPHERD STEPHANIE DIANE
MAP 079H-G, PARCEL 16
DB 5271, PG 946
R.O.W.C., TN

TABSCOTT CHRIS
TABSCOTT DENISE M
MAP 079H-G, PARCEL 14
DB 3992, PG 985
R.O.W.C., TN

Boundary Line Table

Line #	Length	Direction
L1	285.00	S7° 47' 42"W
L2	466.73	S7° 44' 08"W
L3	14.45	S66° 15' 36"W
L4	73.16	S65° 54' 04"W
L5	127.14	S62° 55' 51"W
L6	224.31	S8° 32' 12"W
L7	146.25	N85° 18' 14"W
L8	72.88	N85° 18' 35"W
L9	69.44	N85° 11' 26"W
L10	178.11	N8° 48' 00"E
L11	237.24	N8° 57' 19"E
L12	61.01	N8° 23' 36"E
L13	58.98	N8° 58' 28"E
L14	77.66	N8° 30' 45"E
L15	62.83	N9° 35' 47"E
L16	221.02	S80° 40' 01"E
L17	433.87	N8° 40' 01"E
L18	179.16	S83° 54' 01"E
L19	50.00	S83° 54' 44"E

Lot Table

Lot #	Square Feet	Acres
1	40,787	0.94
2	9,005	0.21
3	11,199	0.26
4	9,726	0.22
5	9,987	0.23
6	12,468	0.29
7	9,007	0.21
8	9,001	0.21
9	9,893	0.23
10	9,530	0.22
11	9,100	0.21
12	9,100	0.21
13	11,620	0.27

Open Space Table

Lot #	Square Feet	Acres
14	137,629	3.16

ROW Table

Lot #	Square Feet	Acres
ROW	58,353	1.34

Legend

- Fire Hydrant
- W — Water Line
- S — Sewer Line
- (S) Sewer Manhole
- Street Light
- Proposed Stormwater Inlet
- Concrete Sidewalk
- (1) Lot Number

Property Description (Wynfield Village)

Being a parcel of land located in the 9th Civil District of Williamson County, Tennessee, being lands of Sarah and Susan Naylor described in Deed Book 3498 Page 45, Tax Map 79 Parcel 6.02 and lands of Susan Moore described in Deed Book 1413 Page 481, Tax Map 79 Parcel 6.03, and being more particularly described as follows:

Beginning at a concrete monument found along the north margin of Mufreesboro Road (State Highway 96- 66' ROW), and being the southeast corner of Avalyn Berry and Timothy W Swain (DB 3509 Page 949);Thence along the East line of Swain, N 07 Deg 47 Min 42 Sec E a distance of 285.00' to the northeast corner of Swain, and the southeast corner of Swain (DB 3509 Page 973);Thence with the East line of Swain, N 07 Deg 44 Min 08 Sec E a distance of 466.73' to a ½" iron rod found, the northeast corner of Swain and being the South line of Chris and Denise Tabscott (DB 5992 Page 983);Thence along the South line of Tabscott, N 66 Deg 15 Min 36 Sec E a distance of 14.45' to a ½" iron rod found, being the southwest corner of Travis and Stephanie Shepherd (DB 5271 Page 946);Thence along the South line of Shepherd, N 65 Deg 54 Min 04 Sec E a distance of 73.16' to a ½" iron rod found, being the southwest corner of Kathy B Blalack Revocable Living Trust (DB 6007 Page 572);Thence along the South line of Blalack, N 62 Deg 55 Min 51 Sec E a distance of 127.14' to the southwest corner of Melissa D Staley (DB 5654 Page 649);Thence along the East line of Staley and Benjamin and Jessica Maxwell (DB 6517 Page 562), N 08 Deg 32 Min 12 Sec E a distance of 224.31' to a ½" iron rod, being the southwest corner of Ricky and Sue Fry (DB 5100 Page 523);Thence along the South line of Fry, S 85 Deg 18 Min 14 Sec E a distance of 146.25' to a ½" iron rod found, the southwest corner of Michael and Martha Strickland (DB 1502 Page 539);Thence along the South line of Strickland, S 85 Deg 18 Min 35 Sec E a distance of 72.88' to an iron rod found, the southwest corner of Edward and Barbara Coon (DB 823 Page 599);Thence along the South line of Coon, S 85 Deg 11 Min 26 Sec E a distance of 69.44' to the southeast corner of Coon and the north west corner of Gordon and Mina Lee (DB 871 Page 160);Thence along the West line of Lee, S 08 Deg 48 Min 00 Sec W a distance of 178.11' to a ½" iron rod found, the southwest corner of Paul and Christine Williams (DB 1174 Page 691) and the northwest corner of Denise Carringer (DB 5120 Page 924);Thence along the West line of Carringer, Kelton Swade (DB 2177 Page 15) and Kelly Stewart (DB 6237 Page 380), S 08 Deg 57 Min 19 Sec W a distance of 237.24' to a ½" iron rod found, the southwest corner of Stewart and the northwest corner of James Wolff (DB 1123 Page 440);Thence along the West line of Wolff, S 08 Deg 23 Min 36 Sec W a distance of 61.01' to a ½" iron rod found, being the southwest corner of Wolff and the northwest corner of Gregory and Glenda Mahoney (DB 1551 Page 790);Thence along the West line of Mahoney, S 08 Deg 58 Min 28 Sec W a distance of 58.98' to an iron rod found, being the southwest corner of Mahoney and the northwest corner of Thomas and Denise Brown (DB 2019 Page 391);Thence along the West line of Brown, S 08 Deg 30 Min 45 Sec W a distance of 77.66' to an iron rod found, being the southwest corner of Brown and the northwest corner of Michael and Gail Johnson (DB 4773 Page 227);Thence along the West line of Johnson, S 09 Deg 35 Min 47 Sec W a distance of 62.83' to a 5/8" iron rod, being the northwest corner of George and Jean Bentley (DB 1158 Page 242);Thence along the North line of Bentley, N 80 Deg 40 Min 01 Sec W a distance of 221.02' to an iron rod set, being the northwest corner of Bentley;Thence along the West line of Bentley, S 08 Deg 40 Min 01 Sec W a distance of 433.87' to the northern margin of Murfreesboro Road (State Route 96- 66' ROW);Thence along the northern margin of Murfreesboro Road (State Route 96) N 83 Deg 54 Min 01 Sec W a distance of 179.16' to an iron rod found;Thence continuing along the northern margin of Murfreesboro Road (State Route 96) N 83 Deg 54 Min 44 Sec W a distance of 50.00' to the point of beginning, having an area of 356,404.98 square feet, 8.18 acres, according to a survey by Energy, Land, and Infrastructure on April 16, 2015.

GDC
GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A12 • NASHVILLE, TN 37217
OFFICE: 615.383.6300 • WWW.ELI-LLC.COM
ENGINEERS • SURVEYORS • INFRASTRUCTURE • ENVIRONMENTAL

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WYNFIELD VILLAGE
PRELIMINARY PLAT
NAYLOR SUBDIVISION, REVISION 3,
RESUBDIVISION OF LOTS 2 AND 3
CITY OF FRANKLIN, TENNESSEE
FRANKLIN PROJECT NO. 6092

Rev.	Date	Revision Description
1	4/7/16	City of Franklin Comments

ARTHUR M. DIAL — 2417 — LICENSED PROFESSIONAL LAND SURVEYOR — STATE OF TENNESSEE — 4/7/16

Issue Date:	3/14/16
ELI Project No:	16-11-1101
Drafted By:	LCW
Checked By:	VWB

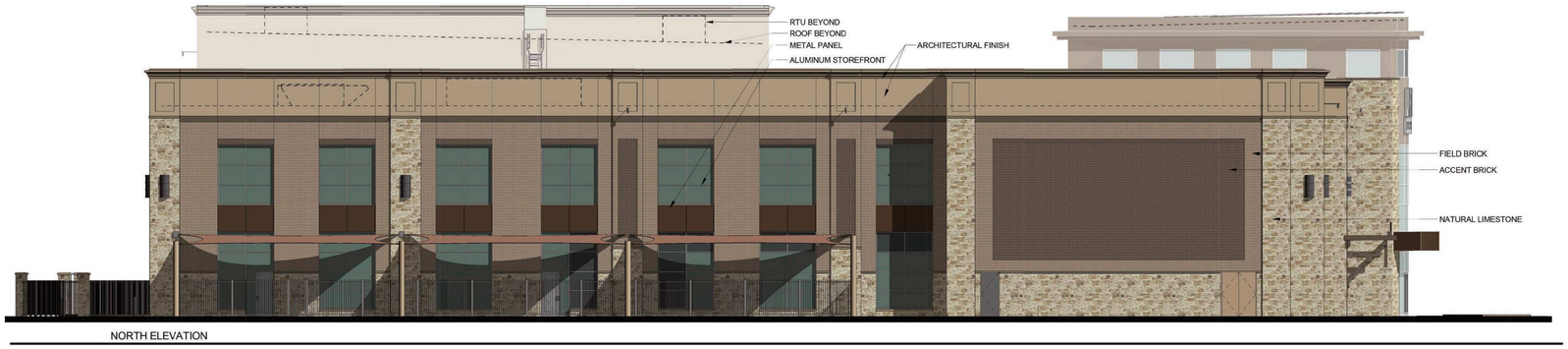
Sheet Title:

PRELIMINARY PLAT

Sheet No.

C2.0

Filename: W:\16-11-1101 Wynfield Village\CAD\Production Drawings\Preliminary Plat\C2.0 PRELIMINARY PLAT.dwg
Layout: C2.0 PRELIMINARY PLAT
Plotted: Thursday, April 07, 2016 - 9:48 am
By: clayw



NORTH ELEVATION

NORTH ELEVATION	AREA (SF)	PERCENTAGE
Brick	3342	34.15%
Stone	2431	24.84%
Metal Panel	356	3.64%
Storefront	1891	19.32%
Architectural Finish	1767	18.05%
TOTAL	9787	100.00%

EAST ELEVATION

EAST ELEVATION	AREA (SF)	PERCENTAGE
Brick	5259	39.16%
Stone	2448	18.23%
Metal Panel	282	2.10%
Storefront	2417	18.00%
Architectural Finish	3024	22.52%
TOTAL	13430	100.00%

SOUTH ELEVATION (FACING LIBERTY PIKE)

SOUTH ELEVATION	AREA (SF)	PERCENTAGE
Brick	3630	36.92%
Stone	1641	16.69%
Metal Panel	308	3.13%
Storefront	2094	21.30%
Architectural Finish	2158	21.95%
TOTAL	9831	100.00%

WEST ELEVATION (FACING CAROTHERS PARKWAY)

WEST ELEVATION	AREA (SF)	PERCENTAGE
Brick	3701	27.76%
Stone	2398	17.98%
Metal Panel	1278	9.58%
Storefront	3959	29.69%
Architectural Finish	1998	14.98%
TOTAL	13334	100.00%

OVERALL	AREA (SF)	PERCENTAGE
Brick	16527	35.18%
Stone	8918	18.98%
Metal Panel	2224	4.73%
Storefront	10361	22.06%
Architectural Finish	8947	19.05%
TOTAL	46977	100.00%

FRANKLIN TN

CONCEPTUAL BUILDING ELEVATIONS

03/14/16

LIFE TIME

Existing FH
Test FH
Static = 132 PSI
Residual = 122 PSI
Peformed By
Hethcoat & Davis On
October 16, 2015

Flow FH
Flow = 1120 GPM

Carothers Parkway
(Major Arterial)

LIBERTY PIKE
(Minor Arterial)

BENCHMARK
NE BOLT
COVER OF LS
ELEV.=778.69
(NAVD 1988/GEOID 2003)

BENCHMARK
SE CORNER TOP
METAL FLANGE OF LS
ELEV.=787.67
(NAVD 1988/GEOID 2003)

Future Access
Constructed By Out
Parcel A or B
Developer

Proposed Right Turn Lane
(Details W/ Roadway
Improvement Plans)

Proposed Signal
(Details W/ Roadway
Improvement Plans)

Proposed Median (Details W/
Roadway Improvements Plan

Proposed
Out Parcel "A"
0.98± Acres

Proposed
Out Parcel "B"
1.09± Acres

Proposed
Out Parcel "C"
2.28± Acres

Proposed
Out Parcel "D"
1.65± Acres

Lot 1
15.15± Acres

Prop. Building 1
2-Story
120,577 Sq.Ft.
FFE: 791.4
(See Arch. Plans For Dims)
Floor 1: 61,205 Sq.Ft.
Floor 2: 59,372 Sq.Ft.

Future Building 2
3-Story
48,000 Sq.Ft.
FFE: 799.5
Floor 1: Retail
Floor 2: Office
Floor 3: Office

Storm Water
Area

Pool

Pool

Loading
Zone

Loading
Zone

Dumpster For
Building 1

Dumpster For
Building 2

Retaining
Wall

Landfill Limits

Sidewalk
Flush With
Pavement

Proposed
Concrete
Sidewalk

8' Wide Concrete
Multi-Modal Trail

5' Wide
Concrete
Sidewalk

Access Easement

Access Esmt.

HILLSIDE/HILLCREST
OVERLAY ZONING DISTRICT
PER CITY OF FRANKLIN

(40.12)
SS KNOLL TOP, LLC
BOOK 6345, PAGE 883, R.O.W.C.

(20)
EZEAL CAROTHERS
DEED BOOK 65, PAGE 3,
R.O.W.C.

(9)
OVATION SUBDIVISION
PLAT BOOK 60, PAGE 95,
R.O.W.C.

(18.05)
SS McEWEN, LLC
DEED BOOK 5770, PAGE 198,
R.O.W.C.

CURVE	DELTA	RADIUS	TANGENT	ARC	CHORD	
C1	10°19'44"	640.91'	57.93'	115.54'	N79°06'06"W	115.38'
C3	02°01'57"	1,400.00'	24.83'	49.66'	S72°09'31"E	49.66'
C4	80°58'35"	40.00'	34.15'	56.53'	N43°59'44"W	51.94'
C6	06°43'49"	1,076.24'	63.28'	126.42'	N00°08'32"W	126.35'
C7	13°53'16"	539.17'	65.67'	130.69'	S11°52'10"W	130.37'
C8	13°11'21"	1,076.24'	124.42'	247.74'	N09°49'03"E	247.20'
C9	15°06'08"	1,076.24'	142.67'	283.68'	N23°57'47"E	282.86'
C10	04°22'07"	1,076.24'	41.05'	82.06'	N33°41'55"E	82.04'
C11	23°58'15"	74.00'	15.71'	30.96'	N70°10'44"W	30.73'

1. The applicant requests a modification of standards to allow a reduced amount of "masonry" finish allowed on the Architectural Elevation facing Carothers Parkway as prescribed in the City of Franklin Zoning Ordinance (5.3.6:7a). The proposed masonry finishes constitute Sixty point seven-two percent (60.72%) of the architectural façade of the western elevation while the remaining material consists of glass Store front and Metal Panels which creates the look of an integrated glass curtain wall system as depicted in the rendered Architectural Elevations.

2. The applicant requests a modification of standards to reduce the number of required loading areas for the proposed Life Time Fitness building as prescribe in the City of Franklin Zoning Ordinance (5.9.12:2). The proposed building square footage would require three (3) loading and unloading zones, but based upon historical data from similar Life Time Fitness facilities two (2) loading and unloading zones will be more than sufficient for this facilities' delivery and operational needs.

3. The applicant requests a modification of standards to reduce the number of required loading areas for the proposed future building as prescribe in the City of Franklin Zoning Ordinance (5.9.12:2). The proposed future building square footage would require two (2) loading and unloading zones, but the anticipated uses of the future building indicate that one (1) loading and unloading zone will meet the anticipated needs.

PROJECT NAME: CAROTHERS CROSSING EAST
COF PROJECT NUMBER: TBD
SUBDIVISION: DUKE PROPERTY SUBDIVISION
MAP, PARCEL NUMBERS: 79, 40
ADDRESS: 1214 LIBERTY PIKE
CITY: FRANKLIN
COUNTY: WILLIAMSON
STATE: TENNESSEE
CIVIL DISTRICT: 9

EXISTING ZONING & CHARACTER AREA OVERLAY: GC - GENERAL COMMERCIAL & MECO-4
PROPOSED LAND USE: GENERAL COMMERCIAL
PROPOSED ZONING: GC
OVERLAYS: HHO BUFFER ON SITE
APPLICABLE DEVELOPMENT STANDARDS: CONVENTIONAL
SITE ACREAGE: +/- 21.79 AC
SITE SQUARE FOOTAGE: +/- 949,057 SF
PUD SITE ACREAGE: +/- 15.15 AC
PUD SITE SQUARE FOOTAGE: +/- 659,796 SF

MINIMUM PERIMETER REQUIRED SETBACK LINES:
YARD FRONTING ON ANY STREET: 22.75' (12.75' PROPOSED R.O.W. DEDICATION + 10')
SIDE YARD: 20 FEET
BUILDING SQUARE FOOTAGE: +/- 168,577 SF
BUILDING HEIGHT: 3 STORIES SHOWN
LANDSCAPE SURFACE RATIO PROVIDED: 0.37
MIN. LANDSCAPE SURFACE RATIO: 0.30
MIN. PARKING REQUIREMENT: RETAIL/COMMERCIAL USE (3.33 SPACES PER 1000/SF OF BLDG.) = 562 SPACES
MAX. PARKING LIMIT: 675 SPACES
PARKING PROVIDED: 760 SPACES
PARKING OVER MAX. LIMIT: 85 SPACE (TO BE PERVIOUS PAVERS)
SPECIMENT TREE CALIPER INCHES: 1166
PARKLAND DEDICATION REQUIREMENT: N/A

OWNER:
GLENN WILSON AND
GLENN MCGEHEE - SS McEWEN, LLC
501 CORPORATE CENTER DRIVE, #315
FRANKLIN, TN 37067

DEVELOPER:
SOUTHSTAR
501 CORPORATE CENTER DRIVE, #315
FRANKLIN, TN 37067
615.472.8916
CONTACT: RALPH KNAUSS

APPLICANT:
KISER & VOGRIN DESIGN
5005 MERIDIAN BLVD. STE 100
FRANKLIN, TN 37067
CONTACT: GARY VOGRIN
615.813.0862
GARY@KISERVOGRIN.COM

0 50' 100' 150'
SCALE: 1"= 50'

KISER VOGRIN DESIGN
5005 MERIDIAN BLVD | SUITE 100
FRANKLIN, TN 37067
615.813.0862 | www.kiservogrin.com

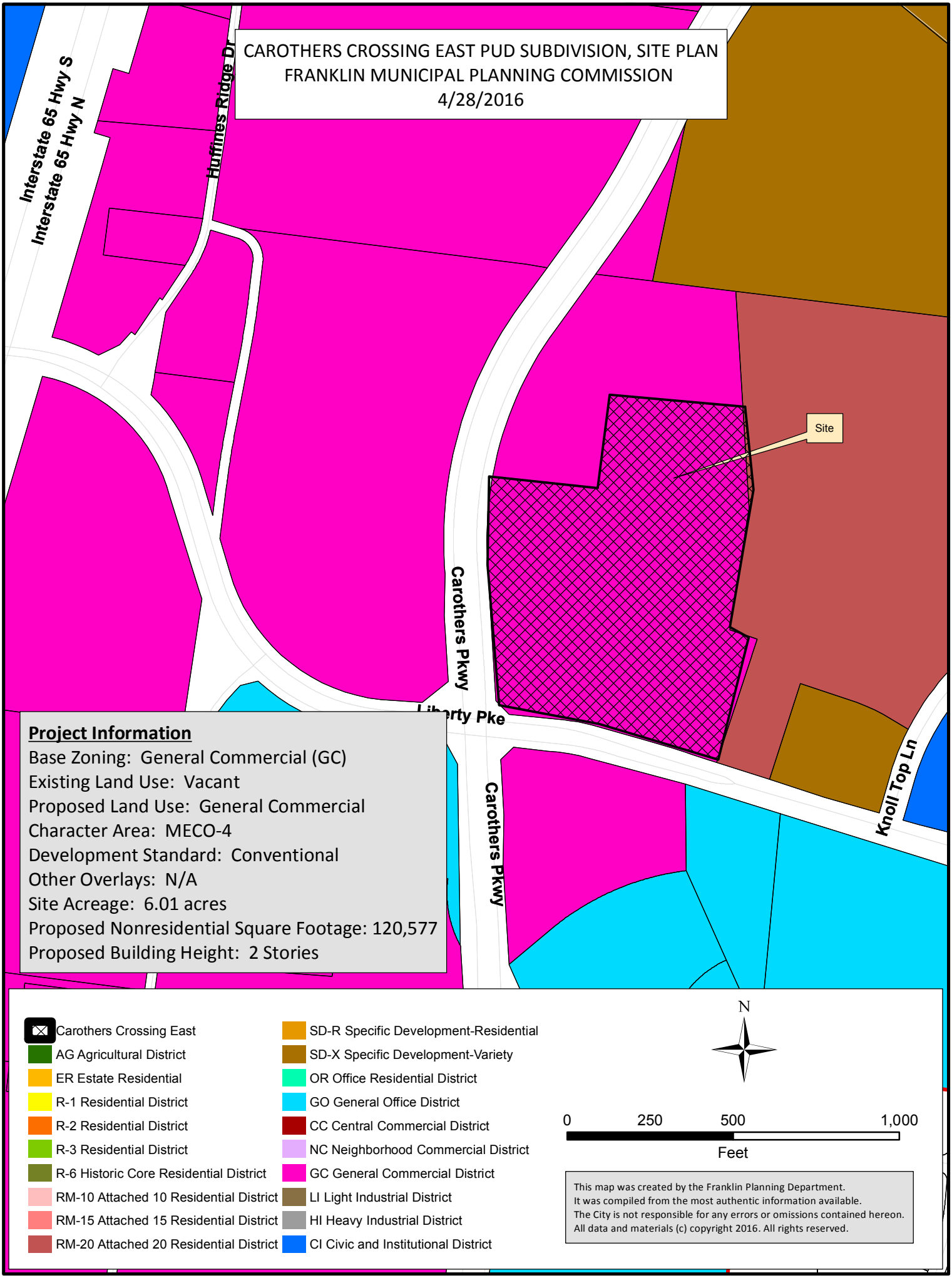
SEC, Inc.
SITE ENGINEERING CONSULTANTS
ENGINEERING SURVEYING LAND PLANNING
LANDSCAPE ARCHITECTURE

MATTHEW A. TAYLOR 3
STATE OF TENNESSEE
REGISTERED LANDSCAPE ARCHITECT

CAROTHERS CROSSING EAST PUD SUBDIVISION SECTION1, SITE PLAN
INITIAL SITE PLAN RESUBMITTAL
SITE PLAN
COF #6071
Franklin, Williamson Co, TN

REVISIONS:
4-7-2016: Staff Comments

DATE: 3-14-16
DESIGNED BY: MAT
DRAWN BY: SJA/CRB3
CHECKED BY: JM
Q.C. BY: MAT
SCALE: 1" = 50'
PROJECT #: 14432
SHEET NUMBER:
C2.0


CAROTHERS CROSSING EAST PUD SUBDIVISION, SITE PLAN
FRANKLIN MUNICIPAL PLANNING COMMISSION
4/28/2016
Interstate 65 Hwy S
Interstate 65 Hwy N
Huffines Ridge Dr
Site
Carothers Pkwy
Liberty Pke
Carothers Pkwy
Knoll Top Ln
Project Information
Base Zoning: General Commercial (GC)
Existing Land Use: Vacant
Proposed Land Use: General Commercial
Character Area: MECO-4
Development Standard: Conventional
Other Overlays: N/A
Site Acreage: 6.01 acres
Proposed Nonresidential Square Footage: 120,577
Proposed Building Height: 2 Stories
Carothers Crossing East
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
250
500
1,000
Feet
This map was created by the Franklin Planning Department.
It was compiled from the most authentic information available.
The City is not responsible for any errors or omissions contained hereon.
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COF no: 6071

CONDITIONS OF APPROVAL:

Engineering - Site Plan Checklist

General Comments

1. J. Stormwater Managment Plan

- As discussed with previously, the proposed underground detention does not qualify as a Green Infrastructure practice under GIP-11 (Rain Tank / Cistern) of the BMP manual unless the required treatment volume is re-used on-site (for example: pumped to feed on-site irrigation). While this may be combined with traditional detention, it must be demonstrated how the required treatment volume (14,174 cubic feet per the submitted calculator) is re-used and/or infiltrated on-site, and at what rate this volume is drawn down so that it is available for the next storm event. As currently depicted, the simple detention of this volume does not meet Green Infrastructure requirements.

2. M. Sanitary Sewer Design and Plan & Profile

- The previous comment "Provide vertical locations of all utilities and drainage crossing the sewer line on the sewer profiles. Provide a vertical separation of at least 18 inches." was not completely addressed. There are 2 different water lines between manhole 3 and manhole 4. There is a water line near manhole 1. Show all water lines on the utility plans and the sewer profiles.

3. I. Grading Plan

- The previous comment "There must be no proposed slope steeper than 3:1." was not completely addressed. Clearly label the steep slopes run:rise that appear to be approximately 3:1, on the grading plans, to assure that they are no steeper than 3:1.

4. J. Stormwater Managment Plan

- A soil infiltration test report will be required for all soils where water quality BMPs are being proposed to show soils underneath BMP's have adequate infiltration rates as per the City of Franklin's BMP Manual. **Test results shall be submitted to the City's Engineering Dept. prior to Post-PC Approval of the plans, at the latest.** Earlier testing is encouraged to aid in BMP design and to ensure that the approval process is not delayed. If the test results do not support the proposed BMP design, revisions and/or additional measures will be required to ensure stormwater detention and water quality requirements are being met.

If all BMPs are designed with underdrains, and no reduction of required detention volume is being sought to account for anticipated infiltration, standard boring results that indicate absence of groundwater or bedrock within 2' of the bottom elevation of the BMP may be substituted for infiltration testing (excluding GIP-04 Infiltration Trench and GIP-03 Level 2 Permeable Pavement, which require known infiltration rates for the design of the BMP). **These results shall be submitted to the City's Engineering Dept. prior to final Post-PC Approval of the Site Plan.**

5. J. Stormwater Managment Plan

- Applicant shall specify amended soil depth for each of the proposed bioretention areas. Minimum depth of amended soil is 36" for Level 2 bioretention, but verify what depth is required based on the surface area and required treatment volume of each GIP.

6. J. Stormwater Managment Plan

- Corrugated Metal Pipe (CMP) is not an approved material for use in traffic areas. Applicant shall provide an alternate material for construction of the proposed underground detention. The proposed pipe material was overlooked in the Initial Review of the Site Plan.

7. V. Site Permits

- The Stormwater/Grading & Utility permit applications have been uploaded to the document manager. Please have the application completed and submit with ORIGINAL, signed and notarized Agreements and Fees (listed on permit) to Engineering.

for information only

Fire-Planning

15058 PUD Site Plan Pre-App Submittal.pdf

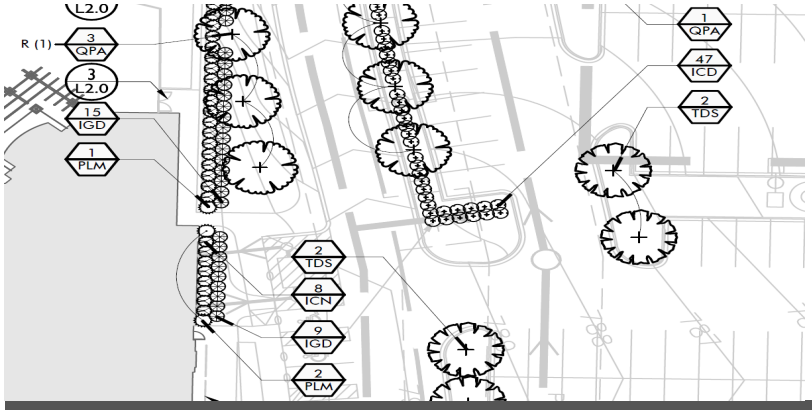
8. Landscaping

- The applicant has not fully addressed the comment/concern regarding the coordination of landscaping and utility plan sheets.

L1.2 continues to indicate landscaping "on top" of the proposed fire hydrant which requires a minimum of three (3) feet of clearance to the sides and rear and no obstruction to the front.

The applicant is again asked to coordinate the landscaping sheets to prevent conflict with utility infrastructure and fire protection equipment.

Southwestern corner of the building:



Performance Agreement and Surety

General Comments

9. Engineering Sureties

Applicant shall post sureties in the following amounts:

II. City Sewer: $ 424,000
IV: Private Streets: $ 305,000
VI. Public Sidewalks: $ 79,000
VII. Stormwater Drainage: $ 1,350,000
VIII. Green Infrastructure: $ 228,000

10. Landscape

- **Landscape surety $103,000.00**

Tree Bank Contribution

$111,900.00 cash Tree Bank contribution

Applicant is removing 956 caliper inches, and due to site constraints, can only replace 210 caliper inches. The remaining 746 caliper inches shall be a Tree Bank contribution. at $150.00 per caliper inch for a total of $111,900.00.
Therefore, the applicant shall provide a cash contribution of $111,900.00 in the form of a cashier's check payable to *City of Franklin.* By submitting the aforementioned cash contribution, the applicant acknowledges and agrees that there is no expectation of reimbursement of any of the funds stipulated in this condition of approval, nor any expectation of any payment for interest. Applicant shall submit the cashier's check, payable to *City of Franklin*, to the attention of the Planning and Sustainability Department

Planning

General Comments

11. Project number

- Applicant shall update COF Project # on site data chart for sheets:

C 2.0
C 2.1a
C 2.1b
C 2.1c
C 2.1d

Planning (Landscape)

General Comments

12. Specimen Tree Replacement

- The applicant shall adjust the Specimen Tree Replacement Schedule to reflect the revised one of 4.14.16

This will be 956 caliper of inches to be replaced. With 210 caliper inches replaced on this site and 746 caliper of inches contributed to COF Tree Bank.
This shall be accomplished at Post PC.

Stormwater

General Comments

13. Pervious Concrete/Pavers

- Previous comment not addressed, "Applicant shall show underdrain connections to current shown stormwater pipes for the permeable pavers onsite."

14. Long Term Maintenance Plan

- Fill out and complete page 1-2 of the LTMP. Include sheets L1.1-L1.13

Water/Sewer

General Comments

15. Sanitary sewer

- Applicant shall revise as noted.
  - structure on the west side corner of the entrance off of Liberty Pk on sanitary sewer easement shall be removed.
  - A concrete cap shall be placed on line at station 0+25 not encased.
  - The line between MH2 & MH3 shall shown proper separation between water & sewer. The current separation will not be sufficient to maintain the sewer main.
  - Applicant shall field verify that there is not another existing water main to the north of the shown existing 12" water line. Three utility districts have water lines servicing this area.
  - Storm structure head wall between MH3 & MH4 shall be off edge of easement.
  - Easement between MH6 & MH9 shall be 30' for the duration of the line. The easement cannot change in the middle of the sewer main.
  - Any sewer mains that are at or more than 12' deep shall be DIP. The appropriate sewer easements shall be provided.
  - Engineered fill note shall be added to notes.
  - A separation of at least 5' shall be shown between MH 11 & storm structure
  - Applicant shall clarify lines shown coming off of sewer around station 5+00. They may be an easement overlapping.
  - A conflict between storm sewer and sanitary sewer between MH's 12 &13, proper separation shall be shown for the purpose of safe maintenance of sewer line. Storm structures shall be relocated. The storm line shall not parallel the sewer line in the easement.
  - Structures shall not be in easement in line. May be monument sign
  - Water line on south side along Liberty pk shall be shown & identified in the sewer plan and profile
  - All utility crossings on offsite sewer shall be shown & identified
  - City of Franklin water details shall be removed water is not COF
  - Cleanouts shall be at edge of easements & placed in traffic bearing box where applicable.

16. Off site sewer

- Applicant shall revise off-site sewer as noted:
  - Due to the applicant adding the existing water line in the off-site sewer plan, the separation between the proposed sewer and the existing waterline shall be achieved.
  - All utility crossings shall be added to the sewer plan and profile.
  - The off-site sewer lines shall be approved prior to construction being started on the site plan.

This comment was added due to utility crossings being shown on the re-submittal.

ORDINANCE 2016-010

TO BE ENTITLED: "AN ORDINANCE TO AMEND CHAPTER 5 OF THE ZONING ORDINANCE OF THE CITY OF FRANKLIN, TENNESSEE, SUBSECTION 5.8.5, PERTAINING TO FLOODPLAIN PROTECTION."

WHEREAS, the City of Franklin is a participant in the National Flood Insurance Program (NFIP); and

WHEREAS, the NFIP and FEMA require local communities to maintain certain requirements; and

WHEREAS, this Ordinance amends the Franklin Zoning Ordinance to update the list of Flood Insurance Rate Map (FIRM), Community Panel Numbers; and

WHEREAS, this text amendment is in the best interest of the citizens of Franklin.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF MAYOR AND ALDERMEN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That Chapter 5, Subsection 5.8.5 (2) (b) of the Franklin Zoning Ordinance is hereby amended to add the following text noted in **bold,** and is approved to read as follows:

(b) Basis for Establishing the Areas of Special Flood Hazard
The Areas of Special Flood Hazard identified in the City of Franklin, Tennessee, as identified by FEMA, and in its Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM), Community Panel Numbers 47187C0180F; 47187C0182F; **47187CO184F;** 47187C0190F; 47187C0192F; 47187C0195F; 47187C0203F; 47187C0204F; 47187C0205F; 47187C0208F; 47187C0209F; 47187C0211F; 47187C0212F; 47187C0213F; 47187C0214F; 47187C0220F; 47187C0230F; 47187C0335F**; 47187CO355F; 47187CO360F;** dated, September 29, 2006, along with all supporting technical data, are adopted by reference and declared to be a part of Section 5.8.5.

SECTION II. BE IT FINALLY ORDAINED by the Board of Mayor and Aldermen of the City of Franklin, Tennessee, that this Ordinance shall take effect from and after its passage on third and final reading, the health, safety, and welfare of the citizens requiring it.

ATTEST:

By: _____
Eric Stuckey
City Administrator/Recorder

CITY OF FRANKLIN, TENNESSEE:

By: _____
Dr. Ken Moore
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

Law Dept. approved 04.15.16

PLANNING COMMISSION RECOMMENDED: 04-28-16

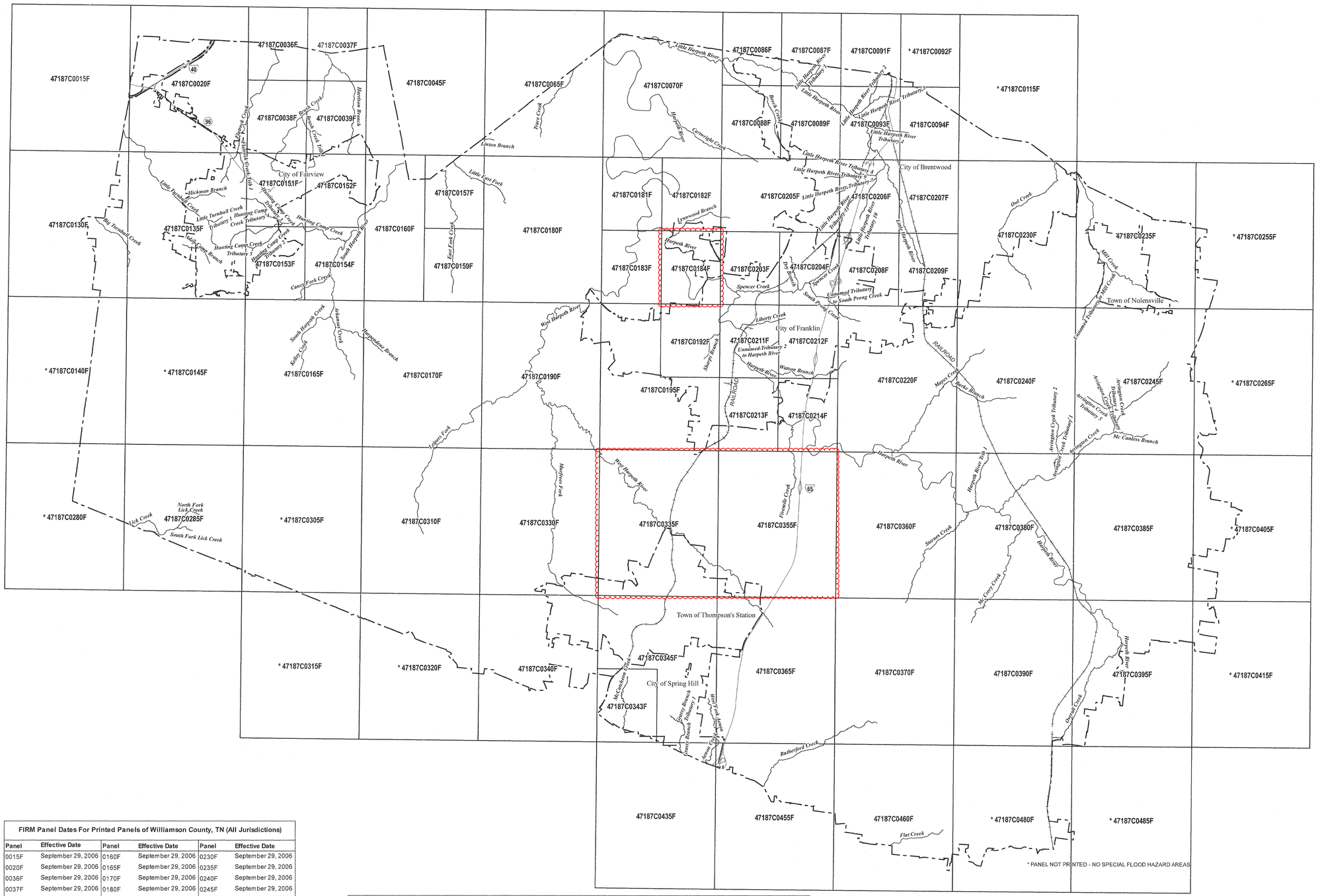
PASSED FIRST READING: _____

PUBLIC HEARING HELD: _____

PASSED SECOND READING: _____

PASSED THIRD READING: _____

Law Dept. approved 04.15.16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City of Fairview
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City of Brentwood
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Town of Nolensville
* 47187C0140F
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City of Franklin
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47187C0360F
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Town of Thompson's Station
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47187C0365F
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47187C0395F
* 47187C0415F
City of Spring Hill
47187C0435F
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* 47187C0485F
Little Harpeth River
Trace Creek
Linton Branch
Harpeth River
Carnright Creek
Beech Creek
Little Harpeth River Tributary 6
Little Harpeth River Tributary 5
Little Harpeth River Tributary 3
Little Harpeth River Tributary 4
Little Harpeth River Tributary 8
Little Harpeth River Tributary 9
Little Harpeth River Tributary 10
Little Harpeth River Tributary 11
Little Harpeth River Tributary 12
Little Harpeth River Tributary 13
Little Harpeth River Tributary 14
Little Harpeth River Tributary 15
Little Harpeth River Tributary 16
Little Harpeth River Tributary 17
Little Harpeth River Tributary 18
Little Harpeth River Tributary 19
Little East Fork
East Fork Creek
Owl Creek
Mill Creek
Unnamed Tributary to Mill Creek
Lynnwood Branch
Spencer Creek
DB Branch
Unnamed Tributary to South Prong Creek
South Prong Creek
Liberty Creek
Unnamed Tributary 2 to Harpeth River
Sharps Branch
Watson Branch
Harpeth River
RAILROAD
Mayes Creek
Burke Branch
Arrington Creek Tributary 2
Arrington Creek Tributary 1
Arrington Creek Tributary 3
Arrington Creek
Mc Cantless Branch
Arrington Creek Tributary 4
Harpeth River Tributary 1
Harpeth River
West Harpeth River
Fivemile Creek
Harpeth River Tributary 2
Harpeth River Tributary 3
Harpeth River Tributary 4
Harpeth River Tributary 5
Harpeth River Tributary 6
Harpeth River Tributary 7
Harpeth River Tributary 8
Harpeth River Tributary 9
Harpeth River Tributary 10
Harpeth River Tributary 11
Harpeth River Tributary

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 16. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Williamson County, Tennessee.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

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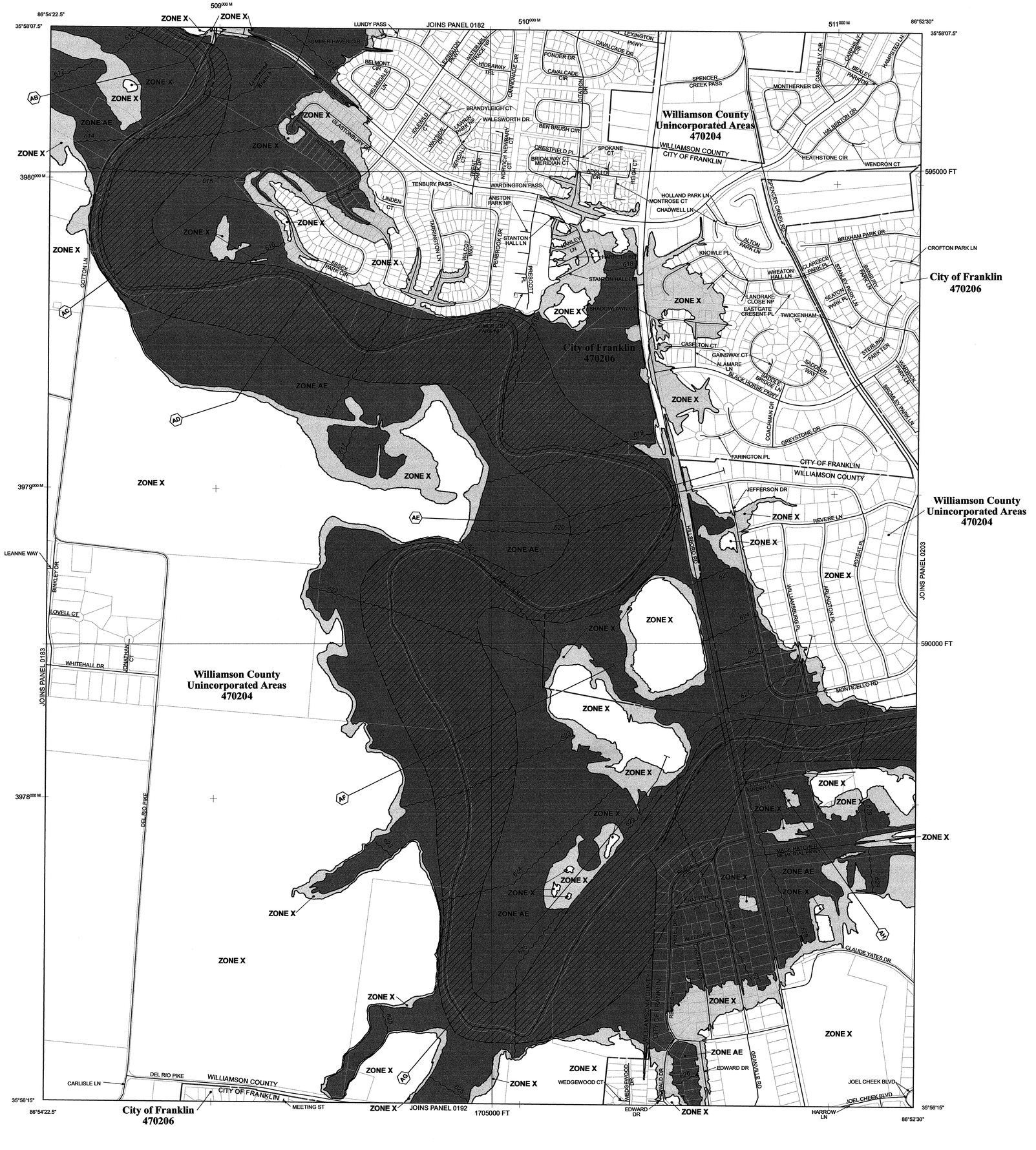

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevation determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance of greater flood event.

ZONE A99 Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A — Cross section line

23 — 23 — Transect line

97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

4275000 M
6000000 FT — 1000-meter Universal Transverse Mercator grid ticks, zone 16; 5000-foot grid values: Tennessee State Plane coordinate system (FIPSZONE = 4100), Lambert projection

DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
JANUARY 16, 2003

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
SEPTEMBER 29, 2006 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations and Special Flood Hazard Areas, to change Special Flood Hazard Areas, to add roads and road names, to reflect the incorporation of the Town of Nolensville, and the Town of Thompson's Station, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information, to add floodway, and to change floodway.

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To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0184F

FIRM

FLOOD INSURANCE RATE MAP
WILLIAMSON COUNTY, TENNESSEE
AND INCORPORATED AREAS

PANEL 184 OF 485

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FRANKLIN, CITY OF	470206	0184	F
WILLIAMSON COUNTY	470204	0184	F

BEST AVAILABLE COPY AT THIS TIME

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
47187C0184F

MAP REVISED
SEPTEMBER 29, 2006

Federal Emergency Management Agency

NOTES TO USERS

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Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' National Geodetic Vertical Datum of 1929 (NGVD 29). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

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Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Williamson County, Tennessee.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

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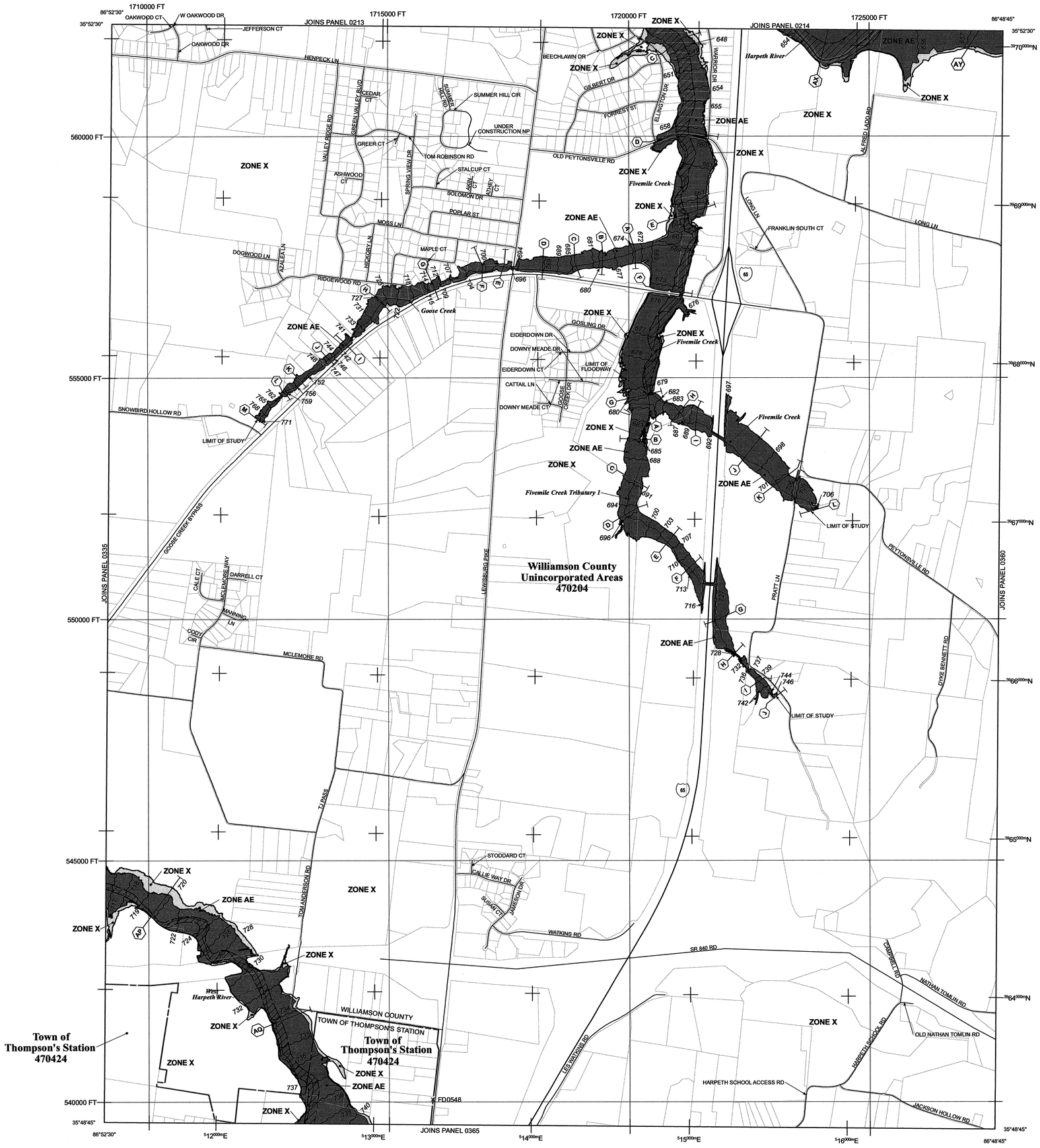

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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ZONE A	No Base Flood Elevation determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance of greater flood event.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

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- 23–23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4275000mE — 1000-meter Universal Transverse Mercator grid ticks, zone 16
- 6000000 FT — 5000-foot grid values: Tennessee State Plane coordinate system (FIPSZONE = 4100), Lambert projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

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EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
JANUARY 16, 2003

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
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MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0355F

FIRM

FLOOD INSURANCE RATE MAP
WILLIAMSON COUNTY, TENNESSEE
AND INCORPORATED AREAS

PANEL 355 OF 485
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
THOMPSON'S STATION, TOWN OF	470424	0355	F
WILLIAMSON COUNTY	470204	0355	F

BEST AVAILABLE COPY AT THIS TIME

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MAP NUMBER
47187C0355F

MAP REVISED
SEPTEMBER 29, 2006

Federal Emergency Management Agency

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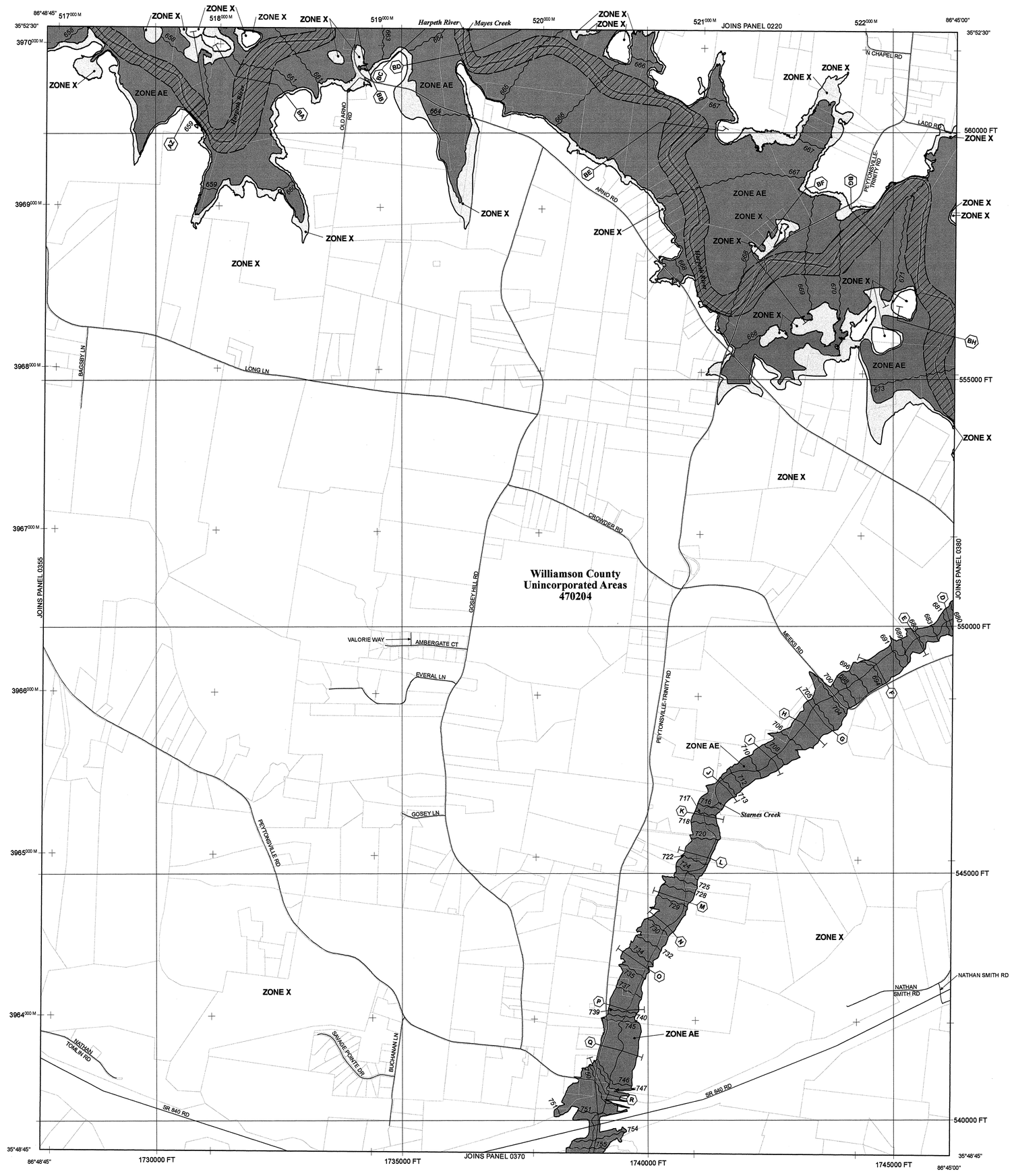

LEGEND

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ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
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OTHER FLOOD AREAS

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OTHER AREAS

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OTHERWISE PROTECTED AREAS (OPAs)

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	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
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M1.5	River Mile

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JANUARY 16, 2003

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
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500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0360F

FIRM

FLOOD INSURANCE RATE MAP
WILLIAMSON COUNTY, TENNESSEE
AND INCORPORATED AREAS

PANEL 360 OF 485

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
WILLIAMSON COUNTY	470204	0360	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
47187C0360F

MAP REVISED
SEPTEMBER 29, 2006

Federal Emergency Management Agency

ORDINANCE 2015-80
(AS AMENDED)

TO BE ENTITLED: "AN ORDINANCE TO AMEND THE ZONING ORDINANCE OF THE CITY OF FRANKLIN, TENNESSEE, TO UPDATE THE DEVELOPMENT STANDARDS AND SUB-DISTRICT BOUNDARIES FOR THE CAO-COLUMBIA AVENUE OVERLAY DISTRICT BY AMENDING CHAPTER 3, SUBSECTION 3.4.7."

WHEREAS, US Highway 31 has historically linked Nashville and Columbia and serves as an important historic and cultural resource; and

WHEREAS, significant military action took place during the Civil War along Columbia Avenue (US Highway 31) between Winstead Hill and Downtown Franklin; and

WHEREAS, the City of Franklin, Tennessee, desires compatible and high-quality development along this important gateway; and

WHEREAS, the City of Franklin, Tennessee, first approved design standards for Columbia Avenue on June, 21, 2005; and

WHEREAS, the design standards were incorporated into the 2008 Franklin Zoning Ordinance, and it is within the best interests of the citizens of the City of Franklin to amend the Franklin Zoning Ordinance to update the Columbia Avenue Overlay standards.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF MAYOR AND ALDERMEN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That Chapter 3, Section 3.4 Subsection 3.4.7 of the Franklin Zoning Ordinance is hereby amended to delete the following text noted with a ~~strikethrough~~; to add the following text noted in **bold**; to renumber the subsequent figures in Chapter 3 accordingly, and is approved to read as follows:

1.1.1 CAO—Columbia Avenue Overlay District

(1) Purpose

Columbia Avenue serves as an integral southern gateway into Franklin. The corridor contains many important historic sites and many longstanding commercial and industrial uses. The City seeks to preserve and enhance the cultural resources along this corridor while also facilitating new development that will improve the character and function of this corridor. ~~Columbia Avenue is experiencing development pressures that threaten the area's visual and historic integrity~~. The CAO District shall supplement the standards of the base districts and provide protective measures to preserve and enhance the character of Columbia Avenue. More specifically, the standards are intended to:

(a) Insure the compatibility of new buildings with respect to the specific character of their immediate context;

(b) Reinforce the historically urban character of the portion of Columbia Avenue between the Five Points area and the Carter House;

(c) Protect and enhance the economic viability of the corridor by promoting high-quality development;

(d) Minimize negative impacts of development on the corridor's remaining open space; and

(e) Enhance the quality of development surrounding historic and cultural resources.

(2) Establishment and Applicability

(a) These standards generally address properties fronting along the Highway 31/Columbia Avenue corridor beginning at the Five Points area, located on the southern edge of the historic downtown commercial core, with the southernmost limits of the city's Urban Growth Boundary (UGB). Properties subject to the standards of this overlay district shall be designated as the Columbia Avenue Overlay District, hereinafter referred to as the CAO District, on the zoning map.

(b) Development review for properties within the CAO District shall be subject to the standards of this district. The underlying base districts shall govern land use. In case of conflict with dimensional standards of the base district, the standards of the CAO District, and the development standards of Chapter 5: Development Standards, these standards shall control.

(c) For the purpose of this ordinance, the CAO district is hereby divided into five sub-districts as depicted on the following maps. ~~These maps are provided for reference purposes only, and in case of conflict between the map in this Subsection and the Official Zoning Map, the Official Zoning Map shall control.~~

Most of the parcels located in CAO 5 are not located within the City limits, but it is anticipated that properties will be zoned into the CAO 5 if and when annexation occurs.

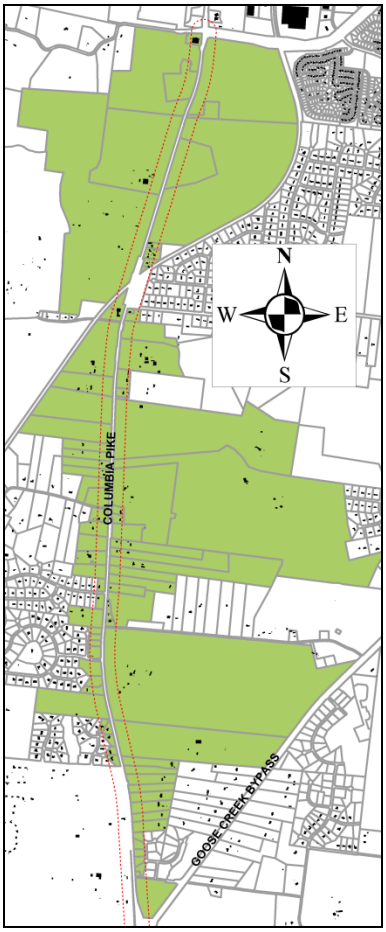
(3) General Development Standards

The following development standards shall apply to lots in all of the sub-districts of the CAO District:

(a) Parking and Access

(i) Surface parking spaces provided in excess of the minimum requirement established in Subsection 5.9.4, Off-street Parking Standards, shall be constructed of pervious materials. The Department of Planning and Sustainability shall only approve such additional spaces for overflow events, seasonal demands, and related reasons, based upon a demonstration of need by the applicant. However, such additional parking and access lanes shall use alternate pervious materials, such as grass or mulch-covered gridblocks, for the entire overflow area. Asphalt, concrete, crushed stone, and other impervious materials shall not be permitted for the entire overflow area.

(ii) Perimeter landscape is required for parking lots. A continuous perimeter planting strip with an average width of eight feet is required, or a five-foot-wide planting strip may be used, with the inclusion of either a three-foot opaque wall/fence or evergreen shrubs planted two and one-half to three feet tall so as to achieve a solid screen within three years. Canopy trees shall be planted at a maximum separation of 30 feet on-center.

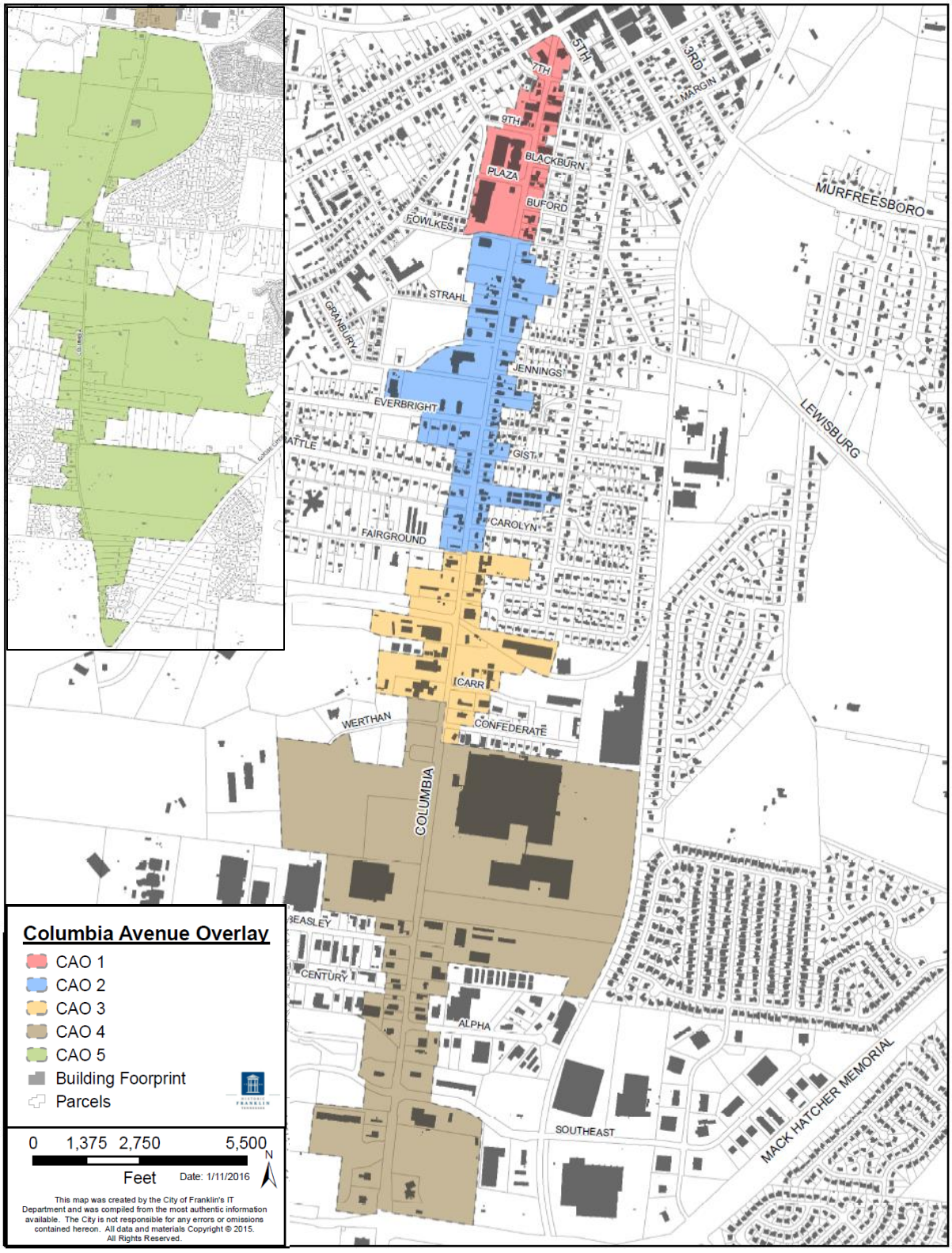


CAO 5 – Rural Gateway

(iii) All development shall be subject to the requirements in Chapter 5: Development Standards, related to landscape, street tree, and screening requirements unless otherwise noted.

(iv) Because cross-access is encouraged between adjacent commercial properties, parking lots for nonresidential developments that have direct access to a public street shall have at least one vehicular connection to adjacent properties unless deemed infeasible or inappropriate due to topography or other constraints. Lots in a HI District are exempt from the interconnectivity requirements.

Figure 3-1: CAO—Columbia Avenue Overlay Sub-Districts

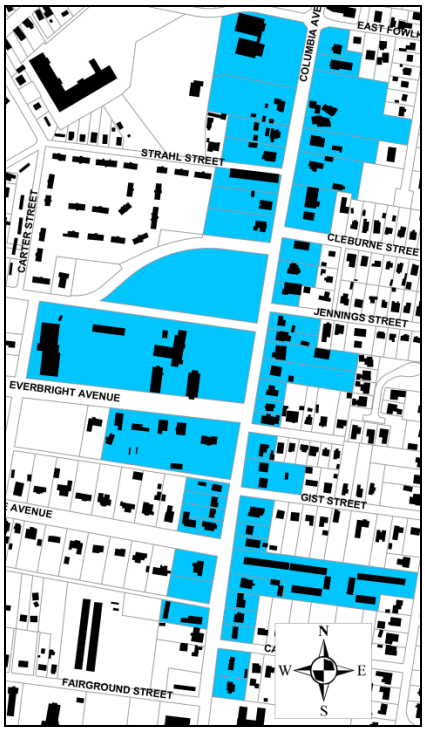


Law Dept. approved 06.22.16

~~CAO 1 – Urban Commercial~~

~~CAO 3 – Commercial Transition~~

~~CAO 2 – Historic Residential~~



~~CAO 4 – Suburban Commercial/Industrial~~

Law Dept. approved 06.22.16

(4) CAO 1—Urban Commercial Development Standards

(a) Area Description

This sub-district, which includes properties located between the Five Points area and East Fowlkes Street, is at the northernmost end of the study area and is directly connected to downtown. Contemporary strip commercial development, as well as pre-WWII and civic buildings, are present in this sub-district. **While many buildings do not have historic protections, there are several buildings that were constructed over 50 years ago.** While commercial structures are the predominant building type, two historic residential structures are also present. At the effective date of this ordinance, the sub-district is characterized by:

(i) ~~Primarily one-story buildings with a limited number of two story structures~~ **A mix of one and two-story buildings**;

(ii) A wide range of materials, including brick, aluminum siding, vinyl siding, and wood siding;

(iii) **Shallow front building setbacks with some** variation~~ in front and side building setbacks~~;

(iv) ~~A streetscape with narrow sidewalks, frequent curb cuts, and a lack of landscaping;~~ **Streetscape improvements were completed in 2010 providing a continuous sidewalk network on both sides of the street, access management, small-scale masonry signage, and landscaping enhancements.**

(v) ~~Excessive signage that is poorly located and designed.~~

~~**(b) Streetscape**~~

(i) ~~Sidewalks shall be required along public streets and shall have a minimum width of five feet, unobstructed by street trees, light poles, and similar features. Where such features block the sidewalk, a minimum sidewalk width of eight feet shall be required. To enhance pedestrian safety, a minimum strip of three and one half feet wide shall be provided from the edge of curb and shall contain pavers, sod, mulch, annuals, or low-growing shrubs.~~

(ii) ~~A combination of concrete and brick pavers shall be used for the construction of new sidewalks.~~

(iii) ~~For properties within the Franklin Gateway Corridors and Connector Streets Project (Franklin Streetscape Program), the adopted streetscape plan for those parcels shall govern.~~

(iv) ~~Street trees should be installed in "plant wells" with tree grates and properly designed drainage and irrigation systems. Street trees shall be planted a minimum of 40 feet on center and shall be a minimum of three and one-half inch caliper and 14 to 16 feet in height at the time of installation. Specific spacing of trees should be determined on a block-by-block case based on existing features such as building façades. Shade trees forming a canopy are recommended.~~

(v) ~~If existing cobra-head streetlights are removed, decorative replacement lighting shall be installed and may range between 16 and 20 feet in height. If the cobra head streetlights are not removed, supplemental decorative lights shall be installed but shall not exceed 14 feet in height.~~

(vi) ~~Pedestrian crossings should be clearly delineated through the use of a different pavement color and texture.~~

(c) Building Heights, Massing, and Orientation

(i) Buildings shall be aligned parallel to Columbia Avenue with the main entrance facing the street. Corner entrances are an acceptable alternative for corner buildings.

(ii) ~~**Buildings shall be built to the sidewalk.**~~ **Buildings shall have front setbacks of 5 to 10 feet from the back of the sidewalk**. ~~**Buildings along West Fowlkes Street shall have a minimum setback of 25 feet to provide a transition to the less intensive land uses and historic resources directly to the south.**~~ Institutional uses are permitted to have a variable front building setback from ~~zero~~**5** to 40 feet from the back of the sidewalk to signify and reinforce their prominent role in the urban fabric and to afford additional safety.

(iii) Buildings **fronting Columbia Avenue and East and West Fowlkes Street** shall not exceed two stories ~~or a maximum height of 35 feet~~. A maximum height limit of three stories~~, not to exceed a total height of 42 feet,~~ is permitted **for buildings internal to the site (not along Columbia Avenue or East and West Fowlkes Street)** in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.

(iv) ~~The maximum linear length of an uninterrupted facade plane shall be 35 feet.~~ Building wall offsets (projections and recesses) or pilasters shall be used to break up the mass of a single building into bays. Variations in roofline, materials, and color may also be used to break up massing.

Figure 3-2: **The rendering shows the Hill Center in Sylvan Park and serves as an example of having a taller building internal to the site.**

(v) To better replicate the historic urban fabric of Columbia Avenue, new buildings in this sub-district shall be designed to ~~either~~ **the following standards:**

~~A.) Differentiate, at a minimum, their Columbia Avenue façades every 100 feet or less of linear frontage so as to replicate the historic "rhythm" of building front widths along the street; or~~
Differentiate the Columbia Avenue facades so as to replicate the historic rhythm of building front widths along the street. For one-story buildings, a different façade treatment shall be provided every 50 feet or less of linear frontage along Columbia Avenue. For two story buildings, a different façade treatment shall be provided every 100 feet or less of linear frontage along Columbia Avenue.

~~B.) Have a maximum building width not exceeding 100 feet fronting Columbia Avenue. Irrespective of property lines, a new building shall be separated at least 15 feet, but no greater than 40 feet, from adjacent proposed or existing buildings. Between the buildings, pedestrian-scale lighting and formal open space shall be provided, as identified in Chapter 5: Development Standards.~~

Figure ~~3-2~~ 3-3: Examples of buildings having a different façade treatment every 100 feet or less to replicate the historic character of other buildings in the area.

(d) Roofs

(i) ~~For commercial-type buildings,~~ **For non-residential, mixed-use, and attached residential buildings,** flat roofs or roofs with parapet walls shall be the predominant roof form.

(ii) Buildings with a residential character shall employ either gable, hipped, or pyramidal roofs having a slope between 5:12 and 12:12. Sloped roofs shall include overhanging eaves that extend a minimum of one foot beyond the building wall.

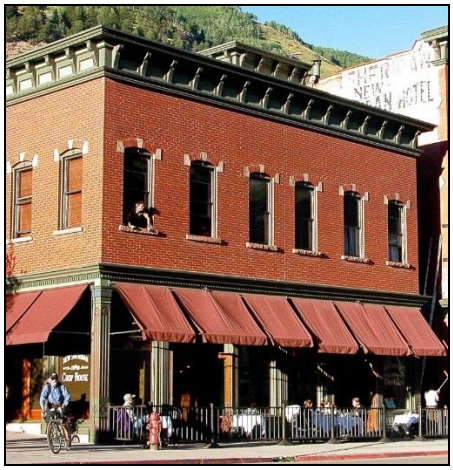


Figure ~~3-3~~ 3-4: Example of a flat roof with parapet walls, which should be the predominant roof type for commercial buildings in CAO 1, CAO 3, and CAO 4.

(e) Façades

(i) Façades of buildings shall emphasize clearly identified main entrances using awnings, canopies, columns, pilasters, and recessed entrances. Storefronts shall be integrally designed with the upper floors of a building to be compatible with the overall character of the façade.

(ii) Window and door openings shall have a vertical orientation and alignment between floors. **Faux windows, reflective glass, and tinted glass shall be prohibited.**

(iii) Blank walls facing streets shall be prohibited.

(iv) Commercial, office, institutional, and mixed-use buildings shall have a discernible base and cap that are clearly defined by horizontal elements along the bottom and top of the building. Elements to achieve this standard include water tables, storefront "kick-plates," stringcourses, corbelling, and material changes.

Figure ~~3-4~~ 3-5: ~~Example of with a building~~ **Examples of buildings in CAO 1** with a discernible base and cap.

(v) For two **and three**-story commercial, office, institutional, and mixed-use buildings, **a minimum of 60** ~~65 to 85~~ percent of the first floor shall be glazed, while 35 to **60** ~~65~~ percent of the façade area on upper floors shall be glazed, exclusive of the parapet wall. For one-story commercial or office buildings, **60** ~~65~~ to 85 percent of the front façade shall be glazed, exclusive of the parapet wall. Reflective glass or tinted glass shall be prohibited.

(vi) For buildings having a residential character, a minimum of 25 percent of the façade area shall be covered with window and door openings. ~~Storefronts with generous amounts of window and door transparency properly located and proportioned animate the streetscape by providing visual interest for pedestrians.~~

(vii) **Internally illuminated signs attached to the building shall only be allowed on the façade facing Columbia Avenue**

(f) Building Materials

(i) For commercial, office, institutional, and mixed-use buildings, brick or stone shall comprise a minimum of 75 percent of the primary building materials. For accent purposes, stone, cast stone, cement-based stucco**,** and split-faced concrete block shall be permitted.

(ii) ~~For residential buildings, either brick, wood siding, or fibrous cement siding that closely resembles wood siding, shall comprise at least 50 percent of the primary building material. Cast stone, stone, and cementitious materials shall be permitted and are encouraged as accents to the primary building material.~~

(iii) ~~Vinyl, aluminum siding, Exterior Insulation Finish Systems (referred to as EIFS), and smooth-face block, and other synthetic materials shall be prohibited.~~

(g) Parking and Access

(i) Off-street parking areas are prohibited between the building and Columbia Avenue.

(ii) A maximum of 25 percent of the parking spaces may be located along the side of the building.

(iii) To the maximum extent practicable, access to commercial uses shall be provided from side streets.

(iv) Rear access from Cummins Street shall be required on the east side of Columbia Avenue.

(v) Driveway-width curb radii for access shall be kept to a minimum to facilitate pedestrian traffic.

(vi) ~~Developments shall be limited to no more than one access driveway unless a traffic report verifies the justification for an additional access point.~~

(vii) Where parking abuts the public right-of-way, a three-foot-high masonry wall, designed to complement the building, fence, or evergreen shrubs, may be installed in lieu of the opaque screen required by Section 5.4, Landscape, Buffers, and Screening.

(viii) **Where a nonresidential use or parking serving a nonresidential use is adjacent to or across the street from a residential use, a six foot masonry wall shall be installed.**

~~Parking lots shall be screened and landscaped pursuant to Chapter 5: Development Standards.~~

(5) CAO 2—Historic Residential Development Standards

(a) Area Description

Pre-WWII residential structures are the primary building type in this sub-district located between East Fowlkes and Fairground Streets. **Institutional buildings, strip commercial development, and reclaimed battlefield open space are** interspersed with ~~the~~ residential structures. ~~are institutional buildings (Boys and Girls Club and Battle Ground Academy) and strip commercial development.~~ While many of the residential structures are still used as homes, some now function as offices, small retail businesses, and museums (Carter House and Lotz House). ~~The properties that are located north of Jennings Street (east side of Columbia Avenue) and Granbury Street (west side of Columbia Avenue) are zoned GC, while the properties to the south of these streets are zoned R-3.~~ The physical development form in this sub-district is characterized by:

(i) One and two-story residential structures and one-story commercial buildings;

(ii) The use of brick and wood siding as the primary building materials;

(iii) **Most** front building setbacks range between 15 and 75 feet; and

(iv) Sidewalks located directly adjacent to the street that do not extend the entire length of the sub-district.

(b) Streetscape

(i) ~~Sidewalks and street trees shall be provided as required by Chapter 5: Development Standards.~~

(ii) ~~Sidewalks shall have a minimum width of five feet.~~

(iii) There shall be a planting strip with a minimum width of six feet between the curb of the street and the sidewalk.

Figure ~~3-5~~ 3-6: Illustration of planting strips required within CAO 2.

(iv) Sidewalks shall be constructed of concrete.

(v) Street trees shall be installed in the planting strip located between the street and the sidewalk. Trees shall be planted in accordance with Subsection 5.4.8, Street Trees. Additional right-of-way may be needed to accommodate the planting strip.

(vi) Pedestrian street crossings shall be provided and clearly delineated through the use of a different pavement color and texture.

Figure ~~3-6~~ 3-7: Example of a cross walk constructed of stenciled concrete. Pedestrian cross walks constructed of stenciled concrete, or an approved equivalent, enhance historic character CAO 2 and serve as a traffic-calming measure.

(c) Building Heights, Massing, and Orientation

(i) Buildings shall not exceed two stories~~, or a maximum height of 35 feet. A maximum height limit of three stories, not to exceed a total height of 42 feet, is permitted in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.~~

(ii) Buildings **on the east side of Columbia Ave shall have a minimum setback of** ~~may be set back from between 15~~ **40** ~~to 50~~ feet from the right-of-way. **Buildings on the west side of Columbia Avenue shall have a minimum setback of 30 feet from the right-of-way. No new structure shall be closer to the right-of-way than the closest existing principal structure.** ~~However, in locations adjacent to historic structures that contribute to historic character in CAO 2, new building setbacks shall not deviate more than 25 percent from the average building setback as measured from the closest historic structures immediately adjacent to and on the same side of the street as the proposed new building.~~

(iii) The front façade maximum building width shall not exceed 45 feet.

Figure 3-8: **Four single-family homes have a consistent front setback along Columbia Ave. The new building, part of General's Retreat, breaks the consistent development pattern.**

(d) Roofs

Main roofs shall be gables or hips with a slope between 5:12 and 12:12 and shall have overhanging eaves on all sides that extend a minimum of one foot beyond the building wall.

Figure ~~3-7~~ 3-9: Example of a gabled roof with overhanging eaves as required in CAO 2.

(e) Façades

(i) Façades of buildings housing nonresidential uses shall be configured to resemble residential building types.

(ii) Buildings shall have front porches with a minimum depth of six feet.

(iii) Window and door openings shall cover a minimum of 25 percent of the façade area.

(iv) Window and door openings shall have a vertical orientation and vertical alignment.

(v) Raised foundations shall be required with an elevation a minimum of 18 inches above the finished grade.

(vi) **No internally illuminated signs shall be allowed.**

Figure 3-~~8~~ 3-10: This house demonstrates vertically oriented windows, a raised foundation, and a front porch consistent with existing historic homes in CAO 2.

(f) Exterior Building Materials

(i) ~~The base of buildings shall be of masonry materials. Primary façade materials shall not change at outside corners.~~

(ii) ~~Material changes shall occur along a horizontal line or where two forms intersect. One exception is that a change of materials may occur as accents around windows, at corners, or as a repetitive pattern, such as quoining.~~

(iii) **Brick**, wood siding or fibrous cement siding that closely resembles wood siding shall **be** ~~comprise at least 50 percent of~~ the primary building material. Cast stone, stone, and cementitious materials shall be permitted, and are encouraged, to accent the primary building material.

(iv) ~~Vinyl, aluminum siding, EIFS, and smooth-face block, and other synthetic materials shall be prohibited.~~

(g) Parking and Access

(i) Off-street parking areas shall not be located between the building and **Columbia Avenue** ~~any public street~~.

(ii) **A maximum of 25 percent of the parking spaces may be located along the side of the building.** ~~Parking is permitted on the side of the building, provided the parking complies with the landscaping and screening standards of Chapter 5: Development Standards~~.

(6) CAO 3—Commercial Transition Development Standards

(a) Area Description

The strip commercial development that extends north and south from the intersection of Downs Boulevard and Columbia Avenue comprises CAO 3. ~~These properties, along with CAO 1, anchor both ends of the residential portion of the Columbia Avenue corridor (CAO 2).~~ The intent of these standards is to create a more pedestrian-oriented commercial node that is complimentary to the adjacent residential development. Many of the standards developed for these properties will be similar to CAO 1. On the effective date of this ordinance, this sub-district was characterized by:

(i) One-story buildings;

(ii) A wide range of materials, including stucco, concrete block, pre-fabricated metal panels, and vinyl siding;

(iii) Excessive building setbacks with parking in front;

(iv) A streetscape with continuous curb cuts and no sidewalks or landscaping; and

(v) Excessive signage that is poorly located and designed.

(b) Streetscape

(i) ~~Sidewalks and street trees shall be provided as required by Chapter 5: Development Standards.~~

(ii) ~~Sidewalks shall have a minimum width of five feet.~~

(iii) There shall be a planting strip with a minimum width of six feet between the curb of the street and the sidewalk.

(iv) Street trees shall be installed in the planting strip located between the street and the sidewalk. Trees shall be planted a minimum of 30 feet on-center and shall be a minimum of **two** ~~three~~ and one-half-inch caliper and 14 to16 feet in height at installation.

(v) If existing cobra-head streetlights are removed, decorative replacement lighting shall be installed and may range between 16 and 20 feet in height. If the cobra-head streetlights are not removed, supplemental decorative lights shall be installed but shall not exceed 14 feet in height.

(vi) Pedestrian crossings shall be clearly delineated through the use of a different pavement color and texture.

(c) Building Heights, Massing, and Orientation

(i) Buildings shall be aligned parallel to Columbia Avenue with the main entrance facing the street. Corner entrances are an acceptable alternative for corner buildings.

(ii) Buildings **shall have a minimum setback of 15 feet from the dedicated right-of-way** ~~can be built to the back of the sidewalk but may have a variable front building setback of zero to 40 feet from the sidewalk~~.

(iii) ~~Parking shall be located to the side or rear of the structure~~.

(iv) Buildings shall not exceed two stories ~~or a maximum height of 35 feet. A maximum height limit of three stories, not to exceed a total height of 42 feet, is permitted in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.~~

(v) ~~The maximum linear length of an uninterrupted façade plane shall be 35 feet.~~ Building-wall offsets (projections and recesses) or pilasters shall be used to break up the mass of a single building into bays. Variations in roofline, materials, and color may also be used to break up massing.

(vi) ~~To better replicate the previous urban fabric of Columbia Avenue, new buildings shall be designed to either:~~

~~A.) Differentiate, at a minimum, their Columbia Avenue façades every 100 feet or less of linear frontage so as to replicate the historic rhythm of building-front widths along the street (See Figure 3-2.); or~~

~~B.) Have a maximum building width not exceeding 100 feet fronting Columbia Avenue. Irrespective of property lines, a new building shall be separated at least 15 feet, but no greater than 40 feet, from adjacent proposed or existing buildings. Between the buildings, pedestrian-scale lighting and formal open space shall be provided as identified in Chapter 5, Development Standards.~~

(d) Roofs

(i) For commercial-type buildings, flat roofs or roofs with parapet walls shall be the predominant roof form.

(ii) Buildings with a residential character shall employ either gable, hipped, or pyramidal roofs having a slope between 5:12 and 12:12. Sloped roofs shall include overhanging eaves that extend a minimum of one foot beyond the building wall.

(e) Façades

(i) Façades of buildings shall emphasize clearly identified main entrances using awnings, canopies, columns, pilasters, and recessed entrances. Storefronts shall be integrally designed with the upper floors of a building to be compatible with the overall character of the facade.

(ii) Window and door openings shall have a vertical orientation and alignment between floors.

(iii) Blank walls facing streets shall be prohibited.

(iv) Commercial, office, institutional, and mixed-use buildings shall have a discernible base and cap clearly defined by horizontal elements along the bottom and top of the building. Elements to achieve this standard include water tables, storefront kick-plates, stringcourses, corbelling, and material changes.

(v) For two-story commercial, office, institutional, and mixed-use buildings, 65 to 85 percent of the first floor shall be glazed, while 35 to 65 percent of the façade area on upper floors shall be glazed exclusive of the parapet wall. **Faux windows shall be prohibited.** For one-story commercial or office buildings, **60** ~~65~~ to 85 percent of the front façade shall be glazed, exclusive of the parapet wall. Reflective or tinted glass shall be prohibited on the first floor.

(vi) For buildings having a residential character, a minimum of 25 percent of the façade area shall be covered with window and door openings. Storefronts with generous amounts of window and door transparency properly located and proportioned animate the streetscape by providing visual interest for pedestrians.

(f) Building Materials

(i) ~~For commercial, office, institutional, and mixed-use buildings, brick or stone shall comprise a minimum of 75 percent of the primary building materials. For accent purposes, stone, cast stone, cement-based stucco, and split-faced concrete block shall be permitted.~~

(ii) For residential buildings, either brick, wood siding, or fibrous cement siding that closely resembles wood siding, shall **be** ~~comprise at least 50 percent of~~ the primary building material. Cast stone, stone, and cementitious materials shall be permitted, and are encouraged as accents to the primary building material.

(iii) ~~Vinyl, aluminum siding, EIFS, and smooth-face block, and other synthetic materials shall be prohibited.~~

(g) Parking and Access

(i) Off-street parking areas are prohibited from being located between the building and any public street.

(ii) **Drive-through uses are prohibited on properties north of Downs Boulevard to create a pedestrian-oriented node.**

(iii) A maximum of 25 percent of the parking spaces may be located along the side of the building.

(iv) ~~Where parking abuts the public right-of-way, a three-foot-high masonry wall, designed to complement the building, a fence, or evergreen shrubs may be installed in lieu of the opaque screen required by Section 5.4, Landscape, Buffers, and Screening.~~

(v) ~~Parking lots shall be screened and landscaped pursuant to Chapter 5: Development Standards.~~

(7) CAO 4—Suburban Commercial/Industrial Development Standards

(a) Area Description

Light industrial, offices, **and** retail, ~~and agricultural~~ are the primary land uses in this sub-district, which extends from roughly Carr Avenue to Mack Hatcher Parkway. Although there is no cohesiveness to building design, on the effective date of this ordinance, the physical development form in this sub-district was characterized by:

(i) One and two-story buildings with large footprints;

(ii) A wide range of materials, including aluminum siding, brick, and pre-cast concrete panels;

(iii) Deep front setbacks with parking located in front of buildings; and

(iv) A streetscape with no sidewalks or street trees.

(b) Streetscape

(i) ~~Sidewalks and street trees shall be provided as required by Chapter 5: Development Standards.~~

(ii) ~~Sidewalks shall have a minimum width of five feet.~~

(iii) ~~There shall be a planting strip with a minimum width of five feet, but preferably eight feet, between the curb of the street and the sidewalk.~~

(iv) Street trees shall be installed in the planting strip located between the street and the sidewalk. Trees shall be planted a minimum of 40 feet on-center and shall be a minimum of **two** ~~three~~ and one-half-inch caliper and 14 to 16 feet in height at installation.

(v) **Existing stonewalls shall be preserved, or if necessary, shall be relocated to another location in the CAO District.**

(c) Building Heights, Massing, and Orientation

Building heights and setbacks shall comply with the site development requirements of the underlying base district.

(d) Roofs

(i) ~~Roofs shall be appropriate to a building's architecture.~~

(ii) For commercial-type buildings, flat roofs or roofs with parapet walls shall be the predominant roof form.

(e) Façades

Façades shall incorporate a minimum of 20 percent glazing along the front facade of the building.

~~**(f) Exterior Building Materials**~~

(i) ~~The base of buildings shall be of masonry materials. Primary façade materials shall not change at outside corners.~~

(ii) ~~Material changes shall happen along a horizontal line or where two forms intersect. One exception is that a change of materials may occur as accents around windows, at corners, or as a repetitive pattern, such as quoining.~~

(iii) ~~Standard smooth-face concrete block shall be prohibited.~~

(iv) ~~EIFS may be used above six feet from grade~~.

~~**(g) Parking**~~

~~See Chapter 5: Development Standards.~~

(8) CAO 5—Rural Gateway Development Standards

(a) Area Description

This sub-district, in the southern portion of Franklin's Urban Growth Boundary (UGB), has a rural character, with large lots and significant amounts of vacant land. Reinforcing its rural character, this portion of the corridor becomes known as Columbia Pike south of Mack Hatcher Parkway. Columbia Pike serves as a southern gateway into the city, with its rural character that is important to the image of the community, particularly given its historic significance. Some parcels within this corridor contain forested areas, tree rows, hillcrests, hillsides, and steep slopes (greater than 20 percent). Residential development is occurring in subdivisions of one-acre lots or larger to accommodate the required on-site sewage treatment; however, this trend is viewed by many residents as sprawl and an undesirable trend for continuation. To stop and reverse this trend, and for the appealing rural and agrarian character of this sub-district to be maintained, future development ~~should~~ **shall** be substantially set back from Columbia Pike, with an emphasis on the preservation of substantial tracts of open space along this corridor.

(b) Columbia Pike Buffer

Within a 20-foot buffer measured from the right-of-way of Columbia Pike:

(i) The buffer shall contain at least two canopy trees per 100 linear feet of the frontage along the public right-of-way. Where canopy trees will conflict with overhead utilities, understory trees shall be used.

(ii) A fence or a wall shall be constructed. Fences and walls shall be constructed of durable and natural materials to allow for natural weather processes and reduced maintenance. Walls shall be constructed of natural stone in the dry-stack method or without mortar, and shall be a minimum of three feet in height. (See Figure 3-12.) Cultured stone shall not be used. Fences shall be a four-board horse fence, a minimum of four feet in height, constructed of wood, and painted black. (See Figure 3-11.) Vinyl fencing is prohibited in this buffer yard. The Department of Planning and Sustainability may approve other colors or types of fences, such as picket, split rail, wrought iron, or brick walls, if the applicant demonstrates that such a fence or wall is better suited to the portion of the CAO District in which it is proposed. A fence or wall shall not be required if, in the opinion of the Department of Planning and Sustainability, based on steep slopes, floodplain, existing vegetation, or other topographical constraints, the fence or wall would serve no meaningful purpose or may cause adverse environmental impacts.

(c) Building Placement in New Development

To maintain the existing rural character of Columbia Pike, new development, regardless of land use, shall ~~either~~ face Columbia Pike and be set back from the right-of-way at least 250 feet., ~~or be designed according to at least one of the following options:~~

(i) ~~In cases in which existing smaller lot sizes make compliance with the 250-foot setback impossible, additional screening and landscaping shall be used to mitigate the impacts of having buildings located closer to the street. The additional screening shall include a 30-foot-wide linear-form buffer adjacent to the right-of-way of Columbia Pike. The intent of the additional screening shall be to completely obscure building encroachment within the 250-foot setback from view from the Columbia Pike corridor by a densely planted buffer. Plantings within the buffer shall be in accordance with Subsection 3.4.7 (8)(b).~~

(ii) ~~Linear open space 250 feet deep, or greater, measured from the right-of-way of Columbia Pike, shall separate the buildable lots located on the interior of the development from Columbia Pike. Furthermore, a 30-foot-wide landscaped buffer, designed according to Subsection 3.4.7(8)(b), shall be provided as closely as possible to the buildable lots to completely obscure the new development from view from Columbia Pike.~~

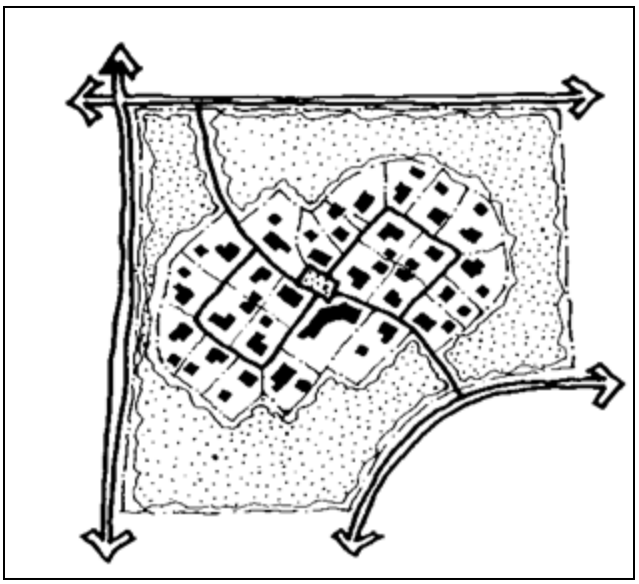


Figure 3-~~9~~ 3-10: Appropriate Development Example—Buildable lots located within the interior of a development shall be set back from the Columbia Avenue right-of-way in accordance with Subsection 3.4.7(8).

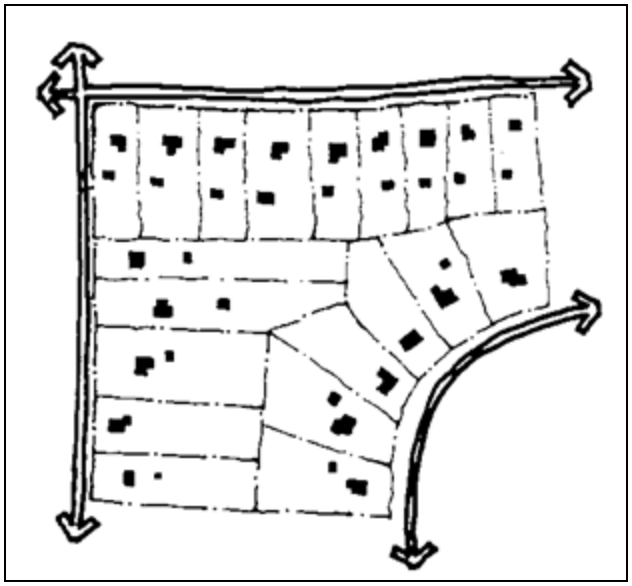


Figure 3-~~10~~ 3-11: Inappropriate Development Example—New development is prohibited from being located within 250 feet of the Columbia Avenue right-of-way ~~unless otherwise exempted or buffered according to the standards this subsection~~.

(d) Streetscape

(i) To maintain the sub-district's rural character, sidewalks and street trees shall not be required along Columbia Avenue**.**

(ii) **Compliance with the City's approved Parks Masterplan and Greenways and Open Space Plan is required.**

(iii) **Historically based fences, such as rail and board fences, and low, dry-stacked stone walls, may be included in the buffer and are encouraged. Stone walls shall be consistent in design and stone type with historic precedents found in the county. If a stone wall is used, the shrub requirement for the buffer shall be waived.**

~~**(e) Rural Gateway Buffer**~~

~~When new buildings will not face Columbia Pike and be set back from the right-of-way at least 250 feet, the following standards shall apply for the Rural Gateway Buffer used to obscure the development from Columbia Pike:~~

(i) ~~A minimum of 12 trees and 40 shrubs per 100 linear feet of street frontage shall be provided.~~

(ii) ~~No parking areas or structures shall be permitted within the buffer, and the buffer shall not be disturbed for any reason except as permitted within buffers by Section 5.4, Landscape, Buffers, and Screening.~~

(iii) ~~The plants shall be from the approved plant list as maintained by the Department of Planning and Sustainability; however, species indigenous to the area are suggested to provide a natural appearance.~~

(iv) ~~Tree spacing shall be random and not in uniform rows.~~

(v) ~~Shrubs and trees shall be planted in the buffer in accordance with the following ratios:~~

~~A.) At least 25 percent of the shrubs shall be evergreen shrubs;~~

~~B.) At least 40 percent of the trees shall be canopy trees; and~~

~~C.) At least 25 percent of the trees shall be understory trees.~~

(vi) ~~Contemporary man-made features, such as berms, shall not be used for screening.~~

(vii) ~~To prevent the harmful consequences of a monoculture, no more than 40 percent of any one genus of trees and shrubs shall be included in any planting.~~

(viii) ~~Historically based fences, such as rail and board fences, and low, dry-stacked stone walls, may be included in the buffer and are encouraged. Stone walls shall be consistent in design and stone type with historic precedents found in the county. If a stone wall is used, the shrub requirement for the buffer shall be waived.~~

(ix) ~~Where adjacent properties have been developed according to this standard, or where existing vegetation exists, the buffer shall connect to such vegetation to give the appearance of an existing farm field boundary.~~

Figure ~~3-11~~ 3-13: Black four-board horse fences are allowed in CAO 5.

Figure ~~3-12~~ 3-14: Stone walls ~~are allowed~~ **shall be preserved** in CAO 5.

(f) Building Heights

Buildings shall not exceed two stories ~~or a maximum height of 35 feet~~. A maximum height limit of three stories, ~~not to exceed a total height of 42 feet,~~ is permitted in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.

(g) Roofs

(i) For commercial-type buildings, flat roofs or roofs with parapet walls shall be the predominant roof form.

(ii) Buildings with a residential character shall employ either gable, hipped or pyramidal roofs having a slope between 5:12 and 12:12. Sloped roofs shall include overhanging eaves that extend a minimum of one foot beyond the building wall.

(h) Façades

(i) Façades of buildings shall emphasize clearly identified main entrances using awnings, canopies, columns, pilasters, and recessed entrances. Storefronts shall be integrally designed with the upper floors of a building to be compatible with the overall character of the facade.

(ii) ~~Window and door openings shall have a vertical orientation and alignment between floors.~~

(iii) ~~Blank walls facing streets shall be prohibited.~~

(iv) ~~Commercial, office, institutional, and mixed-use buildings shall have a discernible base and cap that are clearly defined by horizontal elements along the bottom and top of the building. Elements to achieve this standard include water tables, storefront kick-plates, string courses, corbelling, and material changes.~~

(v) ~~For two-story commercial, office, institutional, and mixed-use buildings, 65 to 85 percent of the first floor shall be glazed, while 35 to 65 percent of the façade area on upper floors shall be glazed, exclusive of the parapet wall. For one-story commercial or office buildings, 65 to 85 percent of the front façade shall be glazed, exclusive of the parapet wall. Reflective or tinted glass shall be prohibited.~~

(vi) For buildings having a residential character, a minimum of 25 percent of the façade area shall be covered with window and door openings. Storefronts with generous amounts of window and door transparency properly located and proportioned animate the streetscape by providing visual interest for pedestrians.

Figure ~~3-13~~ 3-15: The homes shown above are located in Harlinsdale Manor and serve as a good example of architectural style and character that would be appropriate in CAO 5.

(i) Building Materials

(i) ~~For commercial, office, institutional, and mixed-use buildings, brick or stone shall comprise a minimum of 75 percent of the primary building materials. For accent purposes, stone, cast stone, cement-based stucco, and split-faced concrete block shall be permitted.~~

(ii) For residential buildings, either brick, wood siding, or fibrous cement siding that closely resembles wood siding, shall **be** ~~comprise at least 50 percent of~~ the primary building material. Cast stone, stone, and cementitious materials shall be permitted and are encouraged as accents to the primary building material.

(iii) ~~Vinyl, aluminum siding, EIFS, and smooth-face block, and other synthetic materials shall be prohibited.~~

(j) Parking and Access

(i) ~~Off-street parking areas are prohibited from being located between the building and any public street.~~

(ii) Parking shall not be permitted between the building facade and Columbia Avenue, regardless of the building's setback, ~~unless a 30-foot buffer designed in accordance with Subsection 3.4.7(8)(e), Rural Gateway Buffer, is provided around the entire parking lot, except where the parking is contiguous to a building.~~

(iii) Parking is permitted on the side **and rear** of the building, provided that it complies with the landscaping and screening standards of Chapter 5: Development Standards.

SECTION II. BE IT FINALLY ORDAINED by the Board of Mayor and Aldermen of the City of Franklin, Tennessee, that this Ordinance shall take effect from and after its passage on third and final reading, the health, safety, and welfare of the citizens requiring it.

ATTEST:

By: _____

Eric Stuckey
City Administrator/Recorder

CITY OF FRANKLIN, TENNESSEE:

By: _____

Dr. Ken Moore
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

PLANNING COMMISSION RECOMMENDED: _____

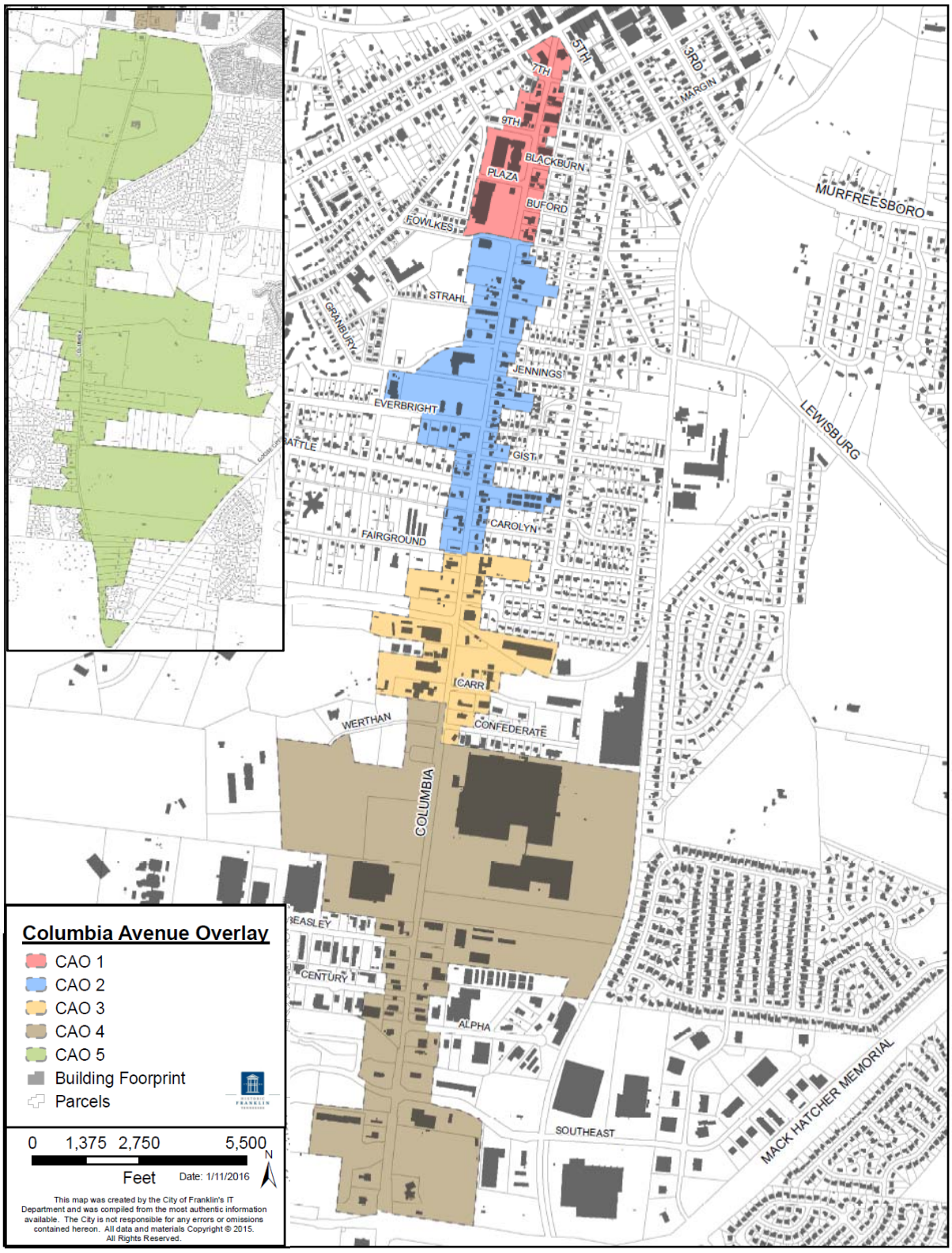
PASSED FIRST READING: _____

PUBLIC HEARING HELD: _____

PASSED SECOND READING: _____

PASSED THIRD READING: _____

Columbia Avenue Overlay Sub-Districts



ORDINANCE 2015-80
(As Amended by the Franklin Municipal Planning Commission)

TO BE ENTITLED: "AN ORDINANCE TO AMEND THE ZONING ORDINANCE OF THE CITY OF FRANKLIN, TENNESSEE, TO UPDATE THE DEVELOPMENT STANDARDS AND SUB-DISTRICT BOUNDARIES FOR THE CAO-COLUMBIA AVENUE OVERLAY DISTRICT BY AMENDING CHAPTER 3, SUBSECTION 3.4.7."

WHEREAS, US Highway 31 has historically linked Nashville and Columbia and serves as an important historic and cultural resource; and

WHEREAS, significant military action took place during the Civil War along Columbia Avenue (US Highway 31) between Winstead Hill and Downtown Franklin; and

WHEREAS, the City of Franklin, Tennessee, desires compatible and high-quality development along this important gateway; and

WHEREAS, the City of Franklin, Tennessee, first approved design standards for Columbia Avenue on June, 21, 2005; and

WHEREAS, the design standards were incorporated into the 2008 Franklin Zoning Ordinance, and it is within the best interests of the citizens of the City of Franklin to amend the Franklin Zoning Ordinance to update the Columbia Avenue Overlay standards.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF MAYOR AND ALDERMEN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That Chapter 3, Section 3.4 Subsection 3.4.7 of the Franklin Zoning Ordinance is hereby amended to delete the following text noted with a ~~strikethrough~~; to add the following text noted in **bold**; to renumber the subsequent figures in Chapter 3 accordingly, and is approved to read as follows:

1.1.1 CAO—Columbia Avenue Overlay District

(1) Purpose

Columbia Avenue serves as an integral southern gateway into Franklin. The corridor contains many important historic sites and many longstanding commercial and industrial uses. The City seeks to preserve and enhance the cultural resources along this corridor while also facilitating new development that will improve the character and function of this corridor. ~~Columbia Avenue is experiencing development pressures that threaten the area's visual and historic integrity~~. The CAO District shall supplement the standards of the base districts and provide protective measures to preserve and enhance the character of Columbia Avenue. More specifically, the standards are intended to:

(a) Insure the compatibility of new buildings with respect to the specific character of their immediate context;

(b) Reinforce the historically urban character of the portion of Columbia Avenue between the Five Points area and the Carter House;

(c) Protect and enhance the economic viability of the corridor by promoting high-quality development;

(d) Minimize negative impacts of development on the corridor's remaining open space; and

(e) Enhance the quality of development surrounding historic and cultural resources.

(2) Establishment and Applicability

(a) These standards generally address properties fronting along the Highway 31/Columbia Avenue corridor beginning at the Five Points area, located on the southern edge of the historic downtown commercial core, with the southernmost limits of the city's Urban Growth Boundary (UGB). Properties subject to the standards of this overlay district shall be designated as the Columbia Avenue Overlay District, hereinafter referred to as the CAO District, on the zoning map.

(b) Development review for properties within the CAO District shall be subject to the standards of this district. The underlying base districts shall govern land use. In case of conflict with dimensional standards of the base district, the standards of the CAO District, and the development standards of Chapter 5: Development Standards, these standards shall control.

(c) For the purpose of this ordinance, the CAO district is hereby divided into five sub-districts as depicted on the following maps. ~~These maps are provided for reference purposes only, and in case of conflict between the map in this Subsection and the Official Zoning Map, the Official Zoning Map shall control.~~

Most of the parcels located in CAO 5 are not located within the City limits, but it is anticipated that properties will be zoned into the CAO 5 if and when annexation occurs.

(3) General Development Standards

The following development standards shall apply to lots in all of the sub-districts of the CAO District:

(a) Parking and Access

(i) Surface parking spaces provided in excess of the minimum requirement established in Subsection 5.9.4, Off-street Parking Standards, shall be constructed of pervious materials. The Department of Planning and Sustainability shall only approve such additional spaces for overflow events, seasonal demands, and related reasons, based upon a demonstration of need by the applicant. However, such additional parking and access lanes shall use alternate pervious materials, such as grass or mulch-covered gridblocks, for the entire overflow area. Asphalt, concrete, crushed stone, and other impervious materials shall not be permitted for the entire overflow area.

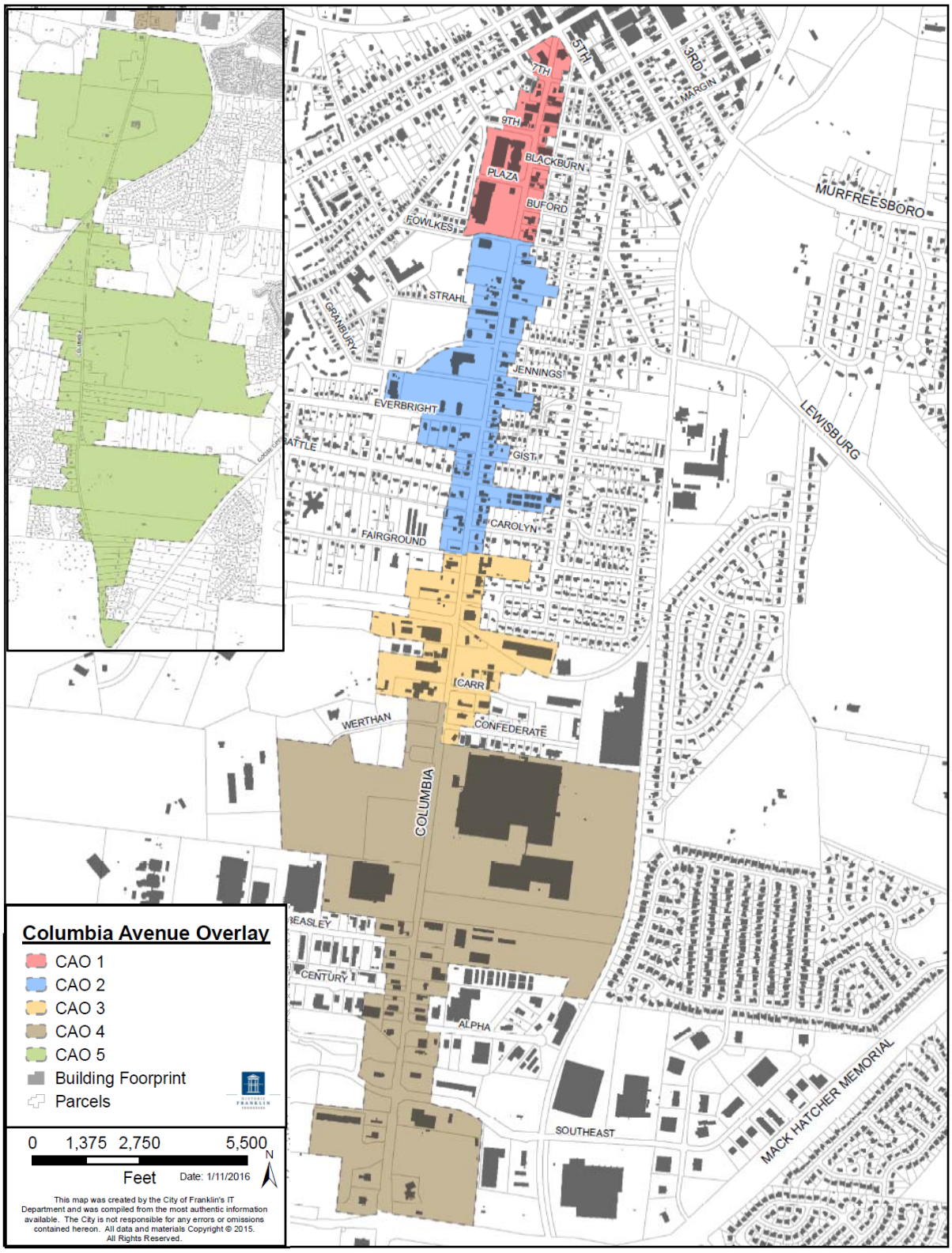
(ii) Perimeter landscape is required for parking lots. A continuous perimeter planting strip with an average width of eight feet is required, or a five-foot-wide planting strip may be used, with the inclusion of either a three-foot opaque wall/fence or evergreen shrubs planted two and one-half to three feet tall so as to achieve a solid screen within three years. Canopy trees shall be planted at a maximum separation of 30 feet on-center.

CAO 5 – Rural Gateway

(iii) All development shall be subject to the requirements in Chapter 5: Development Standards, related to landscape, street tree, and screening requirements unless otherwise noted.

(iv) Because cross-access is encouraged between adjacent commercial properties, parking lots for nonresidential developments that have direct access to a public street shall have at least one vehicular connection to adjacent properties unless deemed infeasible or inappropriate due to topography or other constraints. Lots in a HI District are exempt from the interconnectivity requirements.

Figure 3-1: CAO—Columbia Avenue Overlay Sub-Districts



Law Dept. approved 05.02.16

~~CAO 1 – Urban Commercial~~

~~CAO 3 – Commercial Transition~~

~~CAO 2 – Historic Residential~~

~~CAO 4 – Suburban Commercial/Industrial~~

Law Dept. approved 05.02.16

(4) CAO 1—Urban Commercial Development Standards

(a) Area Description

This sub-district, which includes properties located between the Five Points area and East Fowlkes Street, is at the northernmost end of the study area and is directly connected to downtown. Contemporary strip commercial development, as well as pre-WWII and civic buildings, are present in this sub-district. **While many buildings do not have historic protections, there are several buildings that were constructed over 50 years ago.** While commercial structures are the predominant building type, two historic residential structures are also present. At the effective date of this ordinance, the sub-district is characterized by:

(i) ~~Primarily one-story buildings with a limited number of two-story structures~~ **A mix of one and two-story buildings**;

(ii) A wide range of materials, including brick, aluminum siding, vinyl siding, and wood siding;

(iii) **Shallow front building setbacks with some** variation ~~in front and side building setbacks~~;

(iv) ~~A streetscape with narrow sidewalks, frequent curb cuts, and a lack of landscaping;~~ **Streetscape improvements were completed in 2010 providing a continuous sidewalk network on both sides of the street, access management, small-scale masonry signage, and landscaping enhancements.**

(v) ~~Excessive signage that is poorly located and designed.~~

~~**(b) Streetscape**~~

(i) ~~Sidewalks shall be required along public streets and shall have a minimum width of five feet, unobstructed by street trees, light poles, and similar features. Where such features block the sidewalk, a minimum sidewalk width of eight feet shall be required. To enhance pedestrian safety, a minimum strip of three and one half feet wide shall be provided from the edge of curb and shall contain pavers, sod, mulch, annuals, or low-growing shrubs.~~

(ii) ~~A combination of concrete and brick pavers shall be used for the construction of new sidewalks.~~

(iii) ~~For properties within the Franklin Gateway Corridors and Connector Streets Project (Franklin Streetscape Program), the adopted streetscape plan for those parcels shall govern.~~

(iv) ~~Street trees should be installed in "plant wells" with tree grates and properly designed drainage and irrigation systems. Street trees shall be planted a minimum of 40 feet on-center and shall be a minimum of three and one-half-inch caliper and 14 to 16 feet in height at the time of installation. Specific spacing of trees should be determined on a block-by-block case based on existing features such as building façades. Shade trees forming a canopy are recommended.~~

(v) ~~If existing cobra-head streetlights are removed, decorative replacement lighting shall be installed and may range between 16 and 20 feet in height. If the cobra head streetlights are not removed, supplemental decorative lights shall be installed but shall not exceed 14 feet in height.~~

(vi) ~~Pedestrian crossings should be clearly delineated through the use of a different pavement color and texture.~~

(c) Building Heights, Massing, and Orientation

(i) Buildings shall be aligned parallel to Columbia Avenue with the main entrance facing the street. Corner entrances are an acceptable alternative for corner buildings.

(ii) ~~**Buildings shall be built to the sidewalk.**~~ **Buildings shall have front setbacks of 5 to 10 feet from the back of the sidewalk**. Institutional uses are permitted to have a variable front building setback from ~~zero~~**5** to 40 feet from the back of the sidewalk to signify and reinforce their prominent role in the urban fabric and to afford additional safety.

(iii) Buildings **fronting Columbia Avenue and East and West Fowlkes Street** shall not exceed two stories ~~or a maximum height of 35 feet~~. A maximum height limit of three stories~~, not to exceed a total height of 42 feet,~~ is permitted **for buildings internal to the site (not along Columbia Avenue or East and West Fowlkes Street)** in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.

(iv) ~~The maximum linear length of an uninterrupted facade plane shall be 35 feet.~~ Building wall offsets (projections and recesses) or pilasters shall be used to break up the mass of a single building into bays. Variations in roofline, materials, and color may also be used to break up massing.

Figure 3-2: **The rendering shows the Hill Center in Sylvan Park and serves as an example of having a taller building internal to the site.**

(v) To better replicate the historic urban fabric of Columbia Avenue, new buildings in this sub-district shall be designed to ~~either~~ **the following standards:**

~~A.) Differentiate, at a minimum, their Columbia Avenue façades every 100 feet or less of linear frontage so as to replicate the historic "rhythm" of building front widths along the street; or~~
Differentiate the Columbia Avenue facades so as to replicate the historic rhythm of building front widths along the street. For one-story buildings, a different façade treatment shall be provided every 50 feet or less of linear frontage along Columbia Avenue. For two story buildings, a different façade treatment shall be provided every 100 feet or less of linear frontage along Columbia Avenue.

~~B.) Have a maximum building width not exceeding 100 feet fronting Columbia Avenue. Irrespective of property lines, a new building shall be separated at least 15 feet, but no greater than 40 feet, from adjacent proposed or existing buildings. Between the buildings, pedestrian-scale lighting and formal open space shall be provided, as identified in Chapter 5: Development Standards.~~

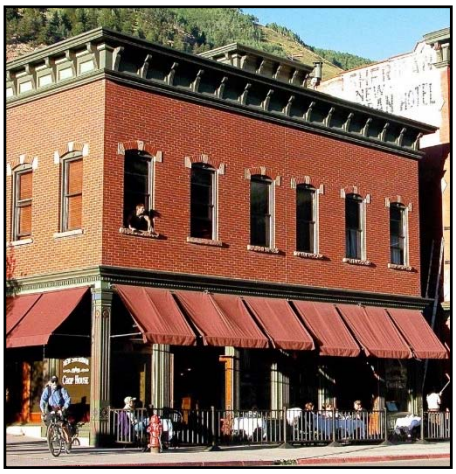
Figure ~~3-2~~ 3-3: Examples of buildings having a different façade treatment every 100 feet or less to replicate the historic character of other buildings in the area.

(d) Roofs

(i) ~~For commercial-type buildings,~~ **For non-residential, mixed-use, and attached residential buildings,** flat roofs or roofs with parapet walls shall be the predominant roof form.

(ii) Buildings with a residential character shall employ either gable, hipped, or pyramidal roofs having a slope between 5:12 and 12:12. Sloped roofs shall include overhanging eaves that extend a minimum of one foot beyond the building wall.

Figure ~~3-3~~ 3-4: Example of a flat roof with parapet walls, which should be the predominant roof type for commercial buildings in CAO 1, CAO 3, and CAO 4.



(e) Façades

(i) Façades of buildings shall emphasize clearly identified main entrances using awnings, canopies, columns, pilasters, and recessed entrances. Storefronts shall be integrally designed with the upper floors of a building to be compatible with the overall character of the façade.

(ii) Window and door openings shall have a vertical orientation and alignment between floors. **Faux windows, reflective glass, and tinted glass shall be prohibited.**

(iii) Blank walls facing streets shall be prohibited.

(iv) Commercial, office, institutional, and mixed-use buildings shall have a discernible base and cap that are clearly defined by horizontal elements along the bottom and top of the building. Elements to achieve this standard include water tables, storefront “kick-plates,” stringcourses, corbelling, and material changes.

Figure ~~3-~~4 3-5: ~~Example of with a building~~ **Examples of buildings in CAO 1** with a discernible base and cap.

(v) For two **and three**-story commercial, office, institutional, and mixed-use buildings, **a minimum of 60** ~~65 to 85~~ percent of the first floor shall be glazed, while 35 to **60** ~~65~~ percent of the façade area on upper floors shall be glazed, exclusive of the parapet wall. For one-story commercial or office buildings, **60** ~~65~~ to 85 percent of the front façade shall be glazed, exclusive of the parapet wall. Reflective glass or tinted glass shall be prohibited.

(vi) For buildings having a residential character, a minimum of 25 percent of the façade area shall be covered with window and door openings. ~~Storefronts with generous amounts of window and door transparency properly located and proportioned animate the streetscape by providing visual interest for pedestrians.~~

(f) Building Materials

(i) For commercial, office, institutional, and mixed-use buildings, brick or stone shall comprise a minimum of 75 percent of the primary building materials. For accent purposes, stone, cast stone, cement-based stucco**,** and split-faced concrete block shall be permitted.

(ii) ~~For residential buildings, either brick, wood siding, or fibrous cement siding that closely resembles wood siding, shall comprise at least 50 percent of the primary building material. Cast stone, stone, and cementitious materials shall be permitted and are encouraged as accents to the primary building material.~~

(iii) ~~Vinyl, aluminum siding, Exterior Insulation Finish Systems (referred to as EIFS), and smooth-face block, and other synthetic materials shall be prohibited.~~

(g) Parking and Access

(i) Off-street parking areas are prohibited between the building and Columbia Avenue.

(ii) A maximum of 25 percent of the parking spaces may be located along the side of the building.

(iii) To the maximum extent practicable, access to commercial uses shall be provided from side streets.

(iv) Rear access from Cummins Street shall be required on the east side of Columbia Avenue.

(v) Driveway-width curb radii for access shall be kept to a minimum to facilitate pedestrian traffic.

(vi) ~~Developments shall be limited to no more than one access driveway unless a traffic report verifies the justification for an additional access point.~~

(vii) Where parking abuts the public right-of-way, a three-foot-high masonry wall, designed to complement the building, fence, or evergreen shrubs, may be installed in lieu of the opaque screen required by Section 5.4, Landscape, Buffers, and Screening.

(viii) **Where a nonresidential use or parking serving a nonresidential use is adjacent to or across the street from a residential use, a six foot masonry wall shall be installed.** ~~Parking lots shall be screened and landscaped pursuant to Chapter 5: Development Standards.~~

(5) CAO 2—Historic Residential Development Standards

(a) Area Description

Pre-WWII residential structures are the primary building type in this sub-district located between East Fowlkes and Fairground Streets. **Institutional buildings, strip commercial development, and reclaimed battlefield open space are** interspersed with ~~the~~ residential structures. ~~are institutional buildings (Boys and Girls Club and Battle Ground Academy) and strip commercial development.~~ While many of the residential structures are still used as homes, some now function as offices, small retail businesses, and museums (Carter House and Lotz House). ~~The properties that are located north of Jennings Street (east side of Columbia Avenue) and Granbury Street (west side of Columbia Avenue) are zoned GC, while the properties to the south of these streets are zoned R-3.~~ The physical development form in this sub-district is characterized by:

(i) One and two-story residential structures and one-story commercial buildings;

(ii) The use of brick and wood siding as the primary building materials;

(iii) **Most** front building setbacks range between 15 and 75 feet; and

(iv) Sidewalks located directly adjacent to the street that do not extend the entire length of the sub-district.

(b) Streetscape

(i) ~~Sidewalks and street trees shall be provided as required by Chapter 5: Development Standards.~~

(ii) ~~Sidewalks shall have a minimum width of five feet.~~

(iii) There shall be a planting strip with a minimum width of six feet between the curb of the street and the sidewalk.

Figure ~~3-5~~ 3-6: Illustration of planting strips required within CAO 2.

(iv) Sidewalks shall be constructed of concrete.

(v) Street trees shall be installed in the planting strip located between the street and the sidewalk. Trees shall be planted in accordance with Subsection 5.4.8, Street Trees. Additional right-of-way may be needed to accommodate the planting strip.

(vi) Pedestrian street crossings shall be provided and clearly delineated through the use of a different pavement color and texture.

Figure ~~3-6~~ 3-7: Example of a cross walk constructed of stenciled concrete. Pedestrian cross walks constructed of stenciled concrete, or an approved equivalent, enhance historic character CAO 2 and serve as a traffic-calming measure.

(c) Building Heights, Massing, and Orientation

(i) Buildings shall not exceed two stories~~, or a maximum height of 35 feet. A maximum height limit of three stories, not to exceed a total height of 42 feet, is permitted in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.~~

(ii) Buildings **on the east side of Columbia Ave shall have a minimum setback of** ~~may be set back from between 15~~ **40** ~~to 50~~ feet from the right-of-way. **Buildings on the west side of Columbia Avenue shall have a minimum setback of 30 feet from the right-of-way. No new structure shall be closer to the right-of-way than the closest existing principal structure.** ~~However, in locations adjacent to historic structures that contribute to historic character in CAO 2, new building setbacks shall not deviate more than 25 percent from the average building setback as measured from the closest historic structures immediately adjacent to and on the same side of the street as the proposed new building.~~

(iii) The front façade maximum building width shall not exceed 45 feet.

Figure 3-8: **Four single-family homes have a consistent front setback along Columbia Ave. The new building, part of General's Retreat, breaks the consistent development pattern.**

(d) Roofs

Main roofs shall be gables or hips with a slope between 5:12 and 12:12 and shall have overhanging eaves on all sides that extend a minimum of one foot beyond the building wall.

Figure ~~3-7~~ 3-9: Example of a gabled roof with overhanging eaves as required in CAO 2.

(e) Façades

(i) Façades of buildings housing nonresidential uses shall be configured to resemble residential building types.

(ii) Buildings shall have front porches with a minimum depth of six feet.

(iii) Window and door openings shall cover a minimum of 25 percent of the façade area.

(iv) Window and door openings shall have a vertical orientation and vertical alignment.

(v) Raised foundations shall be required with an elevation a minimum of 18 inches above the finished grade.

Figure 3-~~8~~ 3-10: This house demonstrates vertically oriented windows, a raised foundation, and a front porch consistent with existing historic homes in CAO 2.

(f) Exterior Building Materials

(i) ~~The base of buildings shall be of masonry materials. Primary façade materials shall not change at outside corners.~~

(ii) ~~Material changes shall occur along a horizontal line or where two forms intersect. One exception is that a change of materials may occur as accents around windows, at corners, or as a repetitive pattern, such as quoining.~~

(iii) **Brick**, wood siding or fibrous cement siding that closely resembles wood siding shall **be** ~~comprise at least 50 percent of~~ the primary building material. Cast stone, stone, and cementitious materials shall be permitted, and are encouraged, to accent the primary building material.

(iv) ~~Vinyl, aluminum siding, EIFS, and smooth-face block, and other synthetic materials shall be prohibited.~~

(g) Parking and Access

(i) Off-street parking areas shall not be located between the building and **Columbia Avenue** ~~any public street~~.

(ii) **A maximum of 25 percent of the parking spaces may be located along the side of the building.** ~~Parking is permitted on the side of the building, provided the parking complies with the landscaping and screening standards of Chapter 5: Development Standards~~.

(6) CAO 3—Commercial Transition Development Standards

(a) Area Description

The strip commercial development that extends north and south from the intersection of Downs Boulevard and Columbia Avenue comprises CAO 3. ~~These properties, along with CAO 1, anchor both ends of the residential portion of the Columbia Avenue corridor (CAO 2).~~ The intent of these standards is to create a more pedestrian-oriented commercial node that is complimentary to the adjacent residential development. Many of the standards developed for these properties will be similar to CAO 1. On the effective date of this ordinance, this sub-district was characterized by:

(i) One-story buildings;

(ii) A wide range of materials, including stucco, concrete block, pre-fabricated metal panels, and vinyl siding;

(iii) Excessive building setbacks with parking in front;

(iv) A streetscape with continuous curb cuts and no sidewalks or landscaping; and

(v) Excessive signage that is poorly located and designed.

(b) Streetscape

(i) ~~Sidewalks and street trees shall be provided as required by Chapter 5: Development Standards.~~

(ii) ~~Sidewalks shall have a minimum width of five feet.~~

(iii) There shall be a planting strip with a minimum width of six feet between the curb of the street and the sidewalk.

(iv) Street trees shall be installed in the planting strip located between the street and the sidewalk. Trees shall be planted a minimum of 30 feet on-center and shall be a minimum of **two** ~~three~~ and one-half-inch caliper and 14 to16 feet in height at installation.

(v) If existing cobra-head streetlights are removed, decorative replacement lighting shall be installed and may range between 16 and 20 feet in height. If the cobra-head streetlights are not removed, supplemental decorative lights shall be installed but shall not exceed 14 feet in height.

(vi) Pedestrian crossings shall be clearly delineated through the use of a different pavement color and texture.

(c) Building Heights, Massing, and Orientation

(i) Buildings shall be aligned parallel to Columbia Avenue with the main entrance facing the street. Corner entrances are an acceptable alternative for corner buildings.

(ii) Buildings **shall have a minimum setback of 15 feet from the dedicated right-of-way** ~~can be built to the back of the sidewalk but may have a variable front building setback of zero to 40 feet from the sidewalk~~.

(iii) ~~Parking shall be located to the side or rear of the structure~~.

(iv) Buildings shall not exceed two stories~~ or a maximum height of 35 feet~~. ~~A maximum height limit of three stories, not to exceed a total height of 42 feet, is permitted in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.~~

(v) ~~The maximum linear length of an uninterrupted façade plane shall be 35 feet.~~ Building-wall offsets (projections and recesses) or pilasters shall be used to break up the mass of a single building into bays. Variations in roofline, materials, and color may also be used to break up massing.

(vi) ~~To better replicate the previous urban fabric of Columbia Avenue, new buildings shall be designed to either:~~

~~A.) Differentiate, at a minimum, their Columbia Avenue façades every 100 feet or less of linear frontage so as to replicate the historic rhythm of building-front widths along the street (See Figure 3-2.); or~~

~~B.) Have a maximum building width not exceeding 100 feet fronting Columbia Avenue. Irrespective of property lines, a new building shall be separated at least 15 feet, but no greater than 40 feet, from adjacent proposed or existing buildings. Between the buildings, pedestrian-scale lighting and formal open space shall be provided as identified in Chapter 5, Development Standards.~~

(d) Roofs

(i) For commercial-type buildings, flat roofs or roofs with parapet walls shall be the predominant roof form.

(ii) Buildings with a residential character shall employ either gable, hipped, or pyramidal roofs having a slope between 5:12 and 12:12. Sloped roofs shall include overhanging eaves that extend a minimum of one foot beyond the building wall.

(e) Façades

(i) Façades of buildings shall emphasize clearly identified main entrances using awnings, canopies, columns, pilasters, and recessed entrances. Storefronts shall be integrally designed with the upper floors of a building to be compatible with the overall character of the facade.

(ii) Window and door openings shall have a vertical orientation and alignment between floors.

(iii) Blank walls facing streets shall be prohibited.

(iv) Commercial, office, institutional, and mixed-use buildings shall have a discernible base and cap clearly defined by horizontal elements along the bottom and top of the building. Elements to achieve this standard include water tables, storefront kick-plates, stringcourses, corbelling, and material changes.

(v) For two-story commercial, office, institutional, and mixed-use buildings, 65 to 85 percent of the first floor shall be glazed, while 35 to 65 percent of the façade area on upper floors shall be glazed exclusive of the parapet wall. **Faux windows shall be prohibited.** For one-story commercial or office buildings, **60** ~~65~~ to 85 percent of the front façade shall be glazed, exclusive of the parapet wall. Reflective or tinted glass shall be prohibited on the first floor.

(vi) For buildings having a residential character, a minimum of 25 percent of the façade area shall be covered with window and door openings. Storefronts with generous amounts of window and door transparency properly located and proportioned animate the streetscape by providing visual interest for pedestrians.

(f) Building Materials

(i) ~~For commercial, office, institutional, and mixed-use buildings, brick or stone shall comprise a minimum of 75 percent of the primary building materials. For accent purposes, stone, cast stone, cement-based stucco, and split-faced concrete block shall be permitted.~~

(ii) For residential buildings, either brick, wood siding, or fibrous cement siding that closely resembles wood siding, shall **be** ~~comprise at least 50 percent of~~ the primary building material. Cast stone, stone, and cementitious materials shall be permitted, and are encouraged as accents to the primary building material.

(iii) ~~Vinyl, aluminum siding, EIFS, and smooth-face block, and other synthetic materials shall be prohibited.~~

(g) Parking and Access

(i) Off-street parking areas are prohibited from being located between the building and any public street.

(ii) **Drive-through uses are prohibited on properties north of Downs Boulevard to create a pedestrian-oriented node.**

(iii) A maximum of 25 percent of the parking spaces may be located along the side of the building.

(iv) ~~Where parking abuts the public right-of-way, a three-foot-high masonry wall, designed to complement the building, a fence, or evergreen shrubs may be installed in lieu of the opaque screen required by Section 5.4, Landscape, Buffers, and Screening.~~

(v) ~~Parking lots shall be screened and landscaped pursuant to Chapter 5: Development Standards.~~

(7) CAO 4—Suburban Commercial/Industrial Development Standards

(a) Area Description

Light industrial, offices, **and** retail, ~~and agricultural~~ are the primary land uses in this sub-district, which extends from roughly Carr Avenue to Mack Hatcher Parkway. Although there is no cohesiveness to building design, on the effective date of this ordinance, the physical development form in this sub-district was characterized by:

(i) One and two-story buildings with large footprints;

(ii) A wide range of materials, including aluminum siding, brick, and pre-cast concrete panels;

(iii) Deep front setbacks with parking located in front of buildings; and

(iv) A streetscape with no sidewalks or street trees.

(b) Streetscape

(i) ~~Sidewalks and street trees shall be provided as required by Chapter 5: Development Standards.~~

(ii) ~~Sidewalks shall have a minimum width of five feet.~~

(iii) ~~There shall be a planting strip with a minimum width of five feet, but preferably eight feet, between the curb of the street and the sidewalk.~~

(iv) Street trees shall be installed in the planting strip located between the street and the sidewalk. Trees shall be planted a minimum of 40 feet on-center and shall be a minimum of **two** ~~three~~ and one-half-inch caliper and 14 to 16 feet in height at installation.

(v) **Existing stonewalls shall be preserved, or if necessary, shall be relocated to another location in the CAO District.**

(c) Building Heights, Massing, and Orientation

Building heights and setbacks shall comply with the site development requirements of the underlying base district.

(d) Roofs

(i) ~~Roofs shall be appropriate to a building's architecture.~~

(ii) For commercial-type buildings, flat roofs or roofs with parapet walls shall be the predominant roof form.

(e) Façades

Façades shall incorporate a minimum of 20 percent glazing along the front facade of the building.

~~**(f) Exterior Building Materials**~~

(i) ~~The base of buildings shall be of masonry materials. Primary façade materials shall not change at outside corners.~~

(ii) ~~Material changes shall happen along a horizontal line or where two forms intersect. One exception is that a change of materials may occur as accents around windows, at corners, or as a repetitive pattern, such as quoining.~~

(iii) ~~Standard smooth-face concrete block shall be prohibited.~~

(iv) ~~EIFS may be used above six feet from grade~~.

~~**(g) Parking**~~

~~See Chapter 5: Development Standards.~~

(8) CAO 5—Rural Gateway Development Standards

(a) Area Description

This sub-district, in the southern portion of Franklin's Urban Growth Boundary (UGB), has a rural character, with large lots and significant amounts of vacant land. Reinforcing its rural character, this portion of the corridor becomes known as Columbia Pike south of Mack Hatcher Parkway. Columbia Pike serves as a southern gateway into the city, with its rural character that is important to the image of the community, particularly given its historic significance. Some parcels within this corridor contain forested areas, tree rows, hillcrests, hillsides, and steep slopes (greater than 20 percent). Residential development is occurring in subdivisions of one-acre lots or larger to accommodate the required on-site sewage treatment; however, this trend is viewed by many residents as sprawl and an undesirable trend for continuation. To stop and reverse this trend, and for the appealing rural and agrarian character of this sub-district to be maintained, future development ~~should~~ **shall** be substantially set back from Columbia Pike, with an emphasis on the preservation of substantial tracts of open space along this corridor.

(b) Columbia Pike Buffer

Within a 20-foot buffer measured from the right-of-way of Columbia Pike:

(i) The buffer shall contain at least two canopy trees per 100 linear feet of the frontage along the public right-of-way. Where canopy trees will conflict with overhead utilities, understory trees shall be used.

(ii) A fence or a wall shall be constructed. Fences and walls shall be constructed of durable and natural materials to allow for natural weather processes and reduced maintenance. Walls shall be constructed of natural stone in the dry-stack method or without mortar, and shall be a minimum of three feet in height. (See Figure 3-12.) Cultured stone shall not be used. Fences shall be a four-board horse fence, a minimum of four feet in height, constructed of wood, and painted black. (See Figure 3-11.) Vinyl fencing is prohibited in this buffer yard. The Department of Planning and Sustainability may approve other colors or types of fences, such as picket, split rail, wrought iron, or brick walls, if the applicant demonstrates that such a fence or wall is better suited to the portion of the CAO District in which it is proposed. A fence or wall shall not be required if, in the opinion of the Department of Planning and Sustainability, based on steep slopes, floodplain, existing vegetation, or other topographical constraints, the fence or wall would serve no meaningful purpose or may cause adverse environmental impacts.

(c) Building Placement in New Development

To maintain the existing rural character of Columbia Pike, new development, regardless of land use, shall ~~either~~ face Columbia Pike and be set back from the right-of-way at least 250 feet., ~~or be designed according to at least one of the following options:~~

(i) ~~In cases in which existing smaller lot sizes make compliance with the 250-foot setback impossible, additional screening and landscaping shall be used to mitigate the impacts of having buildings located closer to the street. The additional screening shall include a 30-foot-wide linear-form buffer adjacent to the right-of-way of Columbia Pike. The intent of the additional screening shall be to completely obscure building encroachment within the 250-foot setback from view from the Columbia Pike corridor by a densely planted buffer. Plantings within the buffer shall be in accordance with Subsection 3.4.7 (8)(b).~~

(ii) ~~Linear open space 250 feet deep, or greater, measured from the right-of-way of Columbia Pike, shall separate the buildable lots located on the interior of the development from Columbia Pike. Furthermore, a 30-foot-wide landscaped buffer, designed according to Subsection 3.4.7(8)(b), shall be provided as closely as possible to the buildable lots to completely obscure the new development from view from Columbia Pike.~~

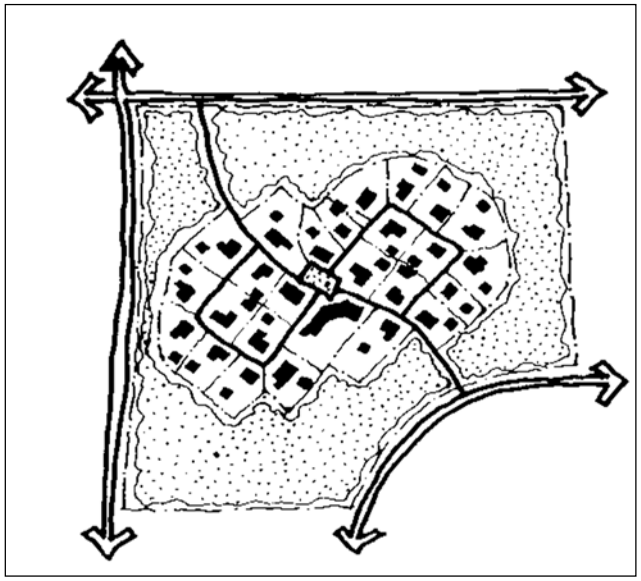


Figure 3-~~9~~ 3-10: Appropriate Development Example—Buildable lots located within the interior of a development shall be set back from the Columbia Avenue right-of-way in accordance with Subsection 3.4.7(8).

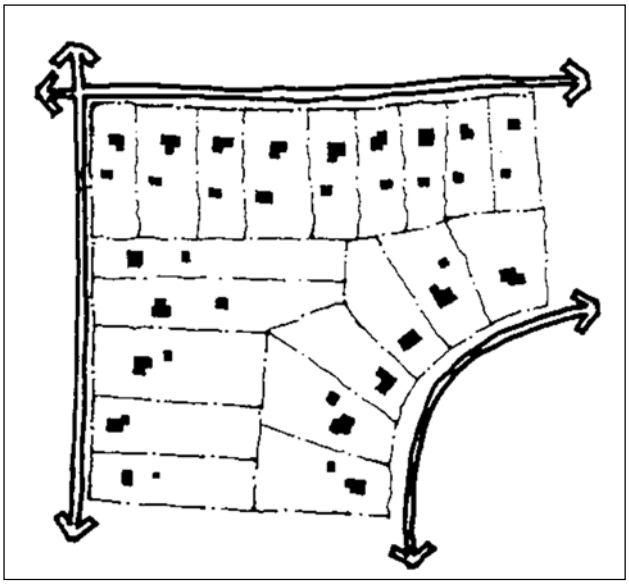


Figure 3-~~10~~ 3-11: Inappropriate Development Example—New development is prohibited from being located within 250 feet of the Columbia Avenue right-of-way ~~unless otherwise exempted or buffered according to the standards this subsection~~.

(d) Streetscape

(i) To maintain the sub-district's rural character, sidewalks and street trees shall not be required along Columbia Avenue**.**

(ii) **Compliance with the City's approved Parks Masterplan and Greenways and Open Space Plan is required.**

(iii) **Historically based fences, such as rail and board fences, and low, dry-stacked stone walls, may be included in the buffer and are encouraged. Stone walls shall be consistent in design and stone type with historic precedents found in the county. If a stone wall is used, the shrub requirement for the buffer shall be waived.**

~~**(e) Rural Gateway Buffer**~~

~~When new buildings will not face Columbia Pike and be set back from the right-of-way at least 250 feet, the following standards shall apply for the Rural Gateway Buffer used to obscure the development from Columbia Pike:~~

(i) ~~A minimum of 12 trees and 40 shrubs per 100 linear feet of street frontage shall be provided.~~

(ii) ~~No parking areas or structures shall be permitted within the buffer, and the buffer shall not be disturbed for any reason except as permitted within buffers by Section 5.4, Landscape, Buffers, and Screening.~~

(iii) ~~The plants shall be from the approved plant list as maintained by the Department of Planning and Sustainability; however, species indigenous to the area are suggested to provide a natural appearance.~~

(iv) ~~Tree spacing shall be random and not in uniform rows.~~

(v) ~~Shrubs and trees shall be planted in the buffer in accordance with the following ratios:~~

~~A.) At least 25 percent of the shrubs shall be evergreen shrubs;~~

~~B.) At least 40 percent of the trees shall be canopy trees; and~~

~~C.) At least 25 percent of the trees shall be understory trees.~~

(vi) ~~Contemporary man-made features, such as berms, shall not be used for screening.~~

(vii) ~~To prevent the harmful consequences of a monoculture, no more than 40 percent of any one genus of trees and shrubs shall be included in any planting.~~

(viii) ~~Historically based fences, such as rail and board fences, and low, dry-stacked stone walls, may be included in the buffer and are encouraged. Stone walls shall be consistent in design and stone type with historic precedents found in the county. If a stone wall is used, the shrub requirement for the buffer shall be waived.~~

(ix) ~~Where adjacent properties have been developed according to this standard, or where existing vegetation exists, the buffer shall connect to such vegetation to give the appearance of an existing farm-field boundary.~~

Figure ~~3-11~~ 3-13: Black four-board horse fences are allowed in CAO 5.

Figure ~~3-12~~ 3-14: Stone walls ~~are allowed~~ **shall be preserved** in CAO 5.

(f) Building Heights

Buildings shall not exceed two stories ~~or a maximum height of 35 feet~~. A maximum height limit of three stories, ~~not to exceed a total height of 42 feet,~~ is permitted in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.

(g) Roofs

(i) For commercial-type buildings, flat roofs or roofs with parapet walls shall be the predominant roof form.

(ii) Buildings with a residential character shall employ either gable, hipped or pyramidal roofs having a slope between 5:12 and 12:12. Sloped roofs shall include overhanging eaves that extend a minimum of one foot beyond the building wall.

(h) Façades

(i) Façades of buildings shall emphasize clearly identified main entrances using awnings, canopies, columns, pilasters, and recessed entrances. Storefronts shall be integrally designed with the upper floors of a building to be compatible with the overall character of the facade.

(ii) ~~Window and door openings shall have a vertical orientation and alignment between floors.~~

(iii) ~~Blank walls facing streets shall be prohibited.~~

(iv) ~~Commercial, office, institutional, and mixed-use buildings shall have a discernible base and cap that are clearly defined by horizontal elements along the bottom and top of the building. Elements to achieve this standard include water tables, storefront kick-plates, string courses, corbelling, and material changes.~~

(v) ~~For two-story commercial, office, institutional, and mixed-use buildings, 65 to 85 percent of the first floor shall be glazed, while 35 to 65 percent of the façade area on upper floors shall be glazed, exclusive of the parapet wall. For one-story commercial or office buildings, 65 to 85 percent of the front façade shall be glazed, exclusive of the parapet wall. Reflective or tinted glass shall be prohibited.~~

(vi) For buildings having a residential character, a minimum of 25 percent of the façade area shall be covered with window and door openings. Storefronts with generous amounts of window and door transparency properly located and proportioned animate the streetscape by providing visual interest for pedestrians.

Figure ~~3-13~~ 3-15: The homes shown above are located in Harlinsdale Manor and serve as a good example of architectural style and character that would be appropriate in CAO 5.

(i) Building Materials

(i) ~~For commercial, office, institutional, and mixed-use buildings, brick or stone shall comprise a minimum of 75 percent of the primary building materials. For accent purposes, stone, cast stone, cement-based stucco, and split-faced concrete block shall be permitted.~~

(ii) For residential buildings, either brick, wood siding, or fibrous cement siding that closely resembles wood siding, shall **be** ~~comprise at least 50 percent of~~ the primary building material. Cast stone, stone, and cementitious materials shall be permitted and are encouraged as accents to the primary building material.

(iii) ~~Vinyl, aluminum siding, EIFS, and smooth-face block, and other synthetic materials shall be prohibited.~~

(j) Parking and Access

(i) ~~Off-street parking areas are prohibited from being located between the building and any public street.~~

(ii) Parking shall not be permitted between the building facade and Columbia Avenue, regardless of the building's setback, ~~unless a 30-foot buffer designed in accordance with Subsection 3.4.7(8)(e), Rural Gateway Buffer, is provided around the entire parking lot, except where the parking is contiguous to a building.~~

(iii) Parking is permitted on the side **and rear** of the building, provided that it complies with the landscaping and screening standards of Chapter 5: Development Standards.

SECTION II. BE IT FINALLY ORDAINED by the Board of Mayor and Aldermen of the City of Franklin, Tennessee, that this Ordinance shall take effect from and after its passage on third and final reading, the health, safety, and welfare of the citizens requiring it.

ATTEST:

By: _____

Eric Stuckey
City Administrator/Recorder

CITY OF FRANKLIN, TENNESSEE:

By: _____

Dr. Ken Moore
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

PLANNING COMMISSION RECOMMENDED: _____

PASSED FIRST READING: _____

PUBLIC HEARING HELD: _____

PASSED SECOND READING: _____

PASSED THIRD READING: _____

ORDINANCE 2015-80

TO BE ENTITLED: "AN ORDINANCE TO AMEND THE ZONING ORDINANCE OF THE CITY OF FRANKLIN, TENNESSEE, TO UPDATE THE DEVELOPMENT STANDARDS AND SUB-DISTRICT BOUNDARIES FOR THE CAO-COLUMBIA AVENUE OVERLAY DISTRICT BY AMENDING CHAPTER 3, SUBSECTION 3.4.7."

WHEREAS, US Highway 31 has historically linked Nashville and Columbia and serves as an important historic and cultural resource; and

WHEREAS, significant military action took place during the Civil War along Columbia Avenue (US Highway 31) between Winstead Hill and Downtown Franklin; and

WHEREAS, the City of Franklin, Tennessee, desires compatible and high-quality development along this important gateway; and

WHEREAS, the City of Franklin, Tennessee, first approved design standards for Columbia Avenue on June, 21, 2005; and

WHEREAS, the design standards were incorporated into the 2008 Franklin Zoning Ordinance, and it is within the best interests of the citizens of the City of Franklin to amend the Franklin Zoning Ordinance to update the Columbia Avenue Overlay standards.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF MAYOR AND ALDERMEN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That Chapter 3, Section 3.4 Subsection 3.4.7 of the Franklin Zoning Ordinance is hereby amended to delete the following text noted with a ~~strikethrough~~; to add the following text noted in **bold**; to renumber the subsequent figures in Chapter 3 accordingly, and is approved to read as follows:

1.1.1 CAO—Columbia Avenue Overlay District

(1) Purpose

Columbia Avenue serves as an integral southern gateway into Franklin. The corridor contains many important historic sites and many longstanding commercial and industrial uses. The City seeks to preserve and enhance the cultural resources along this corridor while also facilitating new development that will improve the character and function of this corridor. ~~Columbia Avenue is experiencing development pressures that threaten the area's visual and historic integrity~~. The CAO District shall supplement the standards of the base districts and provide protective measures to preserve and enhance the character of Columbia Avenue. More specifically, the standards are intended to:

(a) Insure the compatibility of new buildings with respect to the specific character of their immediate context;

(b) Reinforce the historically urban character of the portion of Columbia Avenue between the Five Points area and the Carter House;

(c) Protect and enhance the economic viability of the corridor by promoting high-quality development;

(d) Minimize negative impacts of development on the corridor's remaining open space; and

(e) Enhance the quality of development surrounding historic and cultural resources.

(2) Establishment and Applicability

(a) These standards generally address properties fronting along the Highway 31/Columbia Avenue corridor beginning at the Five Points area, located on the southern edge of the historic downtown commercial core, with the southernmost limits of the city's Urban Growth Boundary (UGB). Properties subject to the standards of this overlay district shall be designated as the Columbia Avenue Overlay District, hereinafter referred to as the CAO District, on the zoning map.

(b) Development review for properties within the CAO District shall be subject to the standards of this district. The underlying base districts shall govern land use. In case of conflict with dimensional standards of the base district, the standards of the CAO District, and the development standards of Chapter 5: Development Standards, these standards shall control.

(c) For the purpose of this ordinance, the CAO district is hereby divided into five sub-districts as depicted on the following maps. ~~These maps are provided for reference purposes only, and in case of conflict between the map in this Subsection and the Official Zoning Map, the Official Zoning Map shall control.~~ **Most of the parcels located in CAO 5 are not located within the City limits, but it is anticipated that properties will be zoned into the CAO 5 if and when annexation occurs.**

(3) General Development Standards

The following development standards shall apply to lots in all of the sub-districts of the CAO District:

(a) Parking and Access

(i) Surface parking spaces provided in excess of the minimum requirement established in Subsection 5.9.4, Off-street Parking Standards, shall be constructed of pervious materials. The Department of Planning and Sustainability shall only approve such additional spaces for overflow events, seasonal demands, and related reasons, based upon a demonstration of need by the applicant. However, such additional parking and access lanes shall use alternate pervious materials, such as grass or mulch-covered gridblocks, for the entire overflow area. Asphalt, concrete, crushed stone, and other impervious materials shall not be permitted for the entire overflow area.

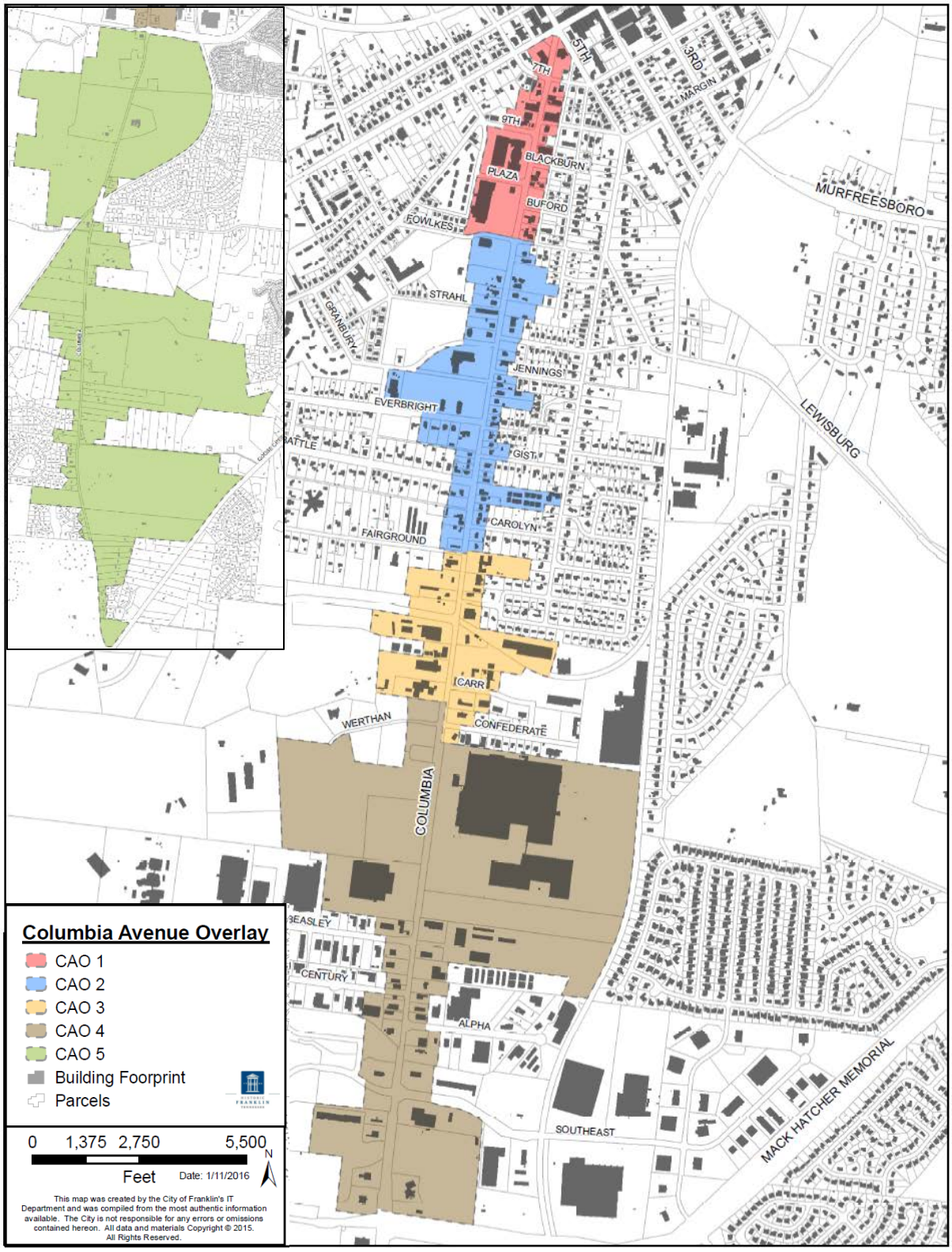
(ii) Perimeter landscape is required for parking lots. A continuous perimeter planting strip with an average width of eight feet is required, or a five-foot-wide planting strip may be used, with the inclusion of either a three-foot opaque wall/fence or evergreen shrubs planted two and one-half to three feet tall so as to achieve a solid screen within three years. Canopy trees shall be planted at a maximum separation of 30 feet on-center.

CAO 5 – Rural Gateway

(iii) All development shall be subject to the requirements in Chapter 5: Development Standards, related to landscape, street tree, and screening requirements unless otherwise noted.

(iv) Because cross-access is encouraged between adjacent commercial properties, parking lots for nonresidential developments that have direct access to a public street shall have at least one vehicular connection to adjacent properties unless deemed infeasible or inappropriate due to topography or other constraints. Lots in a HI District are exempt from the interconnectivity requirements.

Figure 3-1: CAO—Columbia Avenue Overlay Sub-Districts

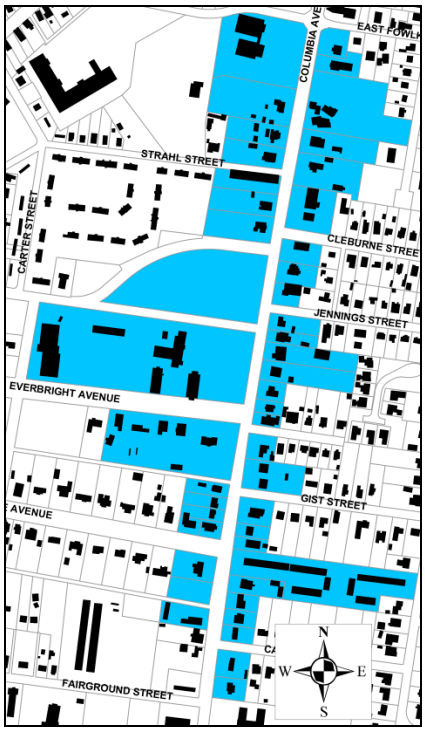


Law Dept. approved 04.14.16

~~CAO 1 – Urban Commercial~~

~~CAO 3 – Commercial Transition~~

~~CAO 2 – Historic Residential~~



~~CAO 4 – Suburban Commercial/Industrial~~

Law Dept. approved 04.14.16

(4) CAO 1—Urban Commercial Development Standards

(a) Area Description

This sub-district, which includes properties located between the Five Points area and East Fowlkes Street, is at the northernmost end of the study area and is directly connected to downtown. Contemporary strip commercial development, as well as pre-WWII and civic buildings, are present in this sub-district. **While many buildings do not have historic protections, there are several buildings that were constructed over 50 years ago.** While commercial structures are the predominant building type, two historic residential structures are also present. At the effective date of this ordinance, the sub-district is characterized by:

(i) ~~Primarily one-story buildings with a limited number of two story structures~~ **A mix of one and two-story buildings**;

(ii) A wide range of materials, including brick, aluminum siding, vinyl siding, and wood siding;

(iii) **Shallow front building setbacks with some** variation ~~in front and side building setbacks~~;

(iv) ~~A streetscape with narrow sidewalks, frequent curb cuts, and a lack of landscaping;~~ **Streetscape improvements were completed in 2010 providing a continuous sidewalk network on both sides of the street, access management, small-scale masonry signage, and landscaping enhancements.**

(v) ~~Excessive signage that is poorly located and designed.~~

~~**(b) Streetscape**~~

(i) ~~Sidewalks shall be required along public streets and shall have a minimum width of five feet, unobstructed by street trees, light poles, and similar features. Where such features block the sidewalk, a minimum sidewalk width of eight feet shall be required. To enhance pedestrian safety, a minimum strip of three and one-half feet wide shall be provided from the edge of curb and shall contain pavers, sod, mulch, annuals, or low-growing shrubs.~~

(ii) ~~A combination of concrete and brick pavers shall be used for the construction of new sidewalks.~~

(iii) ~~For properties within the Franklin Gateway Corridors and Connector Streets Project (Franklin Streetscape Program), the adopted streetscape plan for those parcels shall govern.~~

(iv) ~~Street trees should be installed in "plant wells" with tree grates and properly designed drainage and irrigation systems. Street trees shall be planted a minimum of 40 feet on-center and shall be a minimum of three and one-half inch caliper and 14 to 16 feet in height at the time of installation. Specific spacing of trees should be determined on a block-by-block case based on existing features such as building façades. Shade trees forming a canopy are recommended.~~

(v) ~~If existing cobra-head streetlights are removed, decorative replacement lighting shall be installed and may range between 16 and 20 feet in height. If the cobra-head streetlights are not removed, supplemental decorative lights shall be installed but shall not exceed 14 feet in height.~~

(vi) ~~Pedestrian crossings should be clearly delineated through the use of a different pavement color and texture.~~

(c) Building Heights, Massing, and Orientation

(i) Buildings shall be aligned parallel to Columbia Avenue with the main entrance facing the street. Corner entrances are an acceptable alternative for corner buildings.

(ii) ~~**Buildings shall be built to the sidewalk.**~~ **Buildings shall have front setbacks of 5 to 10 feet from the back of the sidewalk**. **Buildings along West Fowlkes Street shall have a minimum setback of 25 feet to provide a transition to the less intensive land uses and historic resources directly to the south.** Institutional uses are permitted to have a variable front building setback from ~~zero~~**5** to 40 feet from the back of the sidewalk to signify and reinforce their prominent role in the urban fabric and to afford additional safety.

(iii) Buildings **fronting Columbia Avenue and East and West Fowlkes Street** shall not exceed two stories ~~or a maximum height of 35 feet~~. A maximum height limit of three stories~~, not to exceed a total height of 42 feet,~~ is permitted **for buildings internal to the site (not along Columbia Avenue or East and West Fowlkes Street)** in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.

(iv) ~~The maximum linear length of an uninterrupted facade plane shall be 35 feet.~~ Building wall offsets (projections and recesses) or pilasters shall be used to break up the mass of a single building into bays. Variations in roofline, materials, and color may also be used to break up massing.

Figure 3-2: **The rendering shows the Hill Center in Sylvan Park and serves as an example of having a taller building internal to the site.**

(v) To better replicate the historic urban fabric of Columbia Avenue, new buildings in this sub-district shall be designed to ~~either~~ **the following standards:**

~~A.) Differentiate, at a minimum, their Columbia Avenue façades every 100 feet or less of linear frontage so as to replicate the historic "rhythm" of building front widths along the street; or~~
Differentiate the Columbia Avenue facades so as to replicate the historic rhythm of building front widths along the street. For one-story buildings, a different façade treatment shall be provided every 50 feet or less of linear frontage along Columbia Avenue. For two story buildings, a different façade treatment shall be provided every 100 feet or less of linear frontage along Columbia Avenue.

~~B.) Have a maximum building width not exceeding 100 feet fronting Columbia Avenue. Irrespective of property lines, a new building shall be separated at least 15 feet, but no greater than 40 feet, from adjacent proposed or existing buildings. Between the buildings, pedestrian-scale lighting and formal open space shall be provided, as identified in Chapter 5: Development Standards.~~

Figure ~~3-2~~ 3-3: Examples of buildings having a different façade treatment every 100 feet or less to replicate the historic character of other buildings in the area.

(d) Roofs

(i) ~~For commercial-type buildings,~~ **For non-residential, mixed-use, and attached residential buildings,** flat roofs or roofs with parapet walls shall be the predominant roof form.

(ii) Buildings with a residential character shall employ either gable, hipped, or pyramidal roofs having a slope between 5:12 and 12:12. Sloped roofs shall include overhanging eaves that extend a minimum of one foot beyond the building wall.

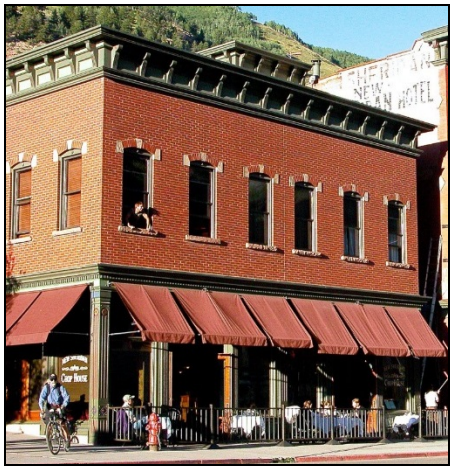


Figure ~~3-3~~ 3-4: Example of a flat roof with parapet walls, which should be the predominant roof type for commercial buildings in CAO 1, CAO 3, and CAO 4.

(e) Façades

(i) Façades of buildings shall emphasize clearly identified main entrances using awnings, canopies, columns, pilasters, and recessed entrances. Storefronts shall be integrally designed with the upper floors of a building to be compatible with the overall character of the façade.

(ii) Window and door openings shall have a vertical orientation and alignment between floors. **Faux windows, reflective glass, and tinted glass shall be prohibited.**

(iii) Blank walls facing streets shall be prohibited.

(iv) Commercial, office, institutional, and mixed-use buildings shall have a discernible base and cap that are clearly defined by horizontal elements along the bottom and top of the building. Elements to achieve this standard include water tables, storefront "kick-plates," stringcourses, corbelling, and material changes.

Figure ~~3-4~~ 3-5: ~~Example of with a building~~ **Examples of buildings in CAO 1** with a discernible base and cap.

(v) For two **and three**-story commercial, office, institutional, and mixed-use buildings, **a minimum of 60** ~~65 to 85~~ percent of the first floor shall be glazed, while 35 to **60** ~~65~~ percent of the façade area on upper floors shall be glazed, exclusive of the parapet wall. For one-story commercial or office buildings, **60** ~~65~~ to 85 percent of the front façade shall be glazed, exclusive of the parapet wall. Reflective glass or tinted glass shall be prohibited.

(vi) For buildings having a residential character, a minimum of 25 percent of the façade area shall be covered with window and door openings. ~~Storefronts with generous amounts of window and door transparency properly located and proportioned animate the streetscape by providing visual interest for pedestrians.~~

(f) Building Materials

(i) For commercial, office, institutional, and mixed-use buildings, brick or stone shall comprise a minimum of 75 percent of the primary building materials. For accent purposes, stone, cast stone, cement-based stucco**,** and split-faced concrete block shall be permitted.

(ii) ~~For residential buildings, either brick, wood siding, or fibrous cement siding that closely resembles wood siding, shall comprise at least 50 percent of the primary building material. Cast stone, stone, and cementitious materials shall be permitted and are encouraged as accents to the primary building material.~~

(iii) ~~Vinyl, aluminum siding, Exterior Insulation Finish Systems (referred to as EIFS), and smooth-face block, and other synthetic materials shall be prohibited.~~

(g) Parking and Access

(i) Off-street parking areas are prohibited between the building and Columbia Avenue.

(ii) A maximum of 25 percent of the parking spaces may be located along the side of the building.

(iii) To the maximum extent practicable, access to commercial uses shall be provided from side streets.

(iv) Rear access from Cummins Street shall be required on the east side of Columbia Avenue.

(v) Driveway-width curb radii for access shall be kept to a minimum to facilitate pedestrian traffic.

(vi) ~~Developments shall be limited to no more than one access driveway unless a traffic report verifies the justification for an additional access point.~~

(vii) Where parking abuts the public right-of-way, a three-foot-high masonry wall, designed to complement the building, fence, or evergreen shrubs, may be installed in lieu of the opaque screen required by Section 5.4, Landscape, Buffers, and Screening.

(viii) **Where a nonresidential use or parking serving a nonresidential use is adjacent to or across the street from a residential use, a six foot masonry wall shall be installed.**

~~Parking lots shall be screened and landscaped pursuant to Chapter 5: Development Standards.~~

(5) CAO 2—Historic Residential Development Standards

(a) Area Description

Pre-WWII residential structures are the primary building type in this sub-district located between East Fowlkes and Fairground Streets. **Institutional buildings, strip commercial development, and reclaimed battlefield open space are** interspersed with ~~the~~ residential structures. ~~are institutional buildings (Boys and Girls Club and Battle Ground Academy) and strip commercial development.~~ While many of the residential structures are still used as homes, some now function as offices, small retail businesses, and museums (Carter House and Lotz House). ~~The properties that are located north of Jennings Street (east side of Columbia Avenue) and Granbury Street (west side of Columbia Avenue) are zoned GC, while the properties to the south of these streets are zoned R-3.~~ The physical development form in this sub-district is characterized by:

(i) One and two-story residential structures and one-story commercial buildings;

(ii) The use of brick and wood siding as the primary building materials;

(iii) **Most** front building setbacks range between 15 and 75 feet; and

(iv) Sidewalks located directly adjacent to the street that do not extend the entire length of the sub-district.

(b) Streetscape

(i) ~~Sidewalks and street trees shall be provided as required by Chapter 5: Development Standards.~~

(ii) ~~Sidewalks shall have a minimum width of five feet.~~

(iii) There shall be a planting strip with a minimum width of six feet between the curb of the street and the sidewalk.

Figure ~~3-5~~ 3-6: Illustration of planting strips required within CAO 2.

(iv) Sidewalks shall be constructed of concrete.

(v) Street trees shall be installed in the planting strip located between the street and the sidewalk. Trees shall be planted in accordance with Subsection 5.4.8, Street Trees. Additional right-of-way may be needed to accommodate the planting strip.

(vi) Pedestrian street crossings shall be provided and clearly delineated through the use of a different pavement color and texture.

Figure ~~3-6~~ 3-7: Example of a cross walk constructed of stenciled concrete. Pedestrian cross walks constructed of stenciled concrete, or an approved equivalent, enhance historic character CAO 2 and serve as a traffic-calming measure.

(c) Building Heights, Massing, and Orientation

(i) Buildings shall not exceed two stories~~, or a maximum height of 35 feet. A maximum height limit of three stories, not to exceed a total height of 42 feet, is permitted in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.~~

(ii) Buildings **on the east side of Columbia Ave shall have a minimum setback of** ~~may be set back from between 15~~ **40** ~~to 50~~ feet from the right-of-way. **Buildings on the west side of Columbia Avenue shall have a minimum setback of 30 feet from the right-of-way. No new structure shall be closer to the right-of-way than the closest existing principal structure.** ~~However, in locations adjacent to historic structures that contribute to historic character in CAO 2, new building setbacks shall not deviate more than 25 percent from the average building setback as measured from the closest historic structures immediately adjacent to and on the same side of the street as the proposed new building.~~

(iii) The front façade maximum building width shall not exceed 45 feet.

Figure 3-8: **Four single-family homes have a consistent front setback along Columbia Ave. The new building, part of General's Retreat, breaks the consistent development pattern.**

(d) Roofs

Main roofs shall be gables or hips with a slope between 5:12 and 12:12 and shall have overhanging eaves on all sides that extend a minimum of one foot beyond the building wall.

Figure ~~3-7~~ 3-9: Example of a gabled roof with overhanging eaves as required in CAO 2.

(e) Façades

(i) Façades of buildings housing nonresidential uses shall be configured to resemble residential building types.

(ii) Buildings shall have front porches with a minimum depth of six feet.

(iii) Window and door openings shall cover a minimum of 25 percent of the façade area.

(iv) Window and door openings shall have a vertical orientation and vertical alignment.

(v) Raised foundations shall be required with an elevation a minimum of 18 inches above the finished grade.

Figure 3-~~8~~ 3-10: This house demonstrates vertically oriented windows, a raised foundation, and a front porch consistent with existing historic homes in CAO 2.

(f) Exterior Building Materials

(i) ~~The base of buildings shall be of masonry materials. Primary façade materials shall not change at outside corners.~~

(ii) ~~Material changes shall occur along a horizontal line or where two forms intersect. One exception is that a change of materials may occur as accents around windows, at corners, or as a repetitive pattern, such as quoining.~~

(iii) **Brick**, wood siding or fibrous cement siding that closely resembles wood siding shall **be** ~~comprise at least 50 percent of~~ the primary building material. Cast stone, stone, and cementitious materials shall be permitted, and are encouraged, to accent the primary building material.

(iv) ~~Vinyl, aluminum siding, EIFS, and smooth-face block, and other synthetic materials shall be prohibited.~~

(g) Parking and Access

(i) Off-street parking areas shall not be located between the building and **Columbia Avenue** ~~any public street~~.

(ii) **A maximum of 25 percent of the parking spaces may be located along the side of the building.** ~~Parking is permitted on the side of the building, provided the parking complies with the landscaping and screening standards of Chapter 5: Development Standards~~.

(6) CAO 3—Commercial Transition Development Standards

(a) Area Description

The strip commercial development that extends north and south from the intersection of Downs Boulevard and Columbia Avenue comprises CAO 3. ~~These properties, along with CAO 1, anchor both ends of the residential portion of the Columbia Avenue corridor (CAO 2).~~ The intent of these standards is to create a more pedestrian-oriented commercial node that is complimentary to the adjacent residential development. Many of the standards developed for these properties will be similar to CAO 1. On the effective date of this ordinance, this sub-district was characterized by:

(i) One-story buildings;

(ii) A wide range of materials, including stucco, concrete block, pre-fabricated metal panels, and vinyl siding;

(iii) Excessive building setbacks with parking in front;

(iv) A streetscape with continuous curb cuts and no sidewalks or landscaping; and

(v) Excessive signage that is poorly located and designed.

(b) Streetscape

(i) ~~Sidewalks and street trees shall be provided as required by Chapter 5: Development Standards.~~

(ii) ~~Sidewalks shall have a minimum width of five feet.~~

(iii) There shall be a planting strip with a minimum width of six feet between the curb of the street and the sidewalk.

(iv) Street trees shall be installed in the planting strip located between the street and the sidewalk. Trees shall be planted a minimum of 30 feet on-center and shall be a minimum of **two** ~~three~~ and one-half-inch caliper and 14 to16 feet in height at installation.

(v) If existing cobra-head streetlights are removed, decorative replacement lighting shall be installed and may range between 16 and 20 feet in height. If the cobra-head streetlights are not removed, supplemental decorative lights shall be installed but shall not exceed 14 feet in height.

(vi) Pedestrian crossings shall be clearly delineated through the use of a different pavement color and texture.

(c) Building Heights, Massing, and Orientation

(i) Buildings shall be aligned parallel to Columbia Avenue with the main entrance facing the street. Corner entrances are an acceptable alternative for corner buildings.

(ii) Buildings **shall have a minimum setback of 15 feet from the dedicated right-of-way** ~~can be built to the back of the sidewalk but may have a variable front building setback of zero to 40 feet from the sidewalk~~.

(iii) ~~Parking shall be located to the side or rear of the structure~~.

(iv) Buildings shall not exceed two stories ~~or a maximum height of 35 feet. A maximum height limit of three stories, not to exceed a total height of 42 feet, is permitted in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.~~

(v) ~~The maximum linear length of an uninterrupted façade plane shall be 35 feet.~~ Building-wall offsets (projections and recesses) or pilasters shall be used to break up the mass of a single building into bays. Variations in roofline, materials, and color may also be used to break up massing.

(vi) ~~To better replicate the previous urban fabric of Columbia Avenue, new buildings shall be designed to either:~~

~~A.) Differentiate, at a minimum, their Columbia Avenue façades every 100 feet or less of linear frontage so as to replicate the historic rhythm of building-front widths along the street (See Figure 3-2.); or~~

~~B.) Have a maximum building width not exceeding 100 feet fronting Columbia Avenue. Irrespective of property lines, a new building shall be separated at least 15 feet, but no greater than 40 feet, from adjacent proposed or existing buildings. Between the buildings, pedestrian-scale lighting and formal open space shall be provided as identified in Chapter 5, Development Standards.~~

(d) Roofs

(i) For commercial-type buildings, flat roofs or roofs with parapet walls shall be the predominant roof form.

(ii) Buildings with a residential character shall employ either gable, hipped, or pyramidal roofs having a slope between 5:12 and 12:12. Sloped roofs shall include overhanging eaves that extend a minimum of one foot beyond the building wall.

(e) Façades

(i) Façades of buildings shall emphasize clearly identified main entrances using awnings, canopies, columns, pilasters, and recessed entrances. Storefronts shall be integrally designed with the upper floors of a building to be compatible with the overall character of the facade.

(ii) Window and door openings shall have a vertical orientation and alignment between floors.

(iii) Blank walls facing streets shall be prohibited.

(iv) Commercial, office, institutional, and mixed-use buildings shall have a discernible base and cap clearly defined by horizontal elements along the bottom and top of the building. Elements to achieve this standard include water tables, storefront kick-plates, stringcourses, corbelling, and material changes.

(v) For two-story commercial, office, institutional, and mixed-use buildings, 65 to 85 percent of the first floor shall be glazed, while 35 to 65 percent of the façade area on upper floors shall be glazed exclusive of the parapet wall. **Faux windows shall be prohibited.** For one-story commercial or office buildings, **60** ~~65~~ to 85 percent of the front façade shall be glazed, exclusive of the parapet wall. Reflective or tinted glass shall be prohibited on the first floor.

(vi) For buildings having a residential character, a minimum of 25 percent of the façade area shall be covered with window and door openings. Storefronts with generous amounts of window and door transparency properly located and proportioned animate the streetscape by providing visual interest for pedestrians.

(f) Building Materials

(i) ~~For commercial, office, institutional, and mixed-use buildings, brick or stone shall comprise a minimum of 75 percent of the primary building materials. For accent purposes, stone, cast stone, cement-based stucco, and split-faced concrete block shall be permitted.~~

(ii) For residential buildings, either brick, wood siding, or fibrous cement siding that closely resembles wood siding, shall **be** ~~comprise at least 50 percent of~~ the primary building material. Cast stone, stone, and cementitious materials shall be permitted, and are encouraged as accents to the primary building material.

(iii) ~~Vinyl, aluminum siding, EIFS, and smooth-face block, and other synthetic materials shall be prohibited.~~

(g) Parking and Access

(i) Off-street parking areas are prohibited from being located between the building and any public street.

(ii) **Drive-through uses are prohibited on properties north of Downs Boulevard to create a pedestrian-oriented node.**

(iii) A maximum of 25 percent of the parking spaces may be located along the side of the building.

(iv) ~~Where parking abuts the public right-of-way, a three-foot-high masonry wall, designed to complement the building, a fence, or evergreen shrubs may be installed in lieu of the opaque screen required by Section 5.4, Landscape, Buffers, and Screening.~~

(v) ~~Parking lots shall be screened and landscaped pursuant to Chapter 5: Development Standards.~~

(7) CAO 4—Suburban Commercial/Industrial Development Standards

(a) Area Description

Light industrial, offices, **and** retail, ~~and agricultural~~ are the primary land uses in this sub-district, which extends from roughly Carr Avenue to Mack Hatcher Parkway. Although there is no cohesiveness to building design, on the effective date of this ordinance, the physical development form in this sub-district was characterized by:

(i) One and two-story buildings with large footprints;

(ii) A wide range of materials, including aluminum siding, brick, and pre-cast concrete panels;

(iii) Deep front setbacks with parking located in front of buildings; and

(iv) A streetscape with no sidewalks or street trees.

(b) Streetscape

(i) ~~Sidewalks and street trees shall be provided as required by Chapter 5: Development Standards.~~

(ii) ~~Sidewalks shall have a minimum width of five feet.~~

(iii) ~~There shall be a planting strip with a minimum width of five feet, but preferably eight feet, between the curb of the street and the sidewalk.~~

(iv) Street trees shall be installed in the planting strip located between the street and the sidewalk. Trees shall be planted a minimum of 40 feet on-center and shall be a minimum of **two** ~~three~~ and one-half-inch caliper and 14 to 16 feet in height at installation.

(v) **Existing stonewalls shall be preserved, or if necessary, shall be relocated to another location in the CAO District.**

(c) Building Heights, Massing, and Orientation

Building heights and setbacks shall comply with the site development requirements of the underlying base district.

(d) Roofs

(i) ~~Roofs shall be appropriate to a building's architecture.~~

(ii) For commercial-type buildings, flat roofs or roofs with parapet walls shall be the predominant roof form.

(e) Façades

Façades shall incorporate a minimum of 20 percent glazing along the front facade of the building.

~~**(f) Exterior Building Materials**~~

(i) ~~The base of buildings shall be of masonry materials. Primary façade materials shall not change at outside corners.~~

(ii) ~~Material changes shall happen along a horizontal line or where two forms intersect. One exception is that a change of materials may occur as accents around windows, at corners, or as a repetitive pattern, such as quoining.~~

(iii) ~~Standard smooth face concrete block shall be prohibited.~~

(iv) ~~EIFS may be used above six feet from grade~~.

~~**(g) Parking**~~

~~See Chapter 5: Development Standards.~~

(8) CAO 5—Rural Gateway Development Standards

(a) Area Description

This sub-district, in the southern portion of Franklin's Urban Growth Boundary (UGB), has a rural character, with large lots and significant amounts of vacant land. Reinforcing its rural character, this portion of the corridor becomes known as Columbia Pike south of Mack Hatcher Parkway. Columbia Pike serves as a southern gateway into the city, with its rural character that is important to the image of the community, particularly given its historic significance. Some parcels within this corridor contain forested areas, tree rows, hillcrests, hillsides, and steep slopes (greater than 20 percent). Residential development is occurring in subdivisions of one-acre lots or larger to accommodate the required on-site sewage treatment; however, this trend is viewed by many residents as sprawl and an undesirable trend for continuation. To stop and reverse this trend, and for the appealing rural and agrarian character of this sub-district to be maintained, future development ~~should~~ **shall** be substantially set back from Columbia Pike, with an emphasis on the preservation of substantial tracts of open space along this corridor.

(b) Columbia Pike Buffer

Within a 20-foot buffer measured from the right-of-way of Columbia Pike:

(i) The buffer shall contain at least two canopy trees per 100 linear feet of the frontage along the public right-of-way. Where canopy trees will conflict with overhead utilities, understory trees shall be used.

(ii) A fence or a wall shall be constructed. Fences and walls shall be constructed of durable and natural materials to allow for natural weather processes and reduced maintenance. Walls shall be constructed of natural stone in the dry-stack method or without mortar, and shall be a minimum of three feet in height. (See Figure 3-12.) Cultured stone shall not be used. Fences shall be a four-board horse fence, a minimum of four feet in height, constructed of wood, and painted black. (See Figure 3-11.) Vinyl fencing is prohibited in this buffer yard. The Department of Planning and Sustainability may approve other colors or types of fences, such as picket, split rail, wrought iron, or brick walls, if the applicant demonstrates that such a fence or wall is better suited to the portion of the CAO District in which it is proposed. A fence or wall shall not be required if, in the opinion of the Department of Planning and Sustainability, based on steep slopes, floodplain, existing vegetation, or other topographical constraints, the fence or wall would serve no meaningful purpose or may cause adverse environmental impacts.

(c) Building Placement in New Development

To maintain the existing rural character of Columbia Pike, new development, regardless of land use, shall ~~either~~ face Columbia Pike and be set back from the right-of-way at least 250 feet., ~~or be designed according to at least one of the following options:~~

(i) ~~In cases in which existing smaller lot sizes make compliance with the 250-foot setback impossible, additional screening and landscaping shall be used to mitigate the impacts of having buildings located closer to the street. The additional screening shall include a 30-foot-wide linear-form buffer adjacent to the right-of-way of Columbia Pike. The intent of the additional screening shall be to completely obscure building encroachment within the 250-foot setback from view from the Columbia Pike corridor by a densely planted buffer. Plantings within the buffer shall be in accordance with Subsection 3.4.7 (8)(b).~~

(ii) ~~Linear open space 250 feet deep, or greater, measured from the right-of-way of Columbia Pike, shall separate the buildable lots located on the interior of the development from Columbia Pike. Furthermore, a 30-foot wide landscaped buffer, designed according to Subsection 3.4.7(8)(b), shall be provided as closely as possible to the buildable lots to completely obscure the new development from view from Columbia Pike.~~

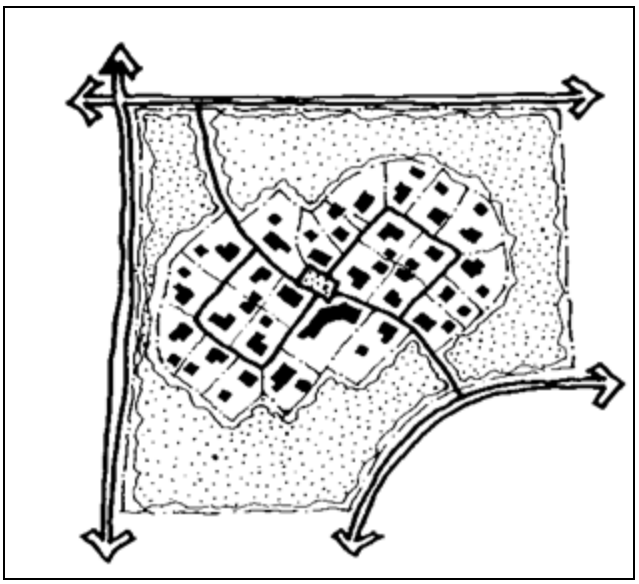


Figure 3-~~9~~ 3-10: Appropriate Development Example—Buildable lots located within the interior of a development shall be set back from the Columbia Avenue right-of-way in accordance with Subsection 3.4.7(8).

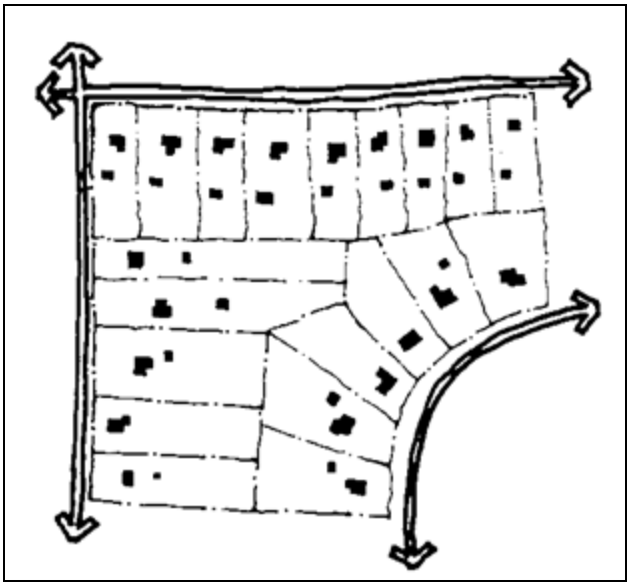


Figure 3-~~10~~ 3-11: Inappropriate Development Example—New development is prohibited from being located within 250 feet of the Columbia Avenue right-of-way ~~unless otherwise exempted or buffered according to the standards this subsection~~.

(d) Streetscape

(i) To maintain the sub-district's rural character, sidewalks and street trees shall not be required along Columbia Avenue**.**

(ii) **Compliance with the City's approved Parks Masterplan and Greenways and Open Space Plan is required.**

(iii) **Historically based fences, such as rail and board fences, and low, dry-stacked stone walls, may be included in the buffer and are encouraged. Stone walls shall be consistent in design and stone type with historic precedents found in the county. If a stone wall is used, the shrub requirement for the buffer shall be waived.**

~~**(e) Rural Gateway Buffer**~~

~~When new buildings will not face Columbia Pike and be set back from the right-of-way at least 250 feet, the following standards shall apply for the Rural Gateway Buffer used to obscure the development from Columbia Pike:~~

(i) ~~A minimum of 12 trees and 40 shrubs per 100 linear feet of street frontage shall be provided.~~

(ii) ~~No parking areas or structures shall be permitted within the buffer, and the buffer shall not be disturbed for any reason except as permitted within buffers by Section 5.4, Landscape, Buffers, and Screening.~~

(iii) ~~The plants shall be from the approved plant list as maintained by the Department of Planning and Sustainability; however, species indigenous to the area are suggested to provide a natural appearance.~~

(iv) ~~Tree spacing shall be random and not in uniform rows.~~

(v) ~~Shrubs and trees shall be planted in the buffer in accordance with the following ratios:~~

~~A.) At least 25 percent of the shrubs shall be evergreen shrubs;~~

~~B.) At least 40 percent of the trees shall be canopy trees; and~~

~~C.) At least 25 percent of the trees shall be understory trees.~~

(vi) ~~Contemporary man-made features, such as berms, shall not be used for screening.~~

(vii) ~~To prevent the harmful consequences of a monoculture, no more than 40 percent of any one genus of trees and shrubs shall be included in any planting.~~

(viii) ~~Historically based fences, such as rail and board fences, and low, dry stacked stone walls, may be included in the buffer and are encouraged. Stone walls shall be consistent in design and stone type with historic precedents found in the county. If a stone wall is used, the shrub requirement for the buffer shall be waived.~~

(ix) ~~Where adjacent properties have been developed according to this standard, or where existing vegetation exists, the buffer shall connect to such vegetation to give the appearance of an existing farm field boundary.~~

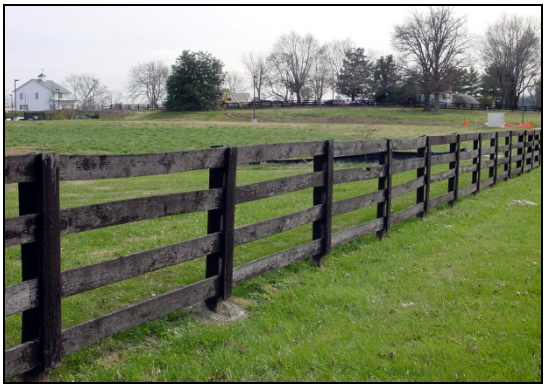


Figure ~~3-11~~ 3-13: Black four-board horse fences are allowed in CAO 5.

Figure ~~3-12~~ 3-14: Stone walls ~~are allowed~~ **shall be preserved** in CAO 5.

(f) Building Heights

Buildings shall not exceed two stories ~~or a maximum height of 35 feet~~. A maximum height limit of three stories, ~~not to exceed a total height of 42 feet,~~ is permitted in PUDs if the building and site design complies with Subsection 5.3.4, Transitional Features.

(g) Roofs

(i) For commercial-type buildings, flat roofs or roofs with parapet walls shall be the predominant roof form.

(ii) Buildings with a residential character shall employ either gable, hipped or pyramidal roofs having a slope between 5:12 and 12:12. Sloped roofs shall include overhanging eaves that extend a minimum of one foot beyond the building wall.

(h) Façades

(i) Façades of buildings shall emphasize clearly identified main entrances using awnings, canopies, columns, pilasters, and recessed entrances. Storefronts shall be integrally designed with the upper floors of a building to be compatible with the overall character of the facade.

(ii) ~~Window and door openings shall have a vertical orientation and alignment between floors.~~

(iii) ~~Blank walls facing streets shall be prohibited.~~

(iv) ~~Commercial, office, institutional, and mixed-use buildings shall have a discernible base and cap that are clearly defined by horizontal elements along the bottom and top of the building. Elements to achieve this standard include water tables, storefront kick-plates, string courses, corbelling, and material changes.~~

(v) ~~For two-story commercial, office, institutional, and mixed-use buildings, 65 to 85 percent of the first floor shall be glazed, while 35 to 65 percent of the façade area on upper floors shall be glazed, exclusive of the parapet wall. For one-story commercial or office buildings, 65 to 85 percent of the front façade shall be glazed, exclusive of the parapet wall. Reflective or tinted glass shall be prohibited.~~

(vi) For buildings having a residential character, a minimum of 25 percent of the façade area shall be covered with window and door openings. Storefronts with generous amounts of window and door transparency properly located and proportioned animate the streetscape by providing visual interest for pedestrians.

Figure ~~3-13~~ 3-15: The homes shown above are located in Harlinsdale Manor and serve as a good example of architectural style and character that would be appropriate in CAO 5.

(i) Building Materials

(i) ~~For commercial, office, institutional, and mixed-use buildings, brick or stone shall comprise a minimum of 75 percent of the primary building materials. For accent purposes, stone, cast stone, cement-based stucco, and split-faced concrete block shall be permitted.~~

(ii) For residential buildings, either brick, wood siding, or fibrous cement siding that closely resembles wood siding, shall **be** ~~comprise at least 50 percent of~~ the primary building material. Cast stone, stone, and cementitious materials shall be permitted and are encouraged as accents to the primary building material.

(iii) ~~Vinyl, aluminum siding, EIFS, and smooth-face block, and other synthetic materials shall be prohibited.~~

(j) Parking and Access

(i) ~~Off-street parking areas are prohibited from being located between the building and any public street.~~

(ii) Parking shall not be permitted between the building facade and Columbia Avenue, regardless of the building's setback, ~~unless a 30-foot buffer designed in accordance with Subsection 3.4.7(8)(e), Rural Gateway Buffer, is provided around the entire parking lot, except where the parking is contiguous to a building.~~

(iii) Parking is permitted on the side **and rear** of the building, provided that it complies with the landscaping and screening standards of Chapter 5: Development Standards.

SECTION II. BE IT FINALLY ORDAINED by the Board of Mayor and Aldermen of the City of Franklin, Tennessee, that this Ordinance shall take effect from and after its passage on third and final reading, the health, safety, and welfare of the citizens requiring it.

ATTEST:

By: _____

Eric Stuckey
City Administrator/Recorder

CITY OF FRANKLIN, TENNESSEE:

By: _____

Dr. Ken Moore
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

PLANNING COMMISSION RECOMMENDED: _____

PASSED FIRST READING: _____

PUBLIC HEARING HELD: _____

PASSED SECOND READING: _____

PASSED THIRD READING: _____

RESOLUTION 2016-22

A RESOLUTION, AS AMENDED, ADOPTING A PLAN OF SERVICES FOR THE ANNEXATION OF 1845 CARTERS CREEK PIKE BY THE CITY OF FRANKLIN, TENNESSEE.

WHEREAS, *Tennessee Code Annotated* (T.C.A.) § 6-51-102 requires that a plan of services be adopted by the municipal governing body prior to passage of an annexation ordinance.

1845 CARTERS CREEK PIKE

The proposed annexation area of 75.69 acres located west of Carters Creek Pike and southwest of Downs Boulevard and adjoining the City limits within the southwestern part of the Franklin Urban Growth Boundary (UGB). A map is attached as Exhibit A. The area comprises a total of 75.69 acres in one parcel with one owner, Heavy Helium, LLC ("Owner"). The Applicant Monte and Camille Schaefer are in process of purchasing the property from the Owner. The Applicant has requested annexation by the City of Franklin. The area currently is vacant ("Property").

WHEREAS, the Property is contiguous to the City of Franklin City limits.

WHEREAS, it is believed in the best interest of the City of Franklin to annex such area to provide for future development in accordance with City standards.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

Section 1. Pursuant to the provisions of T.C.A. § 6-51-102, there is hereby adopted, for the area bounded as described above, the following Plan of Services:

Water

The Property is located within the City of Franklin Utility District. The existing/proposed zoning is Agricultural. As long as the proposed use remains agricultural, the Property Owner shall be allowed to utilize the existing well water onsite and the City of Franklin will not be responsible for providing water service.

If the existing/proposed use of the Property changes, the Property Owner shall be responsible for the engineering, design and construction of a public water main. Currently this would require an extension from the intersection of Bradford Drive and West Main Street along Carters Creek Pike and shall be extended across the frontage of their Property (approximately 1,900 LF). It shall be the responsibility of the Property Owner to ensure that adequate water for both domestic use and fire protection is provided to the site. The City does not allow water mains within state right-of-way. The Property Owner shall be required to acquire the necessary offsite easements to provide service to the Property.

Reclaimed Water

According to the City of Franklin's Municipal Code, reclaimed water systems need to be extended to a development if the development is within 1,000 feet of an existing reclaimed

Law Dept. approved 04.28.16

water line. In the case of this Property, a several-mile extension would be required to serve the Property. For this reason, reclaimed water will not be required to be extended to the Property.

Wastewater

The majority of the Property lies within the West Basin as defined in the City of Franklin Sanitary Sewer Basin Study. The Property Owners are anticipated to construct a horse barn, a track building, an indoor riding ring, and three care-taker apartments creating very little impact on the sanitary sewer collection system. The existing/proposed zoning is Agricultural. As long as the existing/proposed use remains agricultural, the Property Owner shall be allowed to construct and operate a septic system approved by Williamson County Board of Health.

The City Administrator may require the Property Owner to connect to the public sanitary sewer system based on the following reasons:

1) The proposed/existing use changes and increase the impact on the proposed septic system.
2) The Property Owner's private sewage disposal system no longer complies with the Williamson County Board of Health regulations.
3) The conditions on the Property pose an unacceptable risk to the public health, safety and welfare.

If the Property Owner is required to connect to the public sewer system they will be responsible for the engineering, design, easement acquisition, connection fees and construction of the public main. The time frame associated with this connection shall be determined by the City Administrator.

Stormwater

The Property Owner shall be responsible for the engineering, design and construction of the necessary stormwater infrastructure for the development of the property and shall comply with all requirements as outlined in the Franklin Municipal Code. As the Property develops, the City of Franklin will charge prevailing stormwater user fees per policies and procedures as outlined in the Franklin Municipal Code.

Streets

Access to the Property shall be provided on Carters Creek Pike. Carters Creek Pike is classified as a Minor Arterial in the City of Franklin Major Thoroughfare Plan. The Property Owner shall be required to dedicate the necessary future right-of-way for Carters Creek Pike to allow the City to make future improvements as this area of the City continues to develop. The Property Owner shall be required to dedicate 67.5 feet of right-of-way from the existing centerline of Carters Creek Pike as part of the final plat.

The future extension of Mack Hatcher Parkway goes through the western portion of this Property. The Property Owner shall be required to reserve 225 feet of right-of-way following the proposed centerline of the Mack Hatcher Parkway Extension project. This shall be completed as part of the final plat.

The Property Owner shall be required to complete a traffic impact study as part of the development of this property. Additional requirements will be determined as part of the site plan review and approval process.

Traffic Control

Traffic signals, traffic signs, street markings, and other traffic-control devices will be installed as the need is established by appropriate study and traffic standards. New development after the effective date of annexation shall comply with City regulations governing traffic markings.

Street Lighting

No off-site street lighting is proposed. Street lighting within new developments shall be funded and installed by the Property Owner per City policy.

Street Name Signs

No additional street name signs in the area have been deemed necessary. New development shall install street-name signs per City policy.

Planning and Zoning

The Planning and Zoning jurisdiction will extend to the annexed area on the effective date of the annexation. City Planning will thereafter encompass the annexed area.

Fire Protection

Fire protection by the present personnel and equipment of the Franklin Fire Department will be provided on and after the effective date of annexation. No additional staffing or equipment will be necessary to serve the annexation area at this time. Fire protection will be provided by the City of Franklin, TN. Due to the proposed agricultural use, the site will not have public water available for fire suppression. All agricultural buildings shall be built out of non-combustible material. Any proposed residential units shall have a sprinkler system connected to the proposed well.

Police Protection

Police patrol and response to calls by the Franklin Police Department will be provided on and after the effective date of annexation. Police services will be provided with existing personal and equipment.

Building and Code Inspection Services

Any Building and Code inspection services will begin in the annexed area on the effective date of annexation. New development after the effective date of annexation shall comply with City building codes. New development shall pay all applicable fees and permits for inspection services.

Garbage and Recycling Pickup and Environmental

The Sanitation Department will begin pick-up, per their regulations, on the effective day of annexation.

City of Franklin Land Use Plan

SOUTHALL CHARACTER AREA

The Southall Character Area straddles Carters Creek Pike and Columbia Avenue to the southwest and south of downtown Franklin. To the north, the area is bound by the West Harpeth and Central Franklin Character Areas, to the east by the Carnton and Goose Creek Character Areas and to the south and west by the UGB. There are approximately 4,230 acres in the area, and large residential lots and vacant land account for a majority of that acreage. There are almost 400 acres dedicated to industrial uses, which is more than half of the region's total (although much of this is the rock quarry), and there is also some commercial and office space. There is no

Attached Residential in this area. Rolling Meadows Subdivision, in the adjacent West Harpeth Character Area, is an example of a desirable affordable neighborhood. Affordable housing is an important element that should be provided for in the area. The lack of sewer infrastructure limits residential development in the southern portion of the area, unless advanced on-site technology is permitted. Other areas of inadequate infrastructure include the need for additional collector roads necessary to access undeveloped pockets of land. The Southall Character Area has rich natural resources including rolling terrain with significant areas constrained by steep slopes (twenty percent or greater), hilltops and significant mature tree cover that provides habitat for wildlife. These features should be preserved to the greatest extent possible to maintain the environmental quality and scenic views within the area. The Lula Lane incinerator is no longer operating and provides an opportunity for redevelopment. Whenever possible, opportunities to create parks and to preserve open space should be pursued. Connectivity of these elements as part of a regional network is important.

SPECIAL AREA 4
1. This area shall have vehicular and pedestrian connections to Westhaven and Willow Springs PUD Subdivisions.

VISION
The Southall Character Area will remain semi-rural with strong preservation of natural features, particularly of hillsides and hilltops. Development will respect and enhance the character of the area while creating neighborhoods and preserving natural features, such as steep slopes, hilltops and floodplains.

SECTION 2. This Resolution shall be effective from and after its adoption.

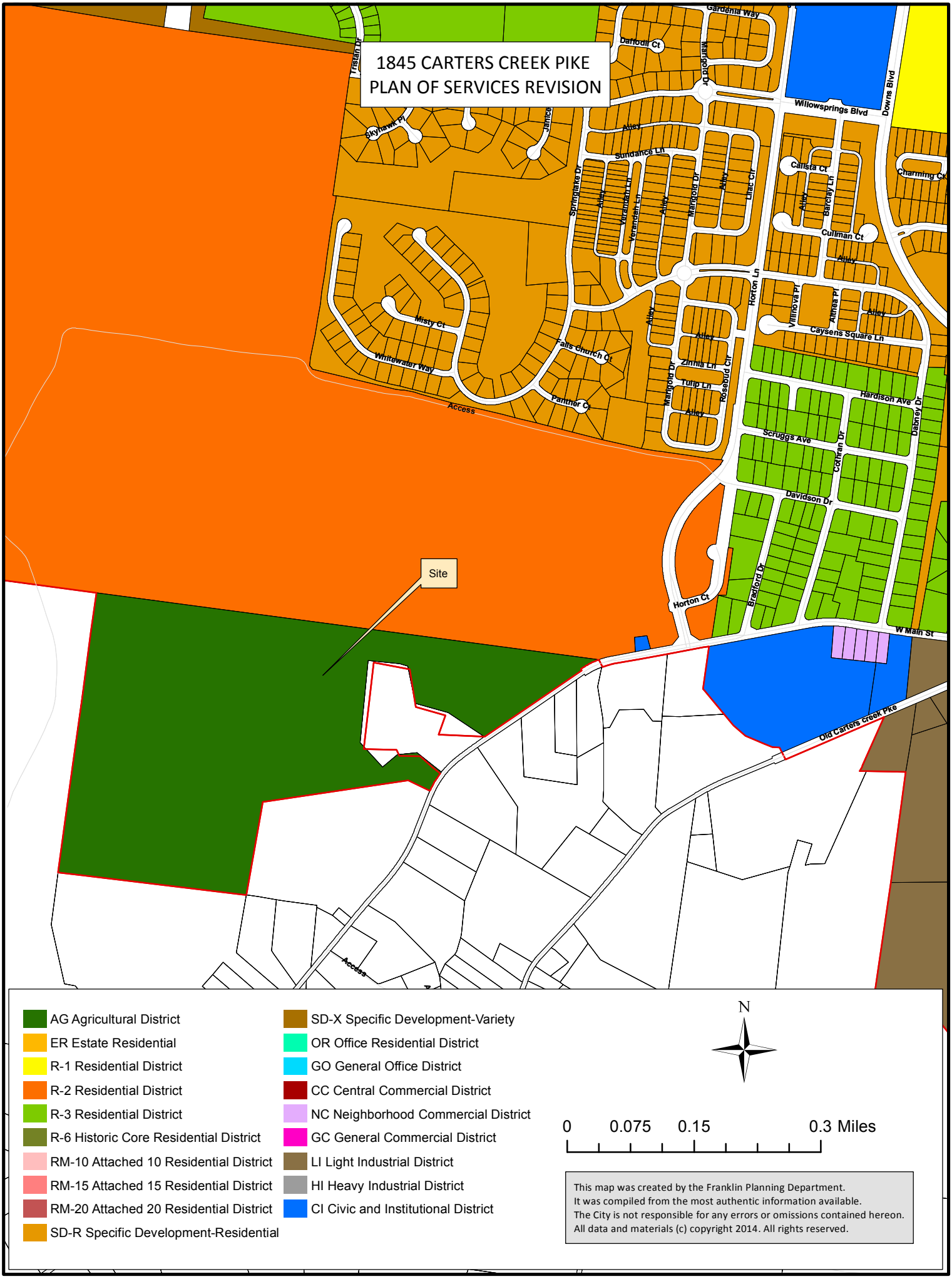
ADOPTED THIS _____.

_____ _____

ERIC S. STUCKEY **DR. KEN MOORE**
City Administrator Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney


1845 CARTERS CREEK PIKE
PLAN OF SERVICES REVISION
Site
Access
Access
Gardenia Way
Daffodil Ct
Marigold Dr
Willowsprings Blvd
Downs Blvd
Skyhawk Pl
Janice
Alley
Sundance Ln
Springlake Dr
Veramedan Cir
Lilac Cir
Callista Ct
Barclay Ln
Charming Ck
Cullman Ct
Horton Ln
Misty Ct
Whitewater Way
Falls Church Ct
Panther Ct
Zinnia Ln
Tulip Ln
Rosebud Cir
Villinova Pl
Almea Pl
Caysens Square Ln
Hardison Ave
Dabney Dr
Scruggs Ave
Cothran Dr
Davidson Dr
Bradford Dr
Horton Ct
W Main St
Old Carters Creek Pike
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 Historic Core Residential District
RM-10 Attached 10 Residential District
RM-15 Attached 15 Residential District
RM-20 Attached 20 Residential District
SD-R Specific Development-Residential
SD-X Specific Development-Variety
OR Office Residential District
GO General Office District
CC Central Commercial District
NC Neighborhood Commercial District
GC General Commercial District
LI Light Industrial District
HI Heavy Industrial District
CI Civic and Institutional District
N
0
0.075
0.15
0.3 Miles
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