City of Franklin

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

Meeting Agenda

Work Session

Tuesday, September 13, 2016 | **5:00 PM** | **Board Room**

Call to Order

Citizen Comments

WORKSESSION DISCUSSION ITEMS

1. 16-0753 Consideration of Event Permit for Pumpkinfest Sponsored by the Heritage Foundation in Downtown Franklin on October 29, 2016 (09-13-16 WS).

Sponsors: Deb Faulkner

Attachments: Pumpkinfest 2016 REVISED App

2. 16-0754 Consideration of Event Permit for Light the Way for Team Elliott at Eastern Flank Battlefield Park on October 2, 2016. (09-13-16 WS)

Sponsors: Lisa Clayton

Attachments: Light the Way 2016 REVISED App

3. 16-0612 Consideration Of Ordinance 2016-29, To Be Entitled, "An Ordinance To Amend The Zoning Ordinance Of The City Of Franklin, Tennessee, To Amend Chapter 3, Section 3.4.5, Floodway Fringe Overlay (FFO) District, In Order To Add The Use, Boutique Hotels, Located In CFCO-1, To The List Of Permitted Uses And Amend Section 3.2.3, Use Table, Table 3-2, Permitted Uses, In Order To Revise The Additional Requirements For Boutique Hotels." (08/25/16 FMPC Recommended for Disapproval 8-0)

Sponsors: Ald. Ann Petersen

Attachments: Ordinance 2016-29_FFO Amendment_Boutique Hotels_Law Approved 8 3

CFCO FFO 07282016 Staff Presentation

Legislative History

7/28/16	Franklin Municipal Planning Commission	deferred
8/25/16	Franklin Municipal Planning Commission	recommended unfavorably to the Work Session

4. 16-0650 Consideration of Ordinance 2016-32, To Be Entitled, “An Ordinance To Rezone 5.3 Acres From Heavy Industrial District (HI) And Detached Residential 3 District (R-3) To Specific Development Residential (SD-R 7.55) District For The Property Located South Of Avondale Drive And East Of Columbia Avenue, 302 Avondale Drive. (08/25/16 FMPC 8-0, 9/13/16 WS, 1st BOMA Reading 09/13/16 8-0; 10/11/16 2ND Reading 8-0) THIRD AND FINAL READING

Sponsors: Ald. Ann Petersen

Attachments:
ORD 2016-32 Rezoning South of Avondale Drive and East of Columbia Avenue
6196 Avondale Cottages PUD Subdivision Rezoning.pdf
2016-08-04 Avondale RZN Set.pdf
Citizen Comment Avondale Cottages Mr and Mrs Henry

Legislative History

8/25/16	Franklin Municipal Planning Commission	recommended favorably to the Board of Alderman and to the Work Session

5. 16-0651 PUBLIC HEARING: Consideration of Resolution 2016-46, To Be Entitled: “A Resolution Approving A Development Plan For Avondale Cottages PUD Subdivision, For The Property Located South Of Avondale Drive And East Of Columbia Avenue, 302 Avondale Drive.” (08/25/16 FMPC 8-0; 09/13/16 WS)

Sponsors: Ald. Ann Petersen

Attachments:
RES 2016-46 Rezoning South of Avondale Drive and East of Columbia Avenue
6197 Avondale Cottages DP Conditions of Approval_01.pdf
2016-08-04 Avondale PUD Set.pdf
Citizen Comment Avondale Cottages Mr and Mrs Henry

Legislative History

8/25/16	Franklin Municipal Planning Commission	recommended favorably to the Board of Alderman and to the Work Session

6. 16-0666 Consideration Of Ordinance 2016-44, To Be Entitled, “An Ordinance To Rezone 2.90 Acres From General Commercial District (GC) to Civic and Institutional District (CI) For The Property Located North Of Murfreesboro Road And West Of Edward Curd Lane. (08/25/16 FMPC 8-0, 9/13/16 WS and 1st BOMA Reading 8-0; 10/11/16 2nd Reading 8-0) THIRD AND FINAL READING

Sponsors: Ald. Ann Petersen

Attachments:
ORD 2016-44 Williamson Medical Center Rezoning_with Map Law Approved
Williamson Medical Center, rezoning request

Legislative History

8/25/16	Franklin Municipal Planning Commission	recommended favorably to the Board of Alderman and to the Work Session

7. 16-0688 Consideration Of Ordinance 2016-34, To Be Entitled, “An Ordinance To Rezone 19.99 Acres From Civic-Institutional (CI) District To Specific Development Residential 13.5 District And Remove The Scientific Research Zoning Overlay For The Property Located North Of Mack Hatcher Parkway And East Of Franklin Road, 145 Legends Club Lane.”(Iron Horse); (08/25/16 FMPC Recommended Disapproval 5-1 with 1 abstention; 09-13-16 WS; 09-27-16 1ST BOMA Reading 8-0; BOMA PUBLIC HEARING and 2nd Reading Deferred to November 22, 2016, 7-1; 11/22/16 2ND READING 7-1) THIRD AND FINAL READING

Sponsors: Ald. Ann Petersen and Josh King

Attachments: ORDINANCE 2016-34 Ironhorse_Rezoning_with Map Law Approved

Legislative History

8/25/16	Franklin Municipal Planning Commission	recommended unfavorably to the Work Session

8. 16-0687 PUBLIC HEARING: Consideration of Resolution 2016-50 To Be Entitled: “A Resolution Approving A Development Plan For Ironhorse PUD Subdivision With 1 Modification of Development Standards (Exceed Building Height Of 2 Stories), For The Property Located North Of Mack Hatcher Parkway And East Of Franklin Road, 145 Legends Club Lane.” (08/25/16 FMPC recommended for Disapproval 6-1; 9/16/16 WS; Deferred for Public Hearing on November 22, 2016 6-2).

Sponsors: Ald. Ann Petersen and Josh King

Attachments: 2016-50 RES Ironhorse PUD Development Plan_with Map Law Approved

IronhorseLayout.pdf

Ironhorse_Views.pdf

IronhorseElevations.pdf

8.4.2016 Iron Horse Dev Plan Drawing Set.pdf

LandUsePlanSection

6194_Conditions of Approval_02.pdf

Ironhorse Support Letter

2016IronHorseLetter_II.pdf

2016-50 Ironhorse PUD Development Plan.docx

Legislative History

8/25/16	Franklin Municipal Planning Commission	recommended unfavorably to the Work Session

9. 16-0581 *Consideration of Resolution 2016-62, A Resolution to Finalize the Design and Construction for the Lewisburg Pike (U.S. 431) Roadway Project (08/23/16 WS).

Sponsors: Paul Holzen

Attachments: Res 2016-62 Lewisburg Pike Access Issues_with Exhibit A.Law Approved

Martocci Letter 7-27-2016

Access Option 8-25-2016

Denton, Josh_Letter_to_BOMA re Harlan

Legislative History

8/23/16	Work Session	acknowledged

10. 16-0758 *Consideration of Resolution 2016-56: A Resolution Awarding the Construction Contract (COF Contract No 2014-0288) To Revere Control Systems, Inc. In The Amount Of $1,949,980.00 for the Water Distribution & Collection System SCADA Improvements Project

Sponsors: Paul Holzen, Mark Hilty and Patricia McNeese

Attachments: Res 2016-56 SCADA Bid Award.Law Approved

2016-08-18 Franklin SCADA Improvements Bid Eval Letter and Tabulation

11. 16-0733 *Consideration of Resolution 2016-58 Authorizing City of Franklin Contract 2016-0265 with the State of Tennessee for the Clean Tennessee Energy Grant in the Amount of $250,000 for Components of the Proposed Water Reclamation Facility Upgrades

Sponsors: Mark Hilty

Attachments: Resolution 2016-58_Clean TN Grant.Law Approved

COF Contract 2016-0265 Law Approved 082316

12. 16-0752 Consideration of Resolution 2016-59, A Resolution Adopting and Updating the Bicentennial Park Master Plan (8-25-2016 CIC 3-1; (09-27-16 WS)

Sponsors: Lisa Clayton, Paul Holzen and Jonathan Marston

Attachments: 16-0752 Res 2016-59 Bicentennial Park Master Plan Update_with Map - Law A

Transmit Bicentennial Schematic to Lisa 8_10_16

13. 16-0785 Consideration of Resolution 2016-61, A Resolution Funding the Design, Right-of-Way Acquisition and Construction for the Mallory Lane, North Royal Oaks Blvd and Liberty Pike Intersection Project.

Sponsors: Paul Holzen

Attachments: Res 2016-61 - Memo Exhibits

Res 2016-61 - Resolution to fund improvements to Liberty Pike and Mallory Lan

14. 16-0705 Consideration of Contract 2016-0229 Contract Between the City of Franklin, Tennessee and Tennessee Fair Housing Council, Inc. for the Fair Housing Education and Outreach Program (09-13-16 WS)

Sponsors: Building and Neighborhood Services (BNS) and Chris Bridgewater

Attachments: Contract 2016-0229 Tennessee Fair Housing Council

15. 16-0715 Consideration Of Resolution 2016-53, A Resolution Of Modification To The Police Department Organization Chart (09-13-16 WS)

Sponsors: Deb Faulkner

Attachments: Resolution 2016-53

16. 16-0761 Consideration Of Amendment 1 To COF Contract No. 2016-0096, A Contract Between The City Of Franklin And Middle Tennessee State University For The Design And Fabrication Of 10 Interpretive Markers For The Carter Hill Battlefield Site, to Extend the Term of the Contract. (09-13-16 WS)

Sponsors: Lisa Clayton

Attachments: COF Contract NO. 2016-0096 Extension

2016-0096 Amendment 1_Carter's Hill Park signage_time extension.Law Appr..

17. 16-0718 Discussion of Financing Model for Capital Investment Plan

Sponsors: Eric Stuckey and Russ Truell

Attachments: Franklin Debt Capacity Update 8 12 2016

Capital Funding Model - September 2016 09-09-16.pdf

CIP Funding Model - BOMA - 09132016 09-09-16.pdf

Legislative History

8/23/16	Work Session	acknowledged

Other Business

Adjournment

Anyone requesting accommodations due to disabilities should contact ADA coordinator at 791-3277.

OFFICE USE ONLY
Permit No:
_____

HISTORIC
FRANKLIN
TENNESSEE

City of Franklin
Special Event Permit Application

Application is Due 90 ***Days Prior*** *to Scheduled Event.*
Please read application carefully and fully complete each section.
A non-refundable application fee of $100 is due at time of filing.

Note: Filing this application does not guarantee that you request will be granted.

Please list all that apply:

- Festival/Fair

1. **Name/purpose of event:** 33rd Annual Pumpkinfest
2. **Location Requested:** *(if Temporary Street Closure, list major roads to be closed)***:**
   Main Street from 1st to 5th Avenue and portions of 2nd, 3rd, and 4th Avenues.
3. **Date or dates of event:** 10/29/2016
4. **Start/End Times of Event:** 10 a.m. - 8 p.m.
   What date/time will set-up begin? 10/28/2016 5:00 AM
   What date/time will tear-down be complete? 10/29/2016 10:00 PM
   **Note: Event is responsible for cost of staff required during this time (including Franklin Police Officers). Read Additional Requirements section for more information).*
5. **Time of Street Closure** *(if applicable)***:** Set Up: Close 4th Avenue at 5 a.m. on 10/28; close Public Square parking at 5 a.m. on 10/28; close Main Street and Public Square to traffic at 8 p.m. on 10/23. We would love for 'No Parking After 3 p.m.' signs to go up the morning on 10/28 on Main Street.

   Tear Down: 6 p.m. on 10/29 for all except Public Square Stage. Public Square Stage tear down at 7:45 p.m./ 8:00 p.m. on 10/29.
6. **An estimated number expected to attend during the course of the event:**
   Spectators/Attendees: 65,000 Event Staff/Volunteers:75 Total:65,075
7. **Name of applicant and Organization Requesting Permit:**
   Abby Williams - Heritage Foundation of Franklin and Williamson County
   a) Address: 134 2nd Ave
   Franklin, TN 37065
   b) Phone: 6155918500 **c) Cell:** **d) Fax:**
   e) E-mail address: awilliams@historicfranklin.com
8. **DETAILED description of event** *(use additional sheets)***:**
   The 33rd Annual Pumpkinfest is a family-friendly free fall-themed street festival. One big stage fully equipped will be on the Public Square quadrant between Capital Bank and Redo (same place it was at Main Street Festival 2015). We will have one 12' x 12' platform at 1st and Main for amplified street performances. A beer tent will be set up on 4th Avenue South with another 12' x 12' platform for performances and amplified sound. We will have circus performers at the corner of 2nd and Main Street (South) and will be adding a few more vendors to go down 2nd Avenue North that will end before the Landmark Bank driveway.

9. **ENCLOSE A DETAILED MAP** of event site and/or route, detailing any temporary or permanent structures, street closures, parking, etc. If applicable, list the location, blocks, streets, and/or intersections in which such event will occur. ***For large-scale events, map should be obtained from the Citys GIS division***

   Please detail any restricted parking areas on the event map.

   Event Map: pfest drawn map for application.pdf

10. **Person in charge on day of event:** Teryl O'Connor
    Cell: 615-525-3101 **E-mail address:** toconnor@historicfranklin.com

11. **Name and Cell Number of at least two others available on day of event:**
    Name: Abby Williams **Cell:** 615-630-2018 **E-mail address:** awilliams@historicfranklin.com
    Name: Mary Pearce **Cell:** 615-300-7218 **E-mail address:** mpearce@historicfranklin.com

12. **Please attach a list** containing the names, addresses, and phone numbers of the Chairperson of the organization and all other persons involved in the management or control of organization and/or committee.

    Administrative Contact List: HF contacts.jpg

13. **Where is your organization based?** Williamson County

14. **Is your organization authorized to do business in Tennessee?** Yes

15. **Is your organization a tax-exempt organization as described by the Internal Revenue Code Section 501(c)(3) or a not-for-profit organization?** Yes
    IRS tax exemption letter: tax exempt file.pdf

16. **Will you charge an admission fee?** No
    Average admission fee:

17. **Will you charge a vendor particiation fee?** Yes
    Average vendor participaion fee? 200-15000

18. **Total Estimated Revenue from vendors, ticket sales, and sponsorship to event organizer:**

19. **Will any charity, gratuity, or offers be solicited or accepted during the event?** Yes

20. **Is this event a fundraiser?** Yes
    What organization will be the benefactor of event? Heritage Foundation of Franklin and Williamson County
    What percentage of funds will they receive? 100

21. **Will parking in the area of the event need to be restricted or prohibited?** Yes

22. **Will any sound amplification equipment be used during the event?** Yes

23. **Applicant must also include a copy of that company's insurance certificate indicating coverage and listing the City of Franklin as additional insured.**

    ***For stages, tents, inflatables, etc. constructed on site prior to the event, that date must be included on Certificate of Insurance provided to the City of Franklin. Stages MUST be removed from site at end of event. ***Rented inflatables/interactives that are set-up and manned by applicant must be included specifically in applicant's Certificate of Insurance.

    If you already have your insurance certificate, please upload it now. Otherwise your insurance certificate will need to be submitted before your event is approved.

    Insurance Certificate:

24. **What, if any, vendors will be present at event?** (i.e. medical related, shirts, arts, etc.) **Please provide detailed list**. Arts and Crafts Vendors, Food Vendors, and Sponsor Booths

25. **Will food, beverages, or merchandise be sold or given away?** Yes
Clean-up of the area is required. Please attach your clean-up and recycling plan, including name of clean-up provider with contact information for person who will be on on-site during event. See Question #26.
Clean Up Plan and Provider: Clean Up Plan pfest 2016.docx

26. Events under 200 participants require a $250 refundable security deposit at the time of approval. For events over 200, a $1000 security deposit is required upon approval. If the applicant fails to restore the property to its prior condition, then the applicant shall be responsible to the City of Franklin for any costs incurred in restoring the property after the event. Surrender of the deposit in no way relieves the applicant of the responsibility for any costs incurred by the City of Franklin in excess of the deposit. Applicant's event coordinator or representative and a City of Franklin representative will conduct a Pre-Event meeting prior to event date for Pre-Event Check List Site Review. *At the end of the event, a Post-Event Check List shall be completed by the Applicant's event coordinator, or representative, and a City of Franklin representative to re-assess the site for trash and damage, and to secure with caution tape and signage (provided by event group) any tents left for removal.* Damage deposit will be refunded after a satisfactory Post Event Check List has been completed and signed off on by both the City of Franklin and organization requesting event. **NOTE*: Events that include deep frying cooking oil operations are required to have a grease pit on-site and contract with a grease waste hauler to handle the grease waste and removal of the grease pit. A copy of this agreement shall be filed along with this application. The primary event sponsor is required to remove all cooking grease from the site immediately after the event. Illegal dumping of cooking grease will be prosecuted. *Please read Additional Requirements section of this application for more information.*

27. **Will you require a temporary water tap?** Yes
If yes, please list exact locations: at 4th and Main and at 3rd Avenue South

28. **Will alcohol, beer, and/or wine be given away or sold?** Yes
If yes, a permit from the relevant board is required. Please read Additional Requirements section of this application for more information.

29. **Will your event include tents or other temporary structures, propane use, or open flames?** Yes
Tents 400 sq. ft. or larger (or, if cooking operations are under the tent, 200 sq. ft. or larger) require permitting from Franklin Fire Department. Safety measures must be provided on all tents, especially those set-up prior to the actual event. Tents should be taken down the date the event has ended. *Please read Additional Requirements section of this application for more information.*

30. **Attach Good Neighbor Letter and Mailing List used.** *Please read Additional Requirements section of this application for more information.*
Good Neighbor Letter: good neighbor letter.docx
Good Nieghbor Letter Mailing List: good neighbor letter.docx

HISTORIC
FRANKLIN
TENNESSEE

Rules and Regulations

Please Read All Attachments Before Signing Application.

1. I/We agree to abide by all ordinances and regulations of the City of Franklin and all conditions placed upon the event by the City Administrator and the Board of Mayor and Aldermen.
2. I/We do swear or affirm that all of the information given in this application is true and complete.
3. I/We do hereby agree to assume the defense of and indemnify and save harmless the City, its mayor, aldermen, boards, commissions, officers, employees and agents, from all suits, actions, damages or claims to which the City may be subjected of any kind or nature whatsoever resulting from, caused by, arising out of or as a consequence of such event and the activities permitted in connection there with.
4. I/We agree to submit a certificate of insurance prior to the event in an amount determined by the City naming the City of Franklin and its employees as additional insured. The City may require the sponsor and/or vendor provide higher levels of insurance, coverage, and policies as deemed reasonable and necessary based on specific event risk factors and review by the City's insurer.
5. I/We agree, if holding the special event on City property, to return the site to its pre-event condition at the conclusion of the event.
6. I/We agree to provide a copy of the signed Event Application to any vendors, planners, and related parties associated with the event to ensure they are familiar with the guidelines set forth herein.
7. I/We understand that I/we assume the responsibility of the actions of any vendors, planners, and related parties for this event.
8. I/We understand that granting of Special Event Permit does not imply granting of other permits that are separately required.
9. The application for an event permit shall be filed not less than 90 days nor more than 364 days prior to the scheduled date of such event. Suggested filing is at least 180 days prior to scheduled event. Events should not be advertised or promoted until an event permit has been obtained from the City. Failure to file in a timely manner may result in denial of a permit.
10. I/We understand that event permit holders may be responsible for 100 percent of the costs incurred by the City for staff time and resources.

By:_____ Date:_____
(Signature and title – must be officer of organization)

Approved by the Board of Mayor and Aldermen on_____, 20_____.

_____
Dr. Ken Moore, Mayor

_____
Eric S. Stuckey, City Administrator

Return application to:

City Administrator's Office
City Hall
109 Third Ave South
Franklin, TN 37065
615-791-3217
615-790-0469 (FAX)

HISTORIC
FRANKLIN
TENNESSEE

Buildings, Structures, & Power Sources

If your special event includes any of the following, you may need to obtain a permit from the Building and Neighborhood Services Department. Please check any that apply.

- Any site-built platforms (stages) and/or bleachers
- Any electrical work utilizing site-constructed equipment or wiring
- Any electrical equipment or work utilizing in excess of 120 volts

Building permits and/or inspections also may be required whenever deemed necessary, due to unique conditions, shoddy construction, substandard assembly or set-up, unqualified assemblers, lack of maintenance, or dilapidation of equipment, materials or systems.

All Permit applications are subject to permit fees.

If you have any questions about whether you need to apply for a permit from the Building & Neighborhood Services Department, please call 615-794-7012.

Event Name: 33rd Annual Pumpkinfest

Signature: _____

HISTORIC FRANKLIN TENNESSEE

FORM 1

Sound Amplification

In accordance with Title 11 Chapter 4 of the Franklin Municipal Code (*Offenses Against the Peace and Quiet*), amplification of sound located in or within 100 feet of a residential property line which is plainly audible is prohibited between the hours of 10:00 p.m. and 7:00 a.m. Sunday through Thursday and between the hours of 11:00 p.m. and 7:00 a.m. Friday and Saturday except for special events where a special permit has been obtained from the City of Franklin authorizing such event. In the event that a special event permit has been obtained from the City of Franklin, no other amplification of sound will be permitted within the area of the special event except that which has been applied for and authorized by the city pursuant to the permit application.

Applicant/Organization: Abby Williams - Heritage Foundation of Franklin and Williamson County
Event Name: 33rd Annual Pumpkinfest
Event Date(s): 10/29/2016

1. **Time amplification equipment will be used:** From: 10:00 AM To: 8:00 PM
2. **Exact locations sound amplification equipment will be used** *(i.e. stage located on Second Avenue). Provide map/layout if necessary.*:
   Stage on the Public Square, 1st and Main 12x12' platform , and beer tent at 4th Avenue South 12 x 12' platform
   Sound Amplification Map: pfest drawn map for application.pdf
3. **For what purpose will sound amplification be used?** *Please list all that apply*:
   - Announcements/Speeches
   - Band/Singers
   - Sound System
4. **Type of Amplifier:**
   - Fixed
5. **Number of Amplifiers:** 50 **Number of Speakers:** 10 **Number of Performers:** 30
6. **Name and Cell Number of at least two coordinators who will monitor the sound level and respond to complaints and violations:**
   Name: Abby Williams **Cell:** 615-630-2018 **E-Mail:** awilliams@historicfranklin.com
   Name: Teryl O'Connor **Cell:** 615-525-3101 **E-Mail:** toconnor@historicfranklin.com

Authorized Signature: Abby Williams **Date:** 06/10/2016

The City of Franklin's Municipal Code (Title 11, Chapter 4) allows for exceptions to the City's noise standards for City authorized or sponsored events. However, the City retains the right to ask for a change of an event's location or time in an attempt to decrease the number of people impacted by event noise. The City may refuse a special event application based on noise complaints by neighboring businesses and residents. The City therefore encourages event-holders to work with neighbors to alleviate negative impacts wherever possible. At minimum, you should plan to point speakers away from residences.

Clean Up Plan – The City of Franklin Department of Sanitation

jay@sheridanpr.com

Macey Baird
macey@sheridanpr.com

Holly Albright
holly@sheridanpr.com

Liz Brittain
liz@sheridanpr.com

HERITAGE FOUNDATION CONTACT LIST

Executive Director
Mary Pearce
615.591.8500, Ext. 15
mpearce@historicfranklin.com

Main Street Director for Franklin
Kristy Williams
615.591.8500, Ext. 18
kwilliams@historicfranklin.com

Art Scene Coordinator
Linda Childs
615.591.8500, Ext. 16
lchilds@historicfranklin.com

Heritage Ball Manager
Lynne McAlister
615.591.8500, Ext. 20
lmcalister@historicfranklin.com

Accountant
Wendy Dunavant
615.591.8500, Ext. 13
wdunavant@historicfranklin.com

Historian
Rick Warwick
615.591.8500, Ext. 14
rwarwick@historicfranklin.com

Festival Director/Vendor Director
Rene Evans
615.591.8500, Ext. 11
revans@historicfranklin.com

Festivals
Abby Good Williams
615.591.8500, Ext. 17
awilliams@historicfranklin.com

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TENNESSEE

Rules and Regulations

Please Read All Attachments Before Signing Application.

1) I/We agree to abide by all ordinances and regulations of the City of Franklin and all conditions placed upon the event by the City Administrator and the Board of Mayor and Aldermen.

2) I/We do swear or affirm that all of the information given in this application is true and complete.

3) I/We do hereby agree to assume the defense of and indemnify and save harmless the City, its mayor, aldermen, boards, commissions, officers, employees and agents, from all suits, actions, damages or claims to which the City may be subjected of any kind or nature whatsoever resulting from, caused by, arising out of or as a consequence of such event and the activities permitted in connection there with.

4) I/We agree to submit a certificate of insurance prior to the event in an amount determined by the City naming the City of Franklin and its employees as additional insured. The City may require the sponsor and/or vendor provide higher levels of insurance, coverage, and policies as deemed reasonable and necessary based on specific event risk factors and review by the City's insurer.

5) I/We agree, if holding the special event on City property, to return the site to its pre-event condition at the conclusion of the event.

6) I/We agree to provide a copy of the signed Event Application to any vendors, planners, and related parties associated with the event to ensure they are familiar with the guidelines set forth herein.

7) I/We understand that I/we assume the responsibility of the actions of any vendors, planners, and related parties for this event.

8) I/We understand that granting of Special Event Permit does not imply granting of other permits that are separately required.

9) The application for an event permit shall be filed not less than 90 days nor more than 364 days prior to the scheduled date of such event. Suggested filing is at least 180 days prior to scheduled event. Events should not be advertised or promoted until an event permit has been obtained from the City. Failure to file in a timely manner may result in denial of a permit.

10) I/We understand that event permit holders may be responsible for 100 percent of the costs incurred by the City for staff time and resources.

BY: Teryl O'Conner Digitally signed by Teryl O'Conner DN: cn=Teryl O'Conner, o=Heritage Foundation, ou, email=toconner@historicfranklin.com, c=US Date: 2016.06.10 11:08:55 -05'00' Date: 6/10/2016

(Signature and title – must be officer of organization)

Approved by the Board of Mayor and Aldermen on _____, 20____.

_____

Dr. Ken Moore, Mayor

_____

Eric S. Stuckey, City Administrator

Return application to:

City Administrator's Office
City Hall
109 Third Ave South
Franklin, TN 37065
615-791-3217
615-790-0469 (FAX)

TENNESSEE DEPARTMENT OF REVENUE

Certificate of Exemption

HERITAGE FOUNDATION OF FRANKLIN & W
209 E MAIN ST
FRANKLIN TN 37064-2517

June 7, 2011
Account Type: S&U EXEMPT
Account No.: 100091394

Under the provisions of T.C.A. Section 67-6-322, the organization named above is granted authority from the Tennessee Department of Revenue to make purchases, without payment of the Sales or Use Tax, of tangible personal property or taxable services to be used or consumed by the organization itself or to be given away.

The organization must furnish the suppliers of goods and services with a COPY of this exemption certificate. The lower portion of the certificate must be properly completed. The organization MUST retain the original certificate for copy purposes. The supplier will maintain a file copy as evidence of exemption. Later purchases do not require the submission of additional copies. Invoices must contain the name of the organization and the number given above.

This authority does not extend to purchases made by representatives of the organization when the items purchased or services rendered are paid for with personal funds. It does not extend to items purchased to be resold.

THE ORGANIZATION MUST NOTIFY THE DEPARTMENT IMMEDIATELY IF IT CEASES TO EXIST, MOVES, OR IN ANY WAY CHANGES THE ORGANIZATION FROM ITS PRESENT FORM.

EFFECTIVE DATE July 1, 2011

Richard H. Roberts
COMMISSIONER OF REVENUE

TO BE COMPLETED BY THE ORGANIZATION (please print)

TO: SUPPLIER'S NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

I _____ as an authorized representative of the organization named above affirm that the purchases made under this authority will be used and consumed by the organization or will be given away. I further affirm that the organization will not use this authority to purchase items for resale.

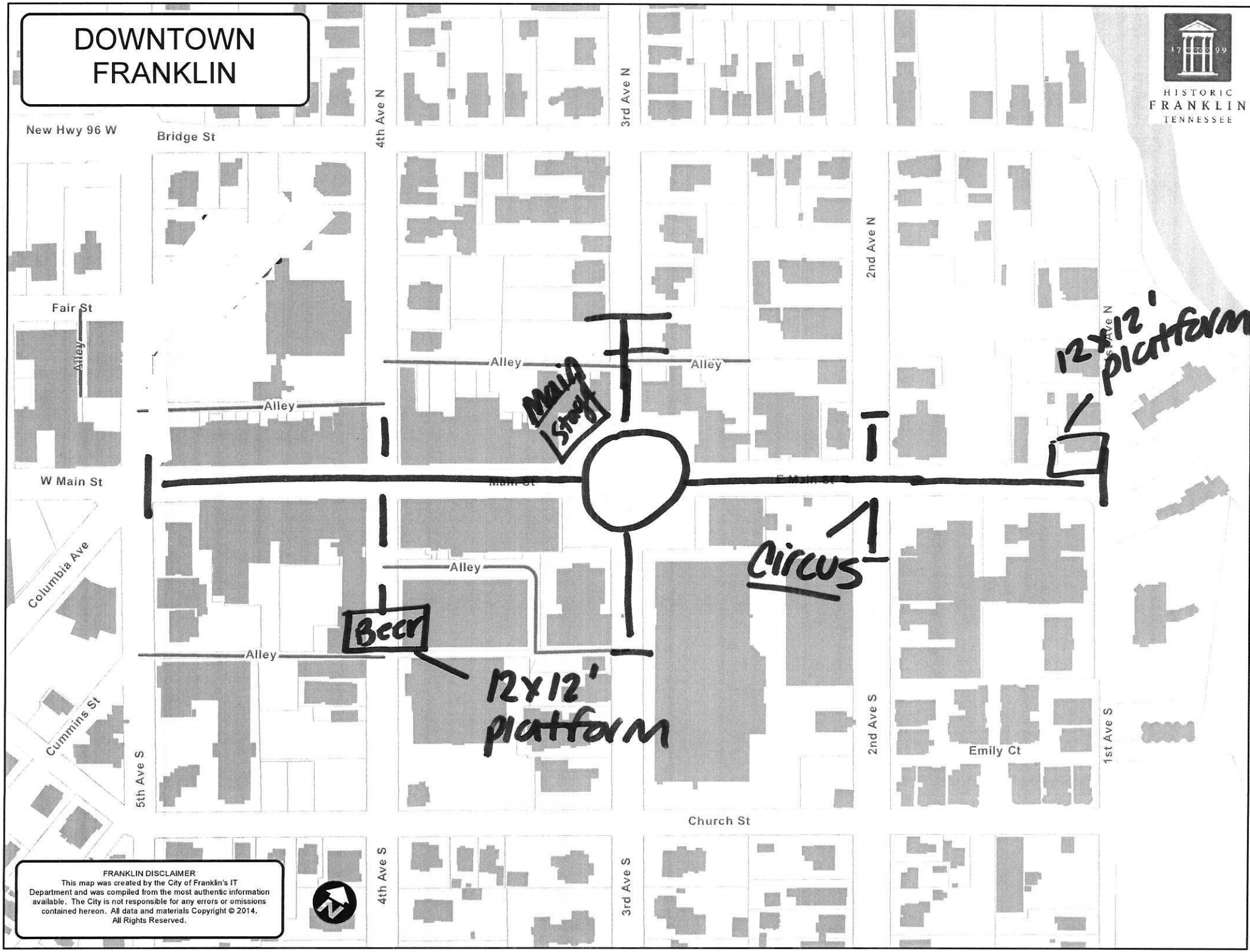
Under penalty of perjury, I affirm this to be a true and correct statement.

PRINT NAME OF ORGANIZATION : _____

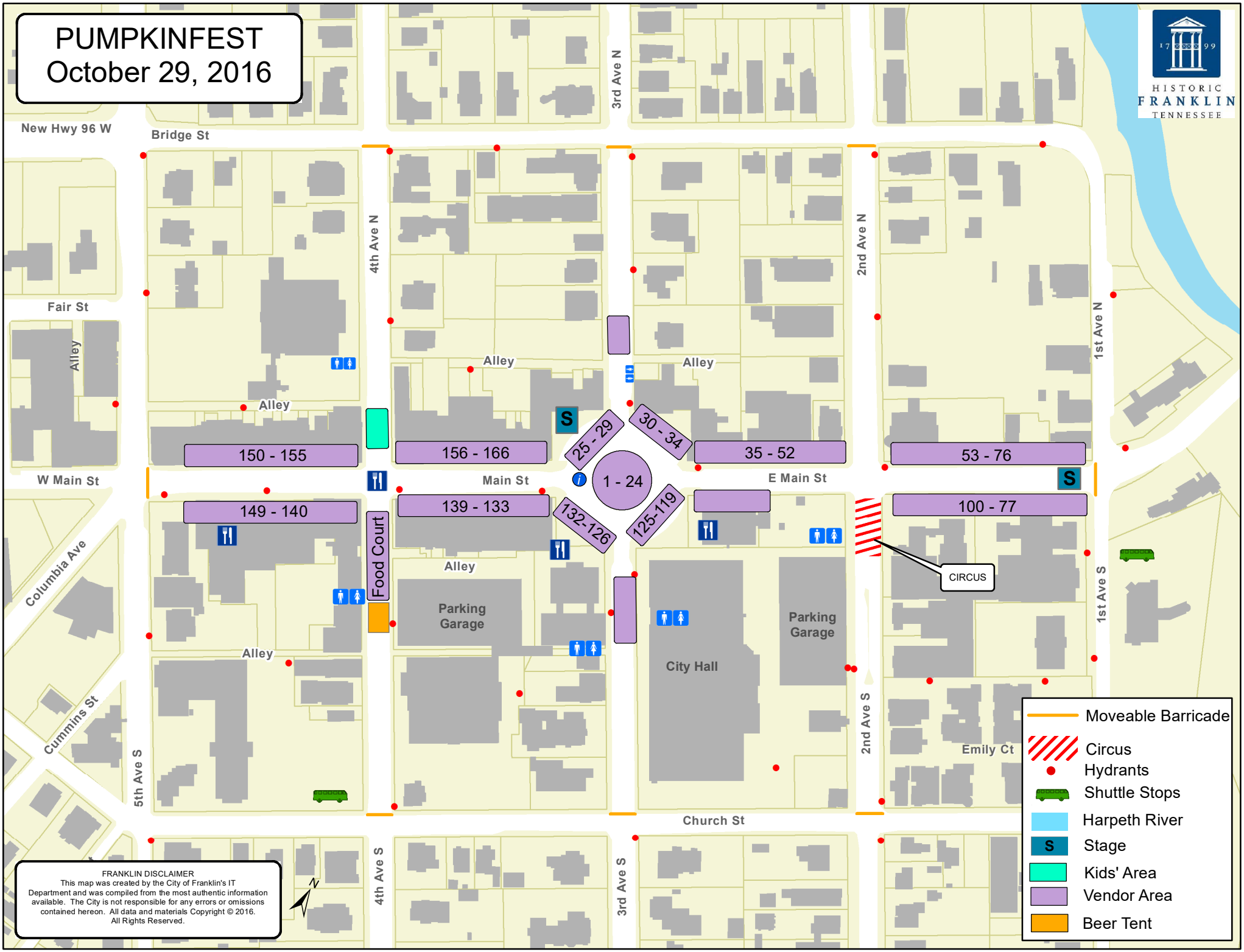
PRINT NAME OF PURCHASER: _____

SIGNATURE OF PURCHASER: _____

DOWNTOWN FRANKLIN



PUMPKINFEST
October 29, 2016



MC, e, d, r

HISTORIC
FRANKLIN
TENNESSEE

OFFICE USE ONLY:

Permit No: _____

CITY OF FRANKLIN
PARKS DEPARTMENT

PARKS EVENT PERMIT APPLICATION

- *Application for 199 participants or less is Due 30 Days Prior to Scheduled Event.*
- *Please read application carefully and fully complete each section.*
- *A non-refundable application fee of $100 is due at time of filing.*

Note: Filing this application does not guarantee that your request will be granted.

Please supply the following information. For additional space, use separate sheets of paper and attach to the application.

1) Location requested:

Aspen Grove Park_____ Liberty Park_____ The Park @ Harlinsdale____

Fieldstone Park_____ Pinkerton Park_____ Eastern Flank Battle Park ✓

Jim Warren Park_____ Winstead Hill Park____ Other: _____

2) Name/purpose of event: 2ND ANNUAL LIGHT THE WAY for TEAM ELLIOTT & RHIZOKILS

3) Date or dates of event: SUNDAY, OCT 2.

4) Time of Event: 4:00- 8:00 P.M.

5) Set-Up Date/Time: 10/2; 7:30 a.m. -? Tear-down Date/Time: 10/2; 8:30 p.m -?

6) Name of Applicant and Organization Requesting Permit:
BRANDY BLANTON - TEAM ELLIOTT

a) Address: 406 VIENNA CT

b) Phone:_____ c) Cell: (615) 300.5251 d) Fax: _____

e) E-mail address: brandy@southernexposuremagazine.com

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7) Person in charge on day of event: BRANDY BLANTON

Cell: 615) 300.5251 E-mail address: brandy@southernexposuremagazine.com

Additional Contact #2: JENNIFER RUSSELL

Cell: 615) 504. 2554 E-mail address: hibernation hill@att.net

Additional Contact #3: NICK RAINEY

Cell: 615) 294.0102 E-mail address: nrainey1@gmail.com

8) Description of event (use additional sheets if necessary):

SEE ATTACHMENT

REPEAT?

7) ENCLOSE A MAP of event site, detailing any temporary structures, location of vendors, vendor parking, volunteers parking, etc.

8) An estimated number of participants and an estimated number of attendees expected to attend during the course of the event: 400+

9) Please attach a list containing the names, addresses, and phone numbers of the Chairperson of the organization and all other persons involved in the management or control of organization and/or committee.

10) Is your organization based in Williamson County? Circle: Yes or No

(if no, please state where):

11) Is your organization authorized to do business in Tennessee? Circle Yes or No (If yes, please provide a copy.)

12) Is your organization a tax-exempt organization as described by the Internal Revenue Code Section 501(c)(3) or a not-for-profit organization? Circle Yes or No. If yes, please attach copy of IRS tax exemption letter providing proof of status.

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13) Will you charge an admission/participation fee (including vendors)? If yes, please specify how much per person/vendor. SUGGESTED DONATION: $20 per person
$50 per family

14) Will any charity, gratuity, or offers be solicited or accepted during the event? Circle: Yes or No.

15) Is this event a fundraiser? Circle Yes or No. If yes, what organization will be benefactor of event? What percentage of funds will they receive? TEAM ELLIOTT & RHICO KIDS INT'L

16) Will parking in the area of the event need to be restricted or prohibited? Circle Yes or No.

17) Will your event require overflow parking? BATTLE OF FRANKLIN TRUST/CARNTON IS LETTING US USE THEIR BACK LOT.
If yes, how many vehicles do you anticipate_____ (Event organizers are responsible for parking attendants).

18) Will any sound amplification equipment be used during the event? Circle yes or no. If no, please skip to Question #22.

19) For what purpose will sound amplification be used? (i.e. announcements, entertainment, etc.)
MUSIC & ANNOUNCEMENTS

20) What type of sound amplification will be provided (DJ, Band, etc.). Please list all that apply:
SPRINGTREE MEDIA IS TAKING CARE OF SOUND/LIGHTING

21) During what time period is sound amplification requested? 5-8 P.M.

22) If for entertainment, give details of entertainment being provided (i.e. number of musicians, type of music, amp wattage, etc.) N/A - SEE #20

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23) Will any stages, amusement attractions, or amusement rides be erected for the event? Circle: Yes or No.

- If yes, Applicant must give specific details as to the location and type of games/activities, i.e. Horseshoes, relay races, inflatable's, etc. along with the name of the company providing the stages and/or activities. Applicant must also include a copy of that company's insurance certificate indicating coverage , Including Workers Compensation Coverage and listing the City of Franklin as additionally insured.

- For stages constructed on site prior to the event – that date must be included on Certificate of Insurance provided to the City of Franklin. Stages MUST be removed from site at end of event.

- Rented inflatable's/interactive that are setup and manned by applicant must be included specifically in applicants certificate of insurance.

24) What, if any, vendors will be present at event? (i.e. medical related, shirts, arts, etc.) Please provide detailed listed. Use additional sheets if necessary.

- Will food, beverages, or merchandise be sold or given away? Circle Yes or No.

- If yes, clean-up is required. Please provide name of clean-up provider, phone number, and date and time clean-up is to occur. A refundable damage deposit (current fee schedule) in the form of a check only, is due at the time this agreement is signed by the Parks Director.

- Organizations event coordinator/representative and Parks Dept. representative will conduct a Pre-Event meeting the day prior to event date for Pre-Event Check List site review.

- At the end of the event a Post Event Check List shall be completed by the event coordinator/representative and a Parks Dept. representative to re-assess the site for trash, damage and securing, with caution tape and signage (provided by event group), any tents left for removal.

- Damage deposit will be refunded within ten (10) working days after the event has occurred only after a satisfactory Post Event Check List has been completed and signed off on, by both Parks Dept. and organization requesting event.

- If clean-up is not done properly the organization requesting the permit may be fined (See attachment A).

- *NOTE*: Events that include deep frying cooking oil operations are required to have a grease pit on-site and contract with a grease waste hauler to handle the grease waste and removal of the grease pit. The primary event sponsor is required to remove all cooking grease from

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TENNESSEE

the site immediately after the event. Illegal dumping of cooking grease will be prosecuted. *Please read Additional Requirements section of this application for more information.*

- Will your event include tents or other temporary structures, propane use, or open flames? Circle: Yes or No. If yes, other permits may be required from the City of Franklin Fire Department or Codes Department.
- Events using tents 10 x 20' or larger require permitting from Franklin Fire Dept., call 791-3270 to schedule inspection. Parks Dept. requires applicant to provide safety measures on all tents, especially those setup the day before the actual date of the event. Tents should be taken down the date the event has ended.

25) *Please read Additional Requirements section of this application for more information.*

26) Attach Good Neighbor Letter and Mailing List used. *Please read Additional Requirements section of this application for more information.*

PLEASE READ ATTACHMENTS BEFORE SIGNING APPLICATION.

- I/We agree to abide by all ordinances and regulations of the City of Franklin and all conditions placed upon the event by the City Administrator and the Board of Mayor and Aldermen.
- I/We do swear or affirm that all of the information given in this application is true and complete.
- **I/We do hereby agree to assume the defense of and indemnify and save harmless the City, its aldermen, boards, commissions, officers, employees and agents, from all suits, actions, damages or claims, including death, to which the City may be subjected of any kind or nature whatsoever resulting from, caused by, arising out of or as a consequence, known or unknown, of such event and the activities permitted in connection there with, and to submit a certificate of insurance prior to the event in an amount acceptable to the City Administrator. (*Please see current insurance requirements)***
- I/We understand that granting of Special Event Permit does not imply granting of other permit that is separately required.
- The application for an event permit shall be filed not less than 30 days nor more than 364 days prior to the scheduled date of such event. Failure to file in a timely manner may result in denial of a permit.

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- The City reserves the right to require one or more City of Franklin police officers or other emergency personnel are present at any and all events that occur within the city limits. Please budget for this request at a rate of $40.00 per hour at a minimum of three (2) hours.

- All applications will be reviewed on a case-by-case basis. Some activities may require additional risk management steps to minimize any foreseeable exposures to losses. As such, the city reserves the right to require additional steps to minimize any foreseeable exposures.

Brandy L. Blanton Date: 8-16-16

Event Coordinator/Client Signature

_____ Date: _____

Program Specialist, City of Franklin Parks

_____ Date: _____

Suzanne Carter, Recreation Foreman, City of Franklin Parks

_____ Date: _____

Paige Cruse, Parks and Recreation Superintendent, City of Franklin Parks

For official use only

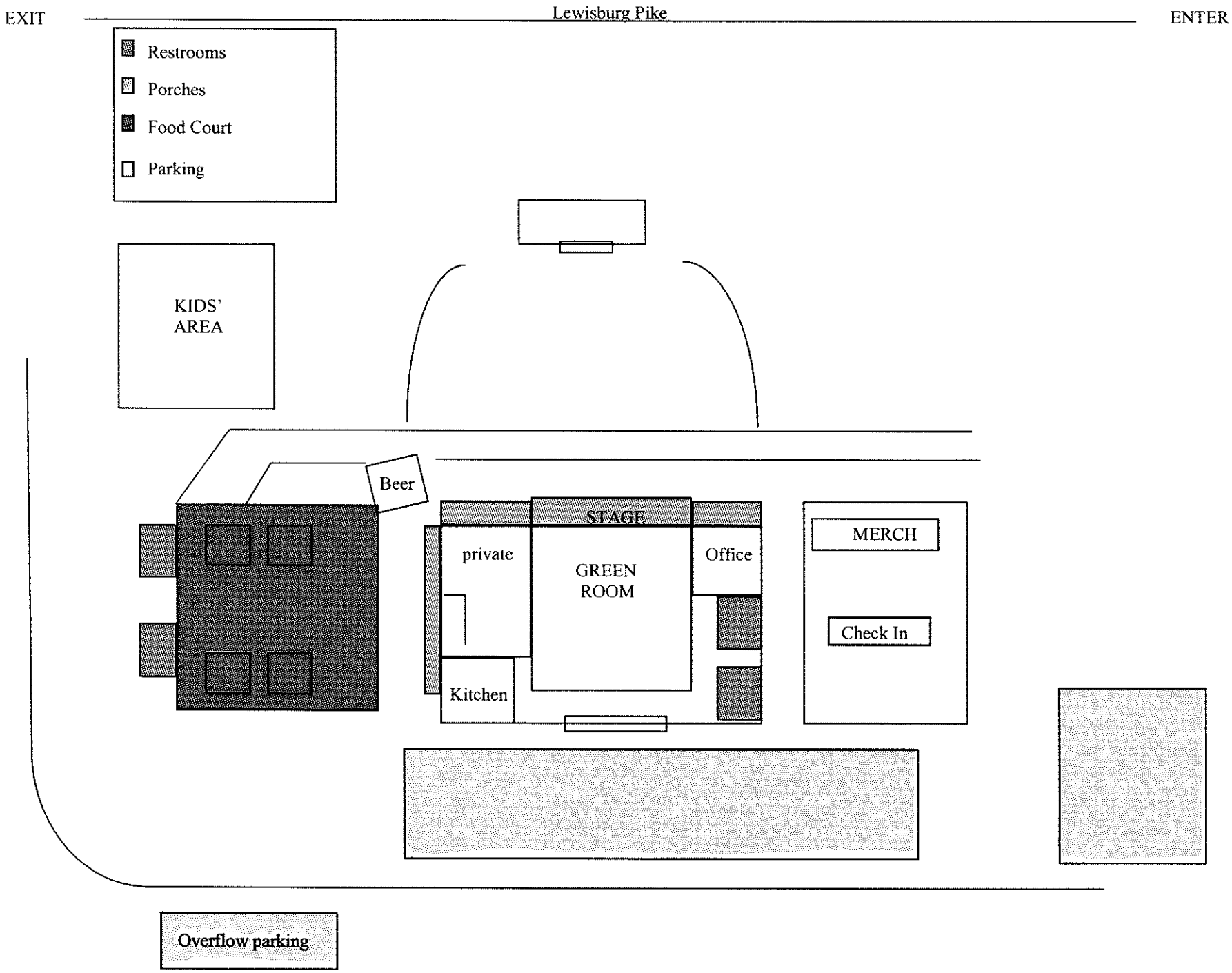
Scan and Send completed application with all

Return application to:

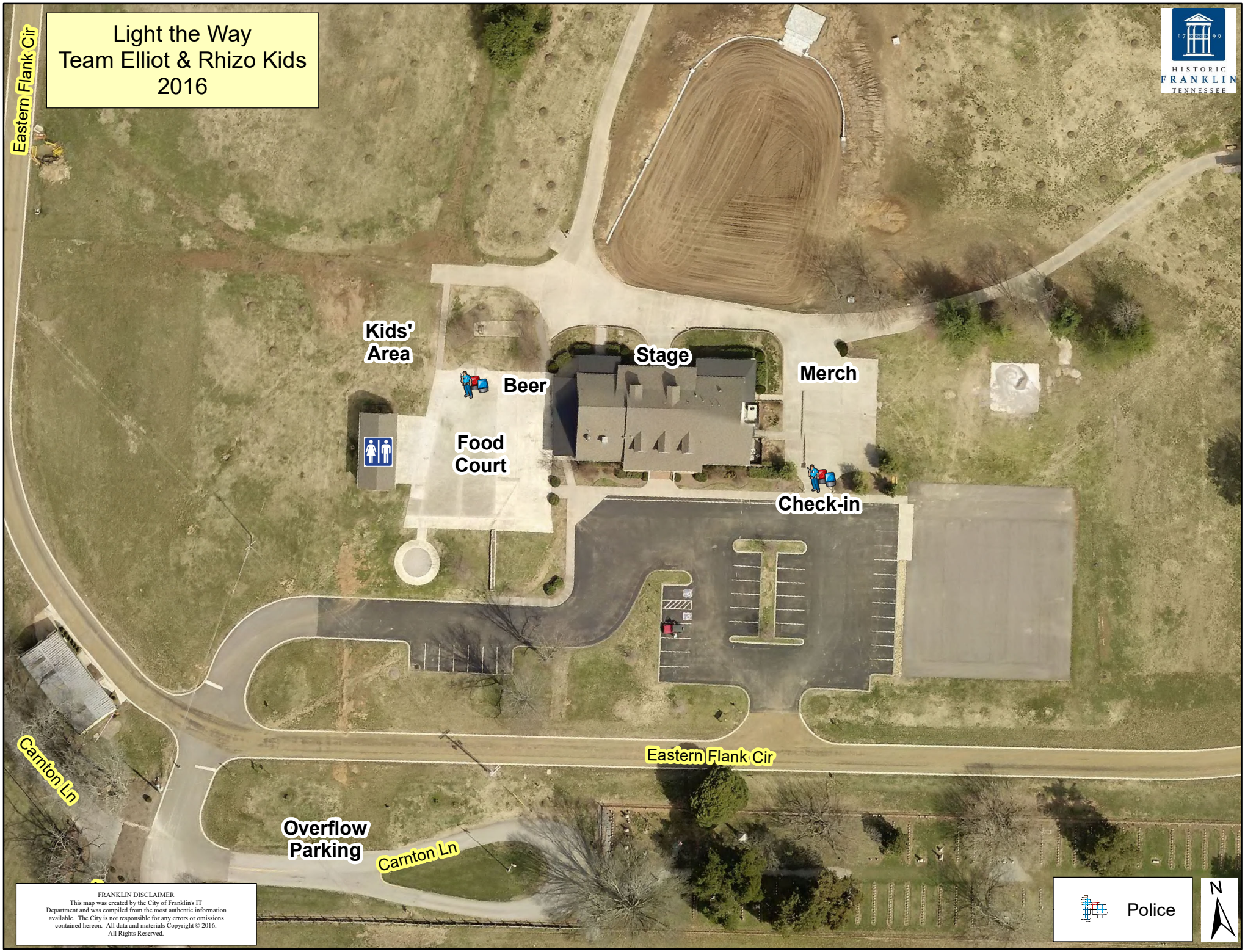
City of Franklin Parks Dept.,

P.O. Box 305 Franklin, TN 37065

615-794-2103(office) 615-791-3250 (FAX)


EXIT
Lewisburg Pike
ENTER
Restrooms
Porches
Food Court
Parking
KIDS' AREA
Beer
STAGE
private
GREEN ROOM
Office
MERCH
Check In
Kitchen
Overflow parking

Light the Way
Team Elliot & Rhizo Kids
2016



FRANKLIN DISCLAIMER
This map was created by the City of Franklin's IT Department and was compiled from the most authentic information available. The City is not responsible for any errors or omissions contained hereon. All data and materials Copyright © 2016. All Rights Reserved.

MAP OF EVENT SPACE:

Addendum to Event Permit for the 2nd Annual Light the Way

#8: Description of the Event
Light the Way is a family-friendly fundraiser consisting of live music played from the back porch of the clubhouse, deconstructed food trucks, a kids' area dubbed "Elliott's Dreamworld" complete with Touch-A-Truck, face painting, a balloon artist and more to benefit Team Elliott.

#9: Those involved:
Brandy Blanton – event management
Laura Hill – stage management
Suzette Lane – food
Diane Giddens/Pam Stephens – check in
Nick Rainey – set up/breakdown
Jennifer Russell – event management

#23: Amusement Attractions:
I am in the process of investigating the addition of a bouncy house and slide (no water included) to add to our kids' area. Once I have that confirmed (or denied) I will update the paperwork/insurance.

#24: Vendors:
Food: Catering & Events by Suzette
Food: Pueblo Real
T-shirts: created by Twine Graphics, sold by family/friends
Food: Ellie's Old-Fashioned Donuts

September ___, 2016

Dear Neighbor (s),

I am writing to let you know of an event being planned for Oct. 2, 2016 at the Eastern Flank Event Facility, the 2nd annual "Light the Way" for Team Elliott and Rhizo Kids.

My granddaughter, Elliott Grace Castro, was born on May 30, 2015 with a very rare terminal disease, Rhizomelic Chondrodysplaysia Punctata (RCDP). She is actually the 22nd living child with the disease in the United States. RCDP is a form of dwarfism and presents with what is called skeletal dysplasia and most children don't ever leave the hospital alive.

The prognosis of the disorder is the inability to walk or talk, the expectation of an IQ of 30 (mental retardation is 70) a propensity for cataracts (she has already had surgery on both eyes, wore glasses at first, but is now in contacts) and a life expectancy of childhood. We are thrilled to share that she celebrated her 1st birthday and is thriving – recently reaching a milestone of nine pounds!

Elliott receives therapy six times a week including occupational, physical, feeding therapy and more, and those services are provided right here in Franklin (many in our home) from High Hopes and WAVES. She also sees a myriad of medical professionals including a geneticist, cardiologist, ophthalmologist and more. She is a gift to our family and we realize that every day with her is precious.

While her parents do have private health insurance (with a hefty deductible) you can only imagine all the expenses incurred with a special needs child. The event we are hosting will not only benefit Team Elliott, but also Rhizo Kids, the non-profit which supports research for the disease. They are actually close to unveiling a clinical trial that replaces the gene that is missing in RCDP children.

"Light the Way" will feature live entertainment played from the back porch of the clubhouse; deconstructed food trucks, beer and wine available for purchase; a kids' area with a Touch-A-Truck from the Franklin Fire Department, face painting, "Sam the Balloon Man" and more.

We will begin at 4:30 p.m. on October, 2 and will be done before 8:00 that evening. We expect 500+ attendees and invite you to join us as well. We are not selling tickets to the event, but are asking for a (suggested) donation of $20 per person and $50 per family – food, beverages and merchandise is sold separately.

There is no street closure and we do plan to have the Franklin Police Department stationed at the exit of the Eastern Flank in order to keep traffic flowing smoothly. If you would like to contact someone in the City Administration office regarding the event, please contact, Monique McCullough at 615.550.6606 or by mail at 109 Third Ave. South, Franklin, TN 37064.

Since this is the second annual event, you might remember a similar letter from last year, or maybe even the event itself. If not, then I will take that as a good sign that we did not disturb you! Should you have questions for me, please see my contact information below.

Sincerely,

Brandy Blanton, Event organizer, "Light the Way"
Email: brandy@southernexposuremagazine.com
Cell: 615.300.5251

ORDINANCE 2016-29

TO BE ENTITLED: "AN ORDINANCE TO AMEND THE ZONING ORDINANCE OF THE CITY OF FRANKLIN, TENNESSEE, TO AMEND CHAPTER 3, SECTION 3.4.5, FFO - FLOODWAY FRINGE OVERLAY DISTRICT, IN ORDER TO ADD THE USE BOUTIQUE HOTELS, LOCATED IN CFCO-1, TO THE LIST OF PERMITTED USES AND AMEND SECTION 3.2.3, USE TABLE, TABLE 3-2, PERMITTED USES, IN ORDER TO REVISE THE ADDITIONAL REQUIREMENTS FOR BOUTIQUE HOTELS."

WHEREAS, the City wishes to allow for the redevelopment of properties that are located within the floodway fringe in the Central Franklin Character Area Overlay District, Special Area 1 (CFCO-1), for use as a Boutique Hotel, and

WHEREAS, a portion of this area had previously been developed and serves as an important gateway into Historic Downtown Franklin; and

WHEREAS, this text amendment modifies the FFO – Floodway Fringe Overlay District to permit Boutique Hotels to be developed in CFCO-1 and updates the Use Table to clarify the additional requirements for Boutique Hotel uses; and

WHEREAS, new development within the floodway fringe must also meet floodplain protection standards and stormwater management requirements; 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 FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That Chapter 3, Section 3.4, Subsection 3.4.5 (2) (a) of the Franklin Zoning Ordinance is hereby amended to add the following text noted in **bold**, and is approved to read as follows:

3.4.5 FFO—Floodway Fringe Overlay District

***

(2) Permitted Uses
All uses shall also comply with the requirements of the Stormwater Management Ordinance.

(a) The following shall be permitted new uses/encroachments:

***

(vii) Boutique Hotels, located in CFCO-1

SECTION II. That Chapter 3, Section 3.2, Subsection 3.2.3, Table 3-2, Permitted Uses, 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,** and is approved to read as follows:

TABLE 3-2: PERMITTED USES																				
Use Types "P" = Permitted	**Base Zoning Districts**																			**Additional Requirements**
	AG	**ER**	**R-**	**R-**	**R-**	**R-**	**SD**	**SD**	**R**	**R**	**R**	**OR**	**G**	**NC**	**CC**	**GC**	**LI**	**HI**	**CI**	
COMMERCIAL USES																				
Boutique Hotels								P							P					Sec. 3.2.7 (1) and ~~(6)~~ **(7)**

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 S. Stuckey
City Administrator

CITY OF FRANKLIN, TENNESSEE

BY: _____
Dr. Ken Moore
Mayor

Approved as to Form:

_____
Shauna R. Billingsley, City Attorney

PLANNING COMMISSION RECOMMENDED: _____

PASSED FIRST READING: _____

PUBLIC HEARING HELD: _____

PASSED SECOND READING: _____

PASSED THIRD READING: _____

Proposed Text Amendment – FFO Permitted Uses

3.4.5 FFO—Floodway Fringe Overlay District
***

(2) Permitted Uses

All uses shall also comply with the requirements of the Stormwater Management Ordinance.

(a) The following shall be permitted new uses/encroachments:

- (i) Passive parks, golf courses, and open space;
- (ii) Active recreation features provided that all fencing, walls, or permanent buildings be located outside the ten-year flood zone;
- (iii) Temporary uses, as regulated by Section 4.2, that do not include permanent structures;
- (iv) Public and private infrastructure, as defined in Chapter 8 of the ordinance and in accordance with the Stormwater Management Ordinance;
- (v) Floodplain alteration conducted in accordance with the city's Stormwater Management Ordinance; and
- (vi) Parking lots, completely constructed of pervious pavers, pervious asphalt, or pervious concrete
- **(vii) Boutique Hotels, located in CFCO-1**

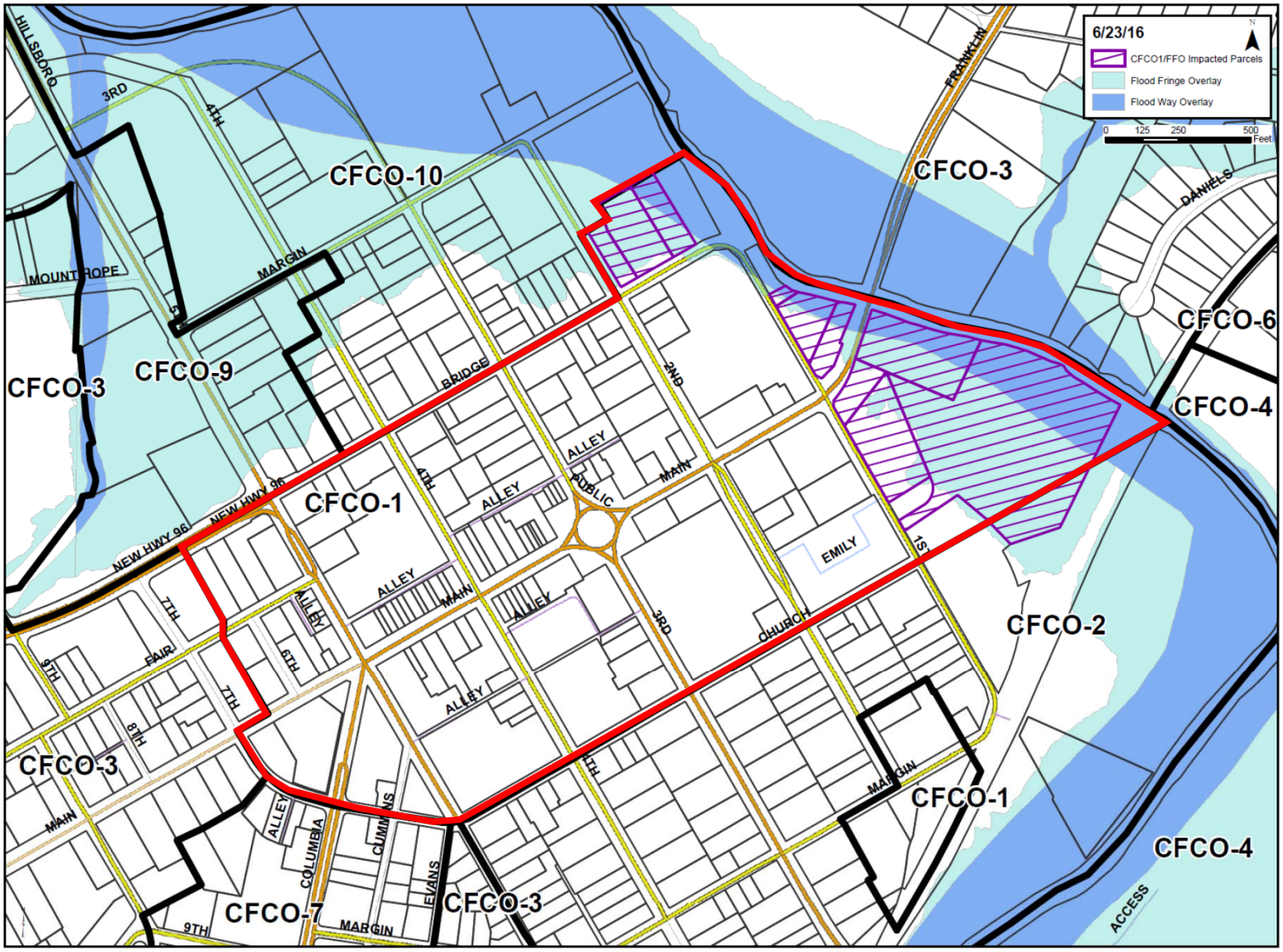
Proposed Text Amendment – FFO Permitted Uses

- Revise Table 3-2 – Permitted Uses
- Correct Additional Requirements to change reference from (6) Hotels to (7) Boutique Hotels

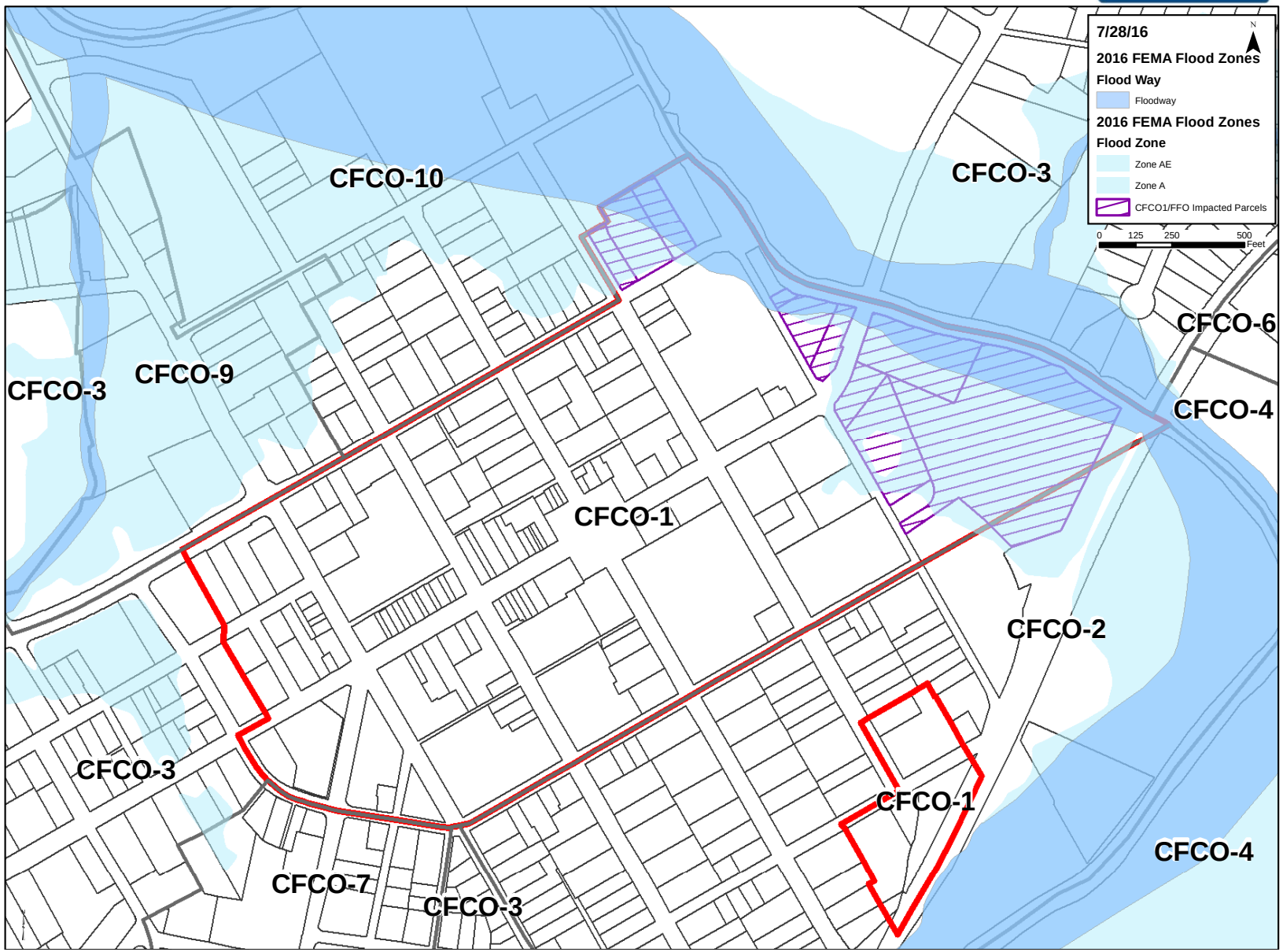
TABLE 3-2: PERMITTED USES

Use Types "P" = Permitted	Base Zoning Districts																			Additional Requirements
	AG	ER	R-	R-	R-	R-	SD	SD	R	R	R	OR	G	NC	CC	GC	LI	HI	CI	
COMMERCIAL USES																				
Boutique Hotels								P							P					Sec. 3.2.7 (1) and ~~(6)~~ (7)

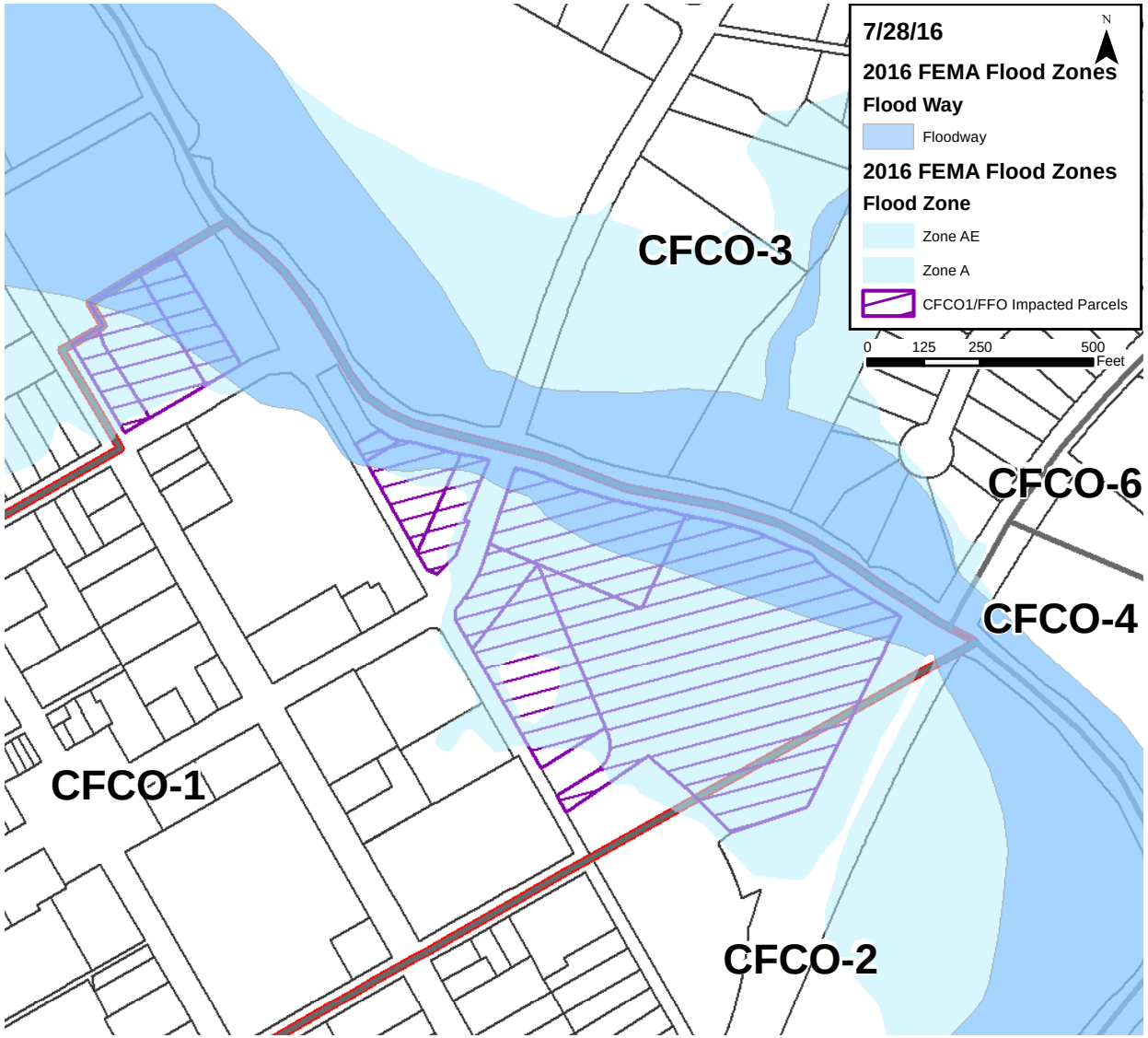
Existing FFO and FWO



New FFO and FWO – 2016 FEMA Maps

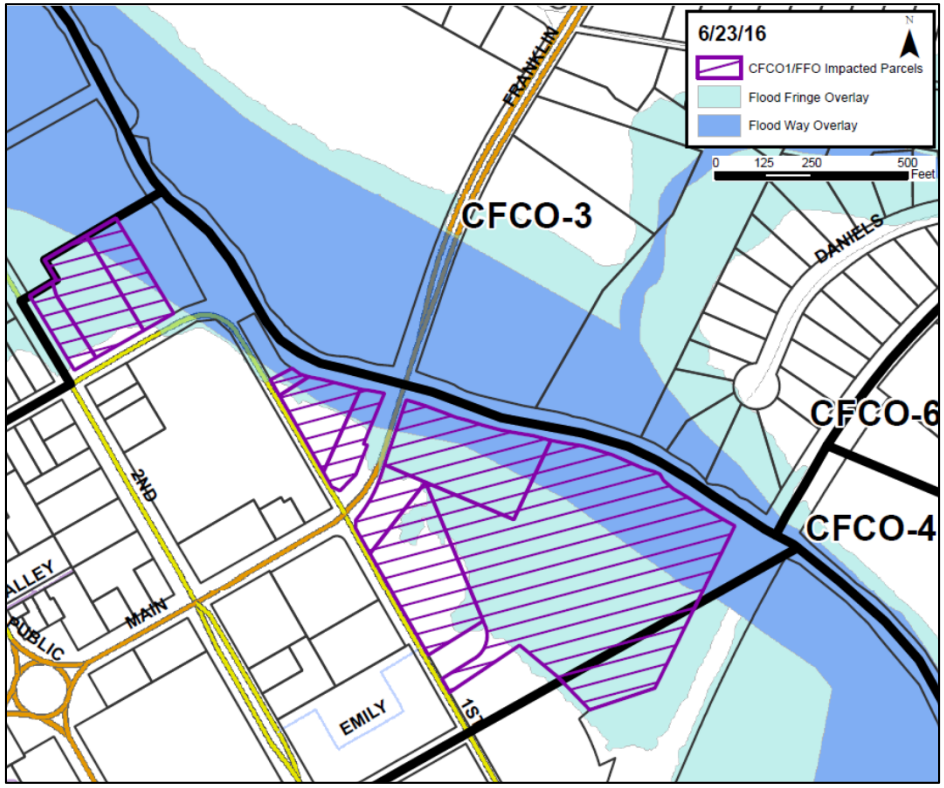


New FFO and FWO – 2016 FEMA Maps

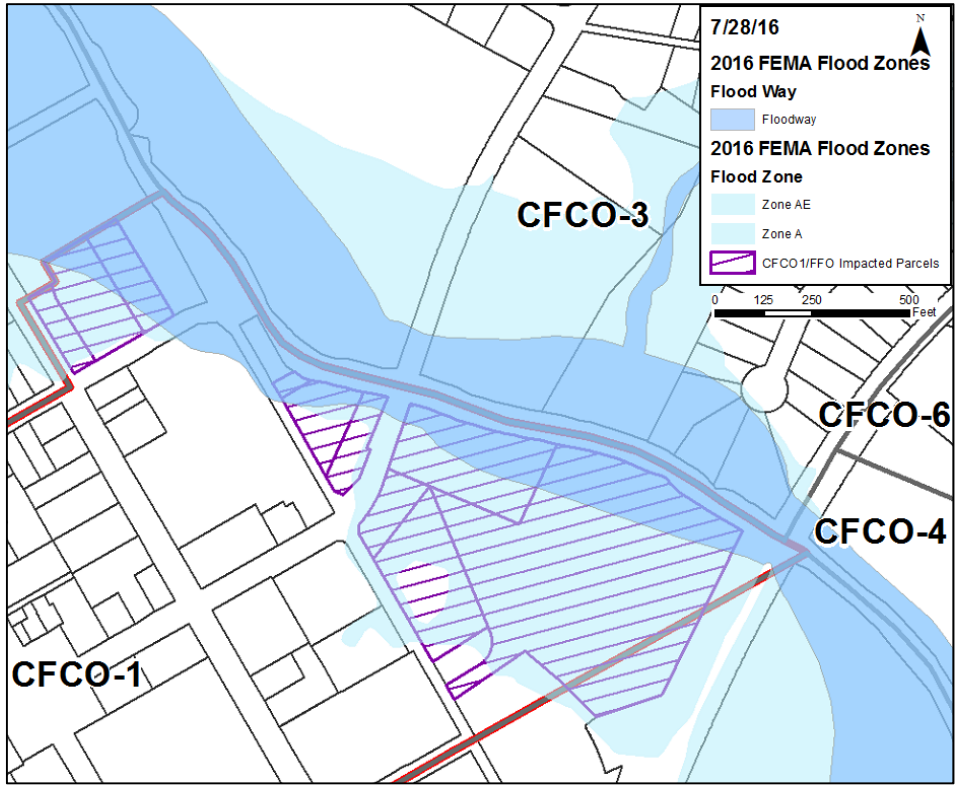


Existing and Proposed FFO and FWO

Existing FFO and FWO



Proposed FFO and FWO



ORDINANCE 2016-32

TO BE ENTITLED, "AN ORDINANCE TO REZONE 5.3 ACRES FROM HEAVY INDUSTRIAL DISTRICT (HI) AND DETACHED RESIDENTIAL 3 DISTRICT (R-3) TO SPECIFIC DEVELOPMENT RESIDENTIAL (SD-R 7.55) DISTRICT FOR THE PROPERTY LOCATED SOUTH OF AVONDALE DRIVE AND EAST OF COLUMBIA AVENUE, 302 AVONDALE 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 (SD-R 7.55) district provides zoning for land uses compatible with both the Franklin Land Use Plan and surrounding development; and

WHEREAS, the Board of Mayor and Aldermen (BOMA) of the City of Franklin, Tennessee, adopted Resolution 2016-45 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 ALDERMEN 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 Heavy Industrial District and Detached Residential 3 District to Specific Development-Residential (SD-R 7.55) District:

PREMISES CONSIDERED

Map-Parcel	Acres
078N-D01200	3.8
Potion of 078N-D01100	1.5
Total	5.3

A LOT OR PARCEL OF LAND LOCATED IN THE NINTH CIVIL DISTRICT OF WILLIAMSON COUNTY, TENNESSEE AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A 1/2-INCH IRON PIN MARKING THE SOUTHEAST CORNER OF LOT 9, JAMES SUBDIVISION AS RECORDED IN PLAT BOOK 2 PAGE 10 IN THE OFFICE OF THE REGISTER OF DEEDS, WILLIAMSON COUNTY; LOT 9 BEING CURRENTLY OWNED BY TED & DOROTHY BEAKLEY; THENCE ALONG THE BEAKLEY'S EAST PROPERTY LINE, NORTH 7 DEGREES 52 MINUTES 31 SECONDS EAST A DISTANCE OF 124.78 FEET TO A 1/2-INCH OPEN TOP PIPE (BENT) LOCATED ON THE SOUTH RIGHT-OF-WAY MARGIN OF AVONDALE DRIVE (50 FOOT PUBLIC RIGHT-OF-WAY); THENCE ALONG THE SOUTH MARGIN OF SAID AVONDALE DRIVE, SOUTH 82 DEGREES 1 MINUTE 32 SECONDS EAST A DISTANCE OF 80.00 FEET TO A 1/2-INCH CAPPED IRON PIN (STAMPED PLS2939) MARKING THE NORTHWEST CORNER OF LOT 11, JAMES SUBDIVISION THAT IS CURRENTLY OWNED BY

HILLARY CHAMBERS; THENCE ALONG THE WEST PROPERTY LINE OF THE CHAMBERS PROPERTY; SOUTH 8 DEGREES 5 MINUTES 22 SECONDS WEST A DISTANCE OF 126.77 FEET TO A 1/2-INCH OPEN TOP PIPE; THENCE ALONG THE SOUTH PROPERTY LINE OF THE CHAMBERS PROPERTY SOUTH 80 DEGREES 31 MINUTES 15 SECONDS EAST A DISTANCE OF 645.13 FEET TO A 5/8-INCH IRON PIN FOUND ON THE NORTH PROPERTY LINE OF AN ABANDONED RAILROAD SPUR; THENCE ALONG SAID ABANDONED SPUR AROUND A CURVE TO THE LEFT HAVING A RADIUS OF 825.00 FEET AND A CHORD BEARING AND DISTANCE OF NORTH 43 DEGREES 24 MINUTES 35 SECONDS EAST 92.11 FEET TO A 1/2-INCH OPEN TOP PIPE; THENCE AROUND A CURVE TO THE LEFT HAVING A RADIUS OF 825.00 FEET AND A CHORD BEARING AND DISTANCE OF NORTH 35 DEGREES 34 MINUTES 17 SECONDS EAST 159.38 FEET TO A 3/4-INCH OPEN TOP PIPE; THENCE AROUND A CURVE TO THE LEFT HAVING A RADIUS OF 825 FEET AND CHORD BEARING AND DISTANCE OF NORTH 27 DEGREES 57 MINUTES 13 SECONDS EAST 79.57 FEET TO A 3/4-INCH OPEN TOP PIPE; THENCE AROUND A CURVE TO THE LEFT HAVING A RADIUS OF 825.00 FEET AND A CHORD BEARING AND DISTANCE OF NORTH 22 DEGREES 2 MINUTES 2 SECONDS EAST 77.94 FEET TO A 1/2-INCH OPEN TOP PIPE; THENCE AROUND A CURVE TO THE LEFT HAVING A RADIUS OF 825.00 FEET AND A CHORD BEARING AND DISTANCE OF NORTH 12 DEGREES 57 MINUTES 10 SECONDS EAST 188.67 FEET TO A 1/2-INCH CAPPED IRON PIN (STAMPED PLS2939) LOCATED ON THE WEST RIGHT-OF-WAY MARGIN OF THE CSX TRANSPORTATION RAILROAD (50 FOOT RIGHT-OF-WAY) THENCE ALONG SAID MARGIN, SOUTH 4 DEGREES 6 MINUTES 22 SECONDS WEST A DISTANCE OF 258.20 FEET TO A 5/8-INCH IRON PIN; THENCE LEAVING SAID MARGIN AROUND A CURVE TO THE RIGHT HAVING A RADIUS OF 875.00 FEET AND A CHORD BEARING AND DISTANCE OF SOUTH 63 DEGREES 55 MINUTES 42 SECONDS WEST 1137.22 FEET TO A 1/2-INCH CAPPED IRON PIN (STAMPED PLS2939); THENCE NORTH 16 DEGREES 1 MINUTE 51 SECONDS EAST A DISTANCE OF 50.01 FEET TO A 1/2-INCH OPEN TOP PIPE; THENCE ALONG THE GERALD & GENETTE ROBESON'S EAST PROPERTY LINE NORTH 16 DEGREES 1 MINUTE 51 SECONDS EAST A DISTANCE OF 311.08 FEET TO A 5/8-INCH IRON PIN; THENCE ALONG THE ROBESON'S NORTH PROPERTY LINE, NORTH 80 DEGREES 31 MINUTES 24 SECONDS WEST A DISTANCE OF 39.92 FEET TO THE POINT OF BEGINNING AND CONTAINING 5.31 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

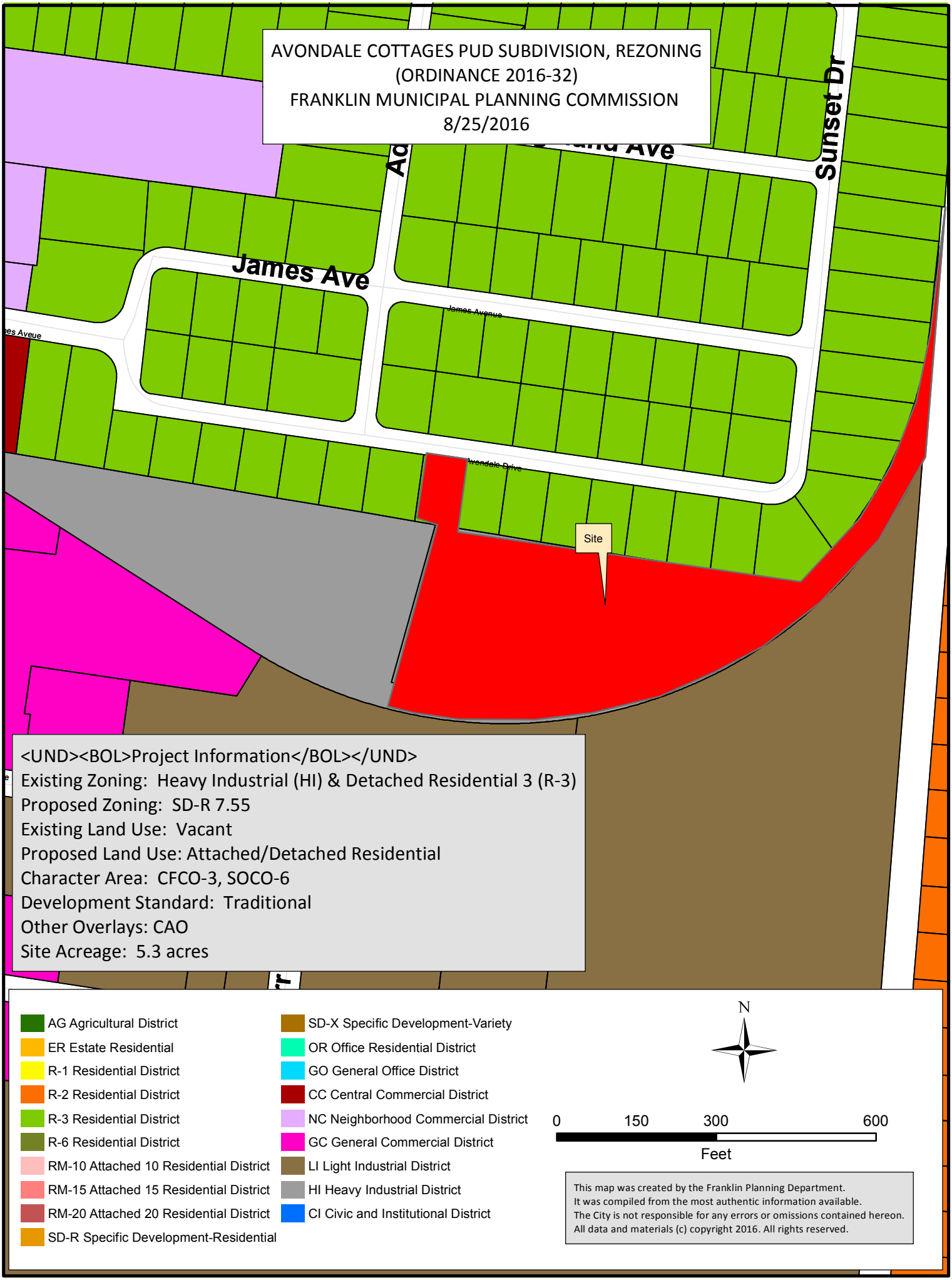
PLANNING COMMISSION RECOMMENDED: _____

PASSED FIRST READING: _____

PUBLIC HEARING HELD: _____

PASSED SECOND READING: _____

PASSED THIRD READING: _____


AVONDALE COTTAGES PUD SUBDIVISION, REZONING
(ORDINANCE 2016-32)
FRANKLIN MUNICIPAL PLANNING COMMISSION
8/25/2016
Sunset Dr
James Ave
James Avenue
Avondale Drive
Site
<UND><BOL>Project Information</BOL></UND>
Existing Zoning: Heavy Industrial (HI) & Detached Residential 3 (R-3)
Proposed Zoning: SD-R 7.55
Existing Land Use: Vacant
Proposed Land Use: Attached/Detached Residential
Character Area: CFCO-3, SOCO-6
Development Standard: Traditional
Other Overlays: CAO
Site Acreage: 5.3 acres
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 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
0 150 300 600
Feet
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It was compiled from the most authentic information available.
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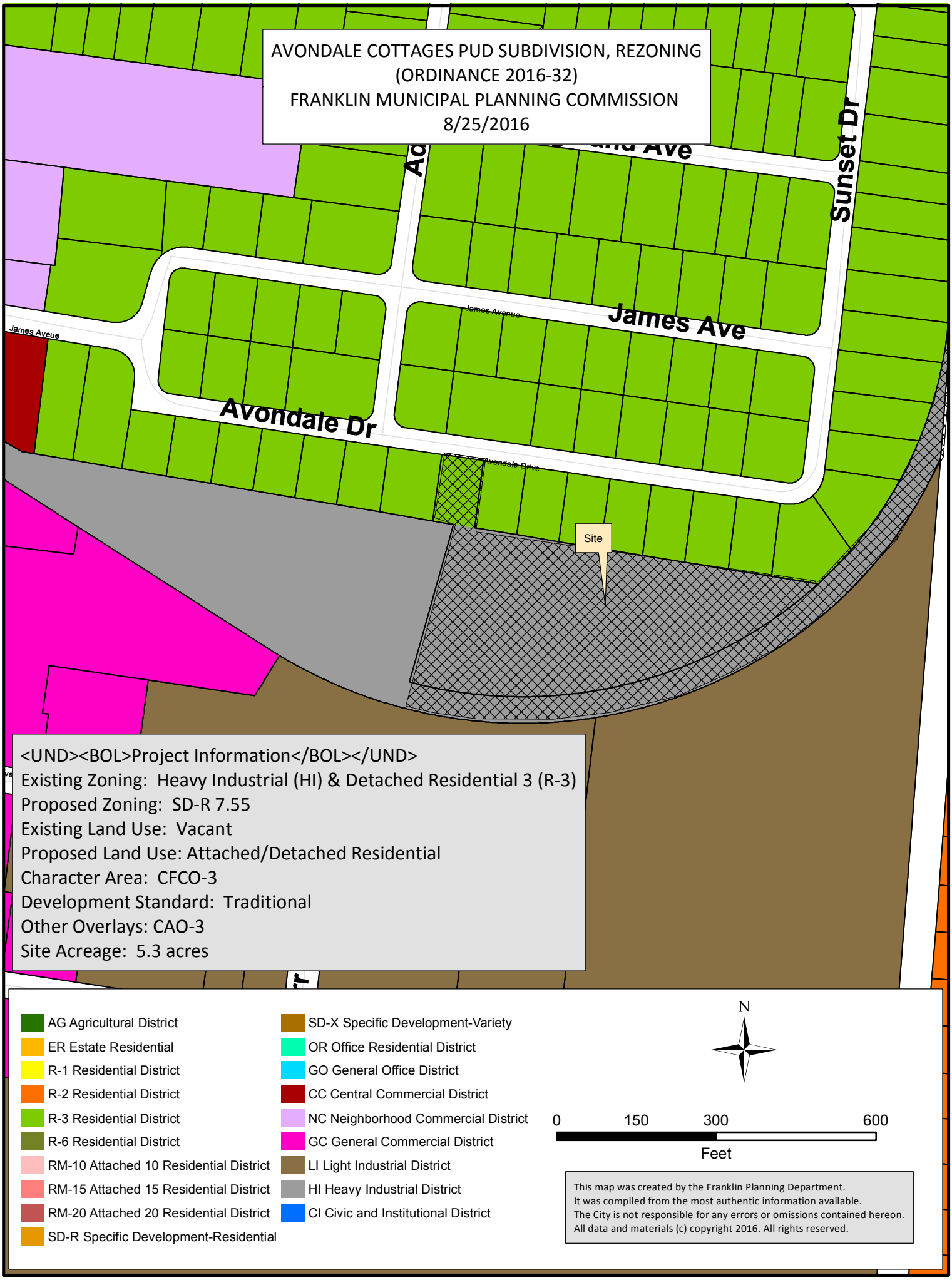
AVONDALE COTTAGES PUD SUBDIVISION, REZONING
(ORDINANCE 2016-32)
FRANKLIN MUNICIPAL PLANNING COMMISSION
8/25/2016
Sunset Dr
James Ave
James Avenue
James Aveue
Avondale Dr
Avondale Drive
Site
<UND><BOL>Project Information</BOL></UND>
Existing Zoning: Heavy Industrial (HI) & Detached Residential 3 (R-3)
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0
150
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600
Feet
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14 TO 19% SLOPES

20%+ SLOPES

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

AVONDALE COTTAGES

PUD SUBDIVISION - DEVELOPMENT PLAN

AVONDALE DRIVE
FRANKLIN, TN

REVISIONS	
No.	DATE

08/04/16 15035

C1.0

EXISTING CONDITIONS PLAN

REZONING

AVONDALE COTTAGES
PUD SUBDIVISION, DEVELOPMENT PLAN

Franklin, Williamson County, Tennessee

CITY OF FRANKLIN PROJECT NO. 6196

AUGUST 4, 2016

SITE DATA

PROJECT NAME	AVONDALE COTTAGES
PROJECT NUMBER:	6196
SUBDIVISION:	N/A
ADDRESS:	302 AVONDALE DRIVE, FRANKLIN
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
OWNER INFO:	GERALD W. ROBESON & GENETTE C. ROBESON 2415 N. BERRY'S CHAPEL RD. FRANKLIN, TN 37069 (615)790-2222 WORK geraldrobeson@aol.com WILLIAM L. MAYO PO BOX 65 CHAPEL HILL, TN 37034 jumpsbyfuzzy@att.net
CIVIL DISTRICT:	9TH
LEGAL DESCRIPTION:	BEING ALL OF PARCEL 12.00, MAP 078N D AND A PORTION OF PARCEL 11.00, MAP 178N D.
ACREAGE OF SITE:	+/- 5.3 ACRES
SQUARE FOOTAGE OF SITE:	231,277.24 SF
EXISTING ZONING	HEAVY INDUSTRIAL DISTRICT (HI)
PROPOSED ZONING	SD-R 7.55
PROPOSED RESIDENTIAL UNITS:	40 TOTAL DWELLINGS 1 (S) SINGLE FAMILY DWELLING 24 (D) DUPLEX UNITS 15 (T) TOWN HOME UNITS
RESIDENTIAL DENSITY:	7.55 DU/A
CHARACTER AREA:	CFCO - 3
OVERLAY:	A PORTION OF THE PROPERTY IS LOCATED WITHIN THE COLUMBIA AVE OVERLAY DISTRICT
DEVELOPMENT STANDARD (PROPOSED):	TRADITIONAL
DRAINAGE BASIN:	HARPETH RIVER
RAILROAD INFRASTRACTURE/ROW	ABANDONED BATTLEFIELD BRANCH OF THE CSX RAILROAD RUNS ALONG THE SOUTHERNEDGE OF THE SUBJECT PROPERTY
PROPOSED SETBACKS:	5' FRONT 5' SIDE 5' REAR
MINIMUM LANDSCAPE SURFACE RATIO:	.20
MINIMUM PARKING REQUIREMENT:	SINGLE FAMILY HOMES = 2 SPACES PER UNIT
PARKING PROVIDED:	GARAGES: 57 DRIVEWAY: 38 ON STREET PARALLEL: 10 SURFACE PARKING: 60 TOTAL: 121 (3.0 PER UNIT)
PARKLAND DEDICATION:	FEES IN LIEU OF PARKLAND DEDICATION SHALL BE PAID PRIOR TO THE RECORDING OF THE FIRST FINAL PLAT FOR THE SUBDIVISION
OPEN SPACE SET-ASIDE: REQUIRED:	10,056.4 SF (5%) FORMAL: 10,056.4 SF (100%) INFORMAL: N/A (0%)
PROVIDED:	11,980 SF (5%) FORMAL: 11,980 SF (5%) INFORMAL: N/A (0%)

SITE AMENITIES - FORMAL OPEN SPACE AMENITIES SHALL INCLUDE: WALKS, SEATING AREAS, BENCHES, LANDSCAPING, AND DECORATIVE STREET LIGHTING. FINAL DESIGNS TO BE DEVELOPED WITH THE SITE PLANS.

EXISTING STRUCTURES:	+/- 20,000SF MANUFACTURING FACILITY
MINERAL RIGHTS:	N/A
GAS EASEMENT:	N/A
TVA EASEMENT:	N/A
MTEMC EASEMENT:	40' ELECTRIC EASEMENT ALONG THE NORTHERN PROPERTY LINE.

TREE CANOPY/PRESERVATION PLAN:

EXISTING TREE CANOPY COVERAGE:	48% OF SITE (111,373 SF)
TREE CANOPY RETENTION (MIN):	21.6% (.48 [EXISTING COVER] X .45 [REQ. RETENTION COVER])
MINIMUM TREE PROTECTION ZONE:	49,995 SF
TREE PROTECTION PROVIDED:	45,426 SF

LIGHTING:

APPROXIMATE LOCATION OF PROPOSED STREET LIGHT. PROPOSED LIGHTING WILL CONSIST OF DECORATIVE STREET POLE LIGHTS AND SHALL BE DESIGNED IN COMPLIANCE WITH CITY OF FRANKLIN AND MIDDLE TENNESSEE ELECTRIC STANDARDS.

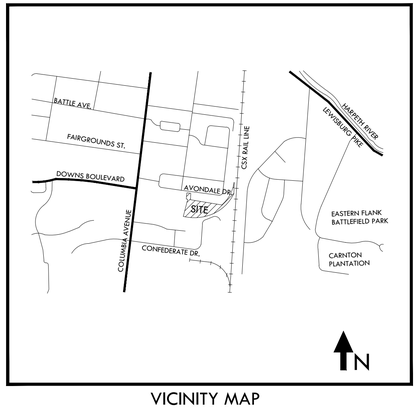
CONNECTIVITY INDEX:

LINKS 5
NODES 3

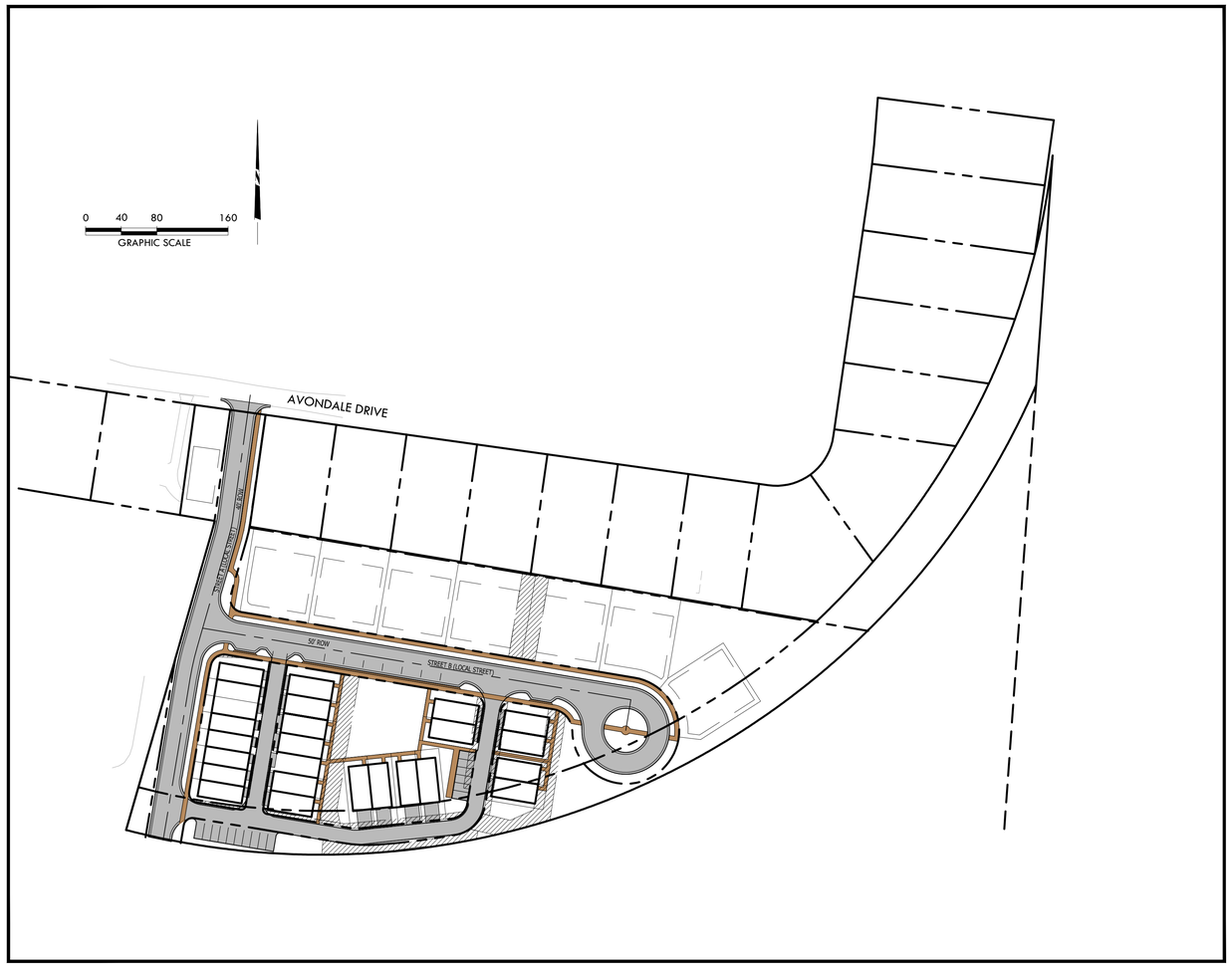
5/3 = 1.67
(1.65 REQUIRED)

PROJECT PHASING:

PROJECT WILL BE DEVELOPED IN ONE PHASE.



VICINITY MAP
NO SCALE



INDEX OF SHEETS

SHEET NO.	SHEET TITLE
C0.0	COVER SHEET
C1.0	EXISTING CONDITIONS
C1.1	OVERALL EXISTING CONDITIONS

STATEMENT OF IMPACT - POLICE, FIRE, SOLID WASTE, PARKS:
The proposed project will add 40 residential units. The property is currently developed as an industrial use 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 1.1 mile driving distance from the Police Station; 6 miles driving distance from the nearest fire station on Hwy 96 West.

The project will be served by individual residential dumpsters. Trash pickup will be done by public services

No new parkland is being dedicated as part of this project. However, this project will contribute to parkland funds. With 40 residential units, 1.03 acres of parkland dedication will be required.

STATEMENT OF IMPACT - STORMWATER:

The proposed development contains a wet weather conveyance that has a formal hydrologic determination from TDEC that will be re-routed through the project site. A combination of stormwater treatment practices will be utilized within this development including pervious pavement and bio-retention.

STATEMENT OF IMPACT - TRANSPORTATION:
The proposed project will add 40 residential units with access along Avondale Drive. The primary road corridor serving the project is Columbia Avenue. A future road connection to Carr Avenue has been accounted for with this project.

STATEMENT OF IMPACTS - WATER AND SEWER:
The proposed project is the construction of 1 single family dwelling, 24 duplex units, and 15 townhome units. The project will result in a projected flow of 14,000 GPD. The site will be served by water off of the existing 6" main in the Avondale Dr ROW with a possible connection to Carr Avenue. Existing sanitary sewer will be re-routed through the project site and extended to serve the new 40 units.

PREPARED FOR:
BRISTOL DEVELOPMENT GROUP
381 MALLORY STATION RD, SUITE 204
FRANKLIN, TENNESSEE
(615)-369-9009

LANDSCAPE ARCHITECT: JASON GODDARD
DESIGN STUDIO
908 HIGH POINT RIDGE ROAD
FRANKLIN, TENNESSEE
(615)-218-8118

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

AVONDALE COTTAGES
PUD SUBDIVISION - DEVELOPMENT PLAN
AVONDALE DRIVE
FRANKLIN, TN

REVISIONS	
No.	DATE

08/04/16 15035

C0.0

COVER SHEET

ID	PRCLID	DEED / PLAT	LAND USE	OWNER	ZONING
1	078N A 01200 00009078N	DB-1996 DP-867	RESIDENTIAL	EL-URFALI RICHARD I	R-3
2	078N A 01300 00009078N	DB-6579 DP-816 PB-2 PP-10	RESIDENTIAL	SUMIDA MICHAEL S	R-3
3	078N A 01400 00009078N	DB-3534 DP-458 PB-2 PP-10	RESIDENTIAL	HOOD MARY F	R-3
4	078N B 02400 00009078N	DB-4431 DP-394 PB-2 PP-22	RESIDENTIAL	MAUK KAREN ANN	R-3
5	078N B 02500 00009078N	DB-6223 DP-343 PB-2 PP-22	RESIDENTIAL	IMMERFALL MARK D	R-3
6	078N B 02600 00009078N	DB-6260 DP-880 PB-1 PP-78	RESIDENTIAL	WALLACE ERIK ROBERT	R-3
7	078N B 02700 00009078N	DB-1407 DP-577 PB-1 PP-78	RESIDENTIAL	JACKSON LYNN E	R-3
8	078N B 02800 00009078N	DB-5529 DP-155 PB-1 PP-78	RESIDENTIAL	LUFFMAN VIKKI	R-3
9	078N B 03300 00009078N	DB-2940 DP-448 PB-2 PP-10	RESIDENTIAL	BARNES DEBRA A	R-3
10	078N B 03400 00009078N	DB-5733 DP-63 PB-2 PP-10	RESIDENTIAL	MATHIS MICHELLE	R-3
11	078N B 03500 00009078N	DB-1209 DP-00242 PB-2 PP-10	RESIDENTIAL	BYRD THELMA JEAN LANGLEY	R-3
12	078N B 03600 00009078N	DB-5309 DP-173 PB-2 PP-10	RESIDENTIAL	WESSON MACY	R-3
13	078N B 03700 00009078N	DB-4983 DP-183 PB-2 PP-10	RESIDENTIAL	LOVELL BEVERLY A	R-3
14	078N B 03800 00009078N	DB-1309 DP-151 PB-2 PP-10	RESIDENTIAL	HUTCHESON PAUL JASON	R-3
15	078N B 03900 00009078N	PB-2 PP-10	RESIDENTIAL	COLEMAN RONALD L	R-3
16	078N B 04000 00009078N	PB-2 PP-10	RESIDENTIAL	LILLARD JERRY	R-3
17	078N B 04100 00009078N	DB-1579 DP-782 PB-2 PP-10	RESIDENTIAL	MILLER THOMAS R	R-3
18	078N C 00100 00009078N	DB-1548 DP-525 PB-2 PP-10	RESIDENTIAL	JOHNSON ANGELA P	R-3
19	078N C 00200 00009078N	DB-5579 DP-609 PB-2 PP-10	RESIDENTIAL	COBIAN SILVIA ANGEL	R-3
20	078N C 00300 00009078N	DB-4158 DP-381 PB-2 PP-10	RESIDENTIAL	VANWORMER SUSAN L	R-3
21	078N C 00400 00009078N	PB-2 PP-10	RESIDENTIAL	MOSS IRENE FROST LOCKE	R-3
22	078N C 00500 00009078N	DB-W863 DP-227 PB-2 PP-10	RESIDENTIAL	WATSON THOMAS W	R-3
23	078N C 00600 00009078N	DB-795 DP-040 PB-2 PP-10	RESIDENTIAL	SMITH STUART C	R-3
24	078N C 00700 00009078N	DB-6159 DP-199 PB-2 PP-10	RESIDENTIAL	ANGELL DAVID B	R-3
25	078N C 00800 00009078N	DB-6506 DP-104 PB-2 PP-10	RESIDENTIAL	CYPRESS GROVE CONST LLC	R-3
26	078N C 00900 00009078N	DB-6392 DP-786 PB-2 PP-10	RESIDENTIAL	BEASLEY MARTHA JANE	R-3
27	078N C 01000 00009078N	DB-6069 DP-975 PB-2 PP-10	RESIDENTIAL	DANCE JOHN	R-3
28	078N C 01100 00009078N	DB-929 DP-346 PB-2 PP-10	RESIDENTIAL	CALDWELL ELA MAE	R-3
29	078N C 01200 00009078N	PB-2 PP-10	RESIDENTIAL	JOHNSON DOROTHY ANN	R-3
30	078N C 01300 00009078N	PB-2 PP-10	RESIDENTIAL	WADDEY JOHN ROBERT	R-3
31	078N C 01400 00009078N	DB-3675 DP-555 PB-2 PP-10	RESIDENTIAL	RAINEY BRENDA GAIL	R-3
32	078N C 01500 00009078N	DB-5373 DP-602 PB-2 PP-10	RESIDENTIAL	JOHNSON RONNIE D	R-3
33	078N C 01600 00009078N	DB-3461 DP-898 PB-2 PP-10	RESIDENTIAL	WARREN MARTIN H	R-3
34	078N C 01700 00009078N	DB-2435 DP-87 PB-2 PP-10	RESIDENTIAL	BOWEN LINDA M	R-3
35	078N C 01800 00009078N	PB-2 PP-10	RESIDENTIAL	PEWITT MAUDENE	R-3
36	078N C 01900 00009078N	DB-786 DP-303 PB-2 PP-10	RESIDENTIAL	HAZELWOOD JULIE ELAINE	R-3
37	078N C 02000 00009078N	PB-8 PP-137	RESIDENTIAL	SMITH SAMUEL A	R-3
38	078N C 02100 00009078N	DB-6189 DP-330 PB-2 PP-10	RESIDENTIAL	LUMLEY MANDI	R-3
39	078N C 02200 00009078N	PB-2 PP-10	RESIDENTIAL	LAMPLEY GWENDOLYN C	R-3
40	078N C 02300 00009078N	PB-2 PP-10	RESIDENTIAL	HENRY JOHN A	R-3
41	078N C 02400 00009078N	PB-2 PP-10	RESIDENTIAL	COVINGTON JAMES ALBERT	R-3
42	078N C 02500 00009078N	DB-1637 DP-215 PB-2 PP-10	RESIDENTIAL	BAKER SAMMIE	R-3
43	078N C 02600 00009078N	PB-2 PP-10	RESIDENTIAL	HOOD WILLIE P	R-3
44	078N D 00500 00009078N	PB-2 PP-10	RESIDENTIAL	MAYCHE LOTTIE T	R-3
45	078N D 00600 00009078N	DB-2404 DP-404 PB-2 PP-10	RESIDENTIAL	GILES TIMOTHY R	R-3
46	078N D 00700 00009078N	DB-4273 DP-804 PB-2 PP-10	RESIDENTIAL	TANNER MICHAEL E	R-3
47	078N D 00800 00009078N	DB-5468 DP-989 PB-2 PP-10	RESIDENTIAL	GREGORY BRANDON	R-3
48	078N D 00900 00009078N	PB-2 PP-10	RESIDENTIAL	PEWITT FELIX L	R-3
49	078N D 01000 00009078N	PB-2 PP-10	RESIDENTIAL	BEAKLEY TED E	R-3
50	078N D 01100 00009078N	DB-5328 DP-191	RESIDENTIAL	ROBESON GERALD W	R-3
51	078N D 01200 00009078N	DB-401 DP-149	RESIDENTIAL	MAYO WILLIAM L	R-3
52	078N D 01300 00009078N	DB-4978 DP-90 PB-2 PP-10	RESIDENTIAL	CHAMBERS HILLARY L	R-3
53	078N D 01400 00009078N	DB-6685 DP-370 PB-2 PP-10	RESIDENTIAL	WILSON CONNIE	R-3
54	078N D 01500 00009078N	DB-2071 DP-360 PB-2 PP-10	RESIDENTIAL	TOMLIN JAMES LEE	R-3
55	078N D 01600 00009078N	DB-6619 DP-99 PB2 PP-10	RESIDENTIAL	SKINNER ANOTHONY W	R-3
56	078N D 01700 00009078N	DB-2211 DP-702 PB-2 PP-10	RESIDENTIAL	GARCIA LETICIA	R-3
57	078N D 01800 00009078N	DB-5830 DP-694 PB-2 PP-10	RESIDENTIAL	COOPER JOSHUA	R-3
58	078N D 01900 00009078N	PB-2 PP-10	RESIDENTIAL	MCMILLAN LAWRENCE G	R-3
59	078N D 02000 00009078N	DB-3323 DP-120 PB-2 PP-10	RESIDENTIAL	SMITH JAMES M	R-3
60	078N D 02100 00009078N	PB-2 PP-10	RESIDENTIAL	LAFEVER CLYDE A	R-3
61	078N D 02200 00009078N	DB-4886 DP-20 PB-2 PP-10	RESIDENTIAL	DANIELS JASON	R-3
62	078N D 02300 00009078N	PB-2 PP-10	RESIDENTIAL	FRASIER JAMES M	R-3
63	078N D 02400 00009078N	PB-2 PP-10	RESIDENTIAL	GRISHAM NORMA JEAN F	R-3
64	078N D 02500 00009078N	DB-4374 DP-478 PB-2 PP-10	RESIDENTIAL	CALDWELL CLAUDINE B LE	R-3
65	078N H 00400 00009078N	DB-756 DP-988 PB-9 PP-112	RESIDENTIAL	BEARD DOUGLAS N	R-2
66	078N H 00500 00009078N	DB-5968 DP-89 PB-9 PP-112	RESIDENTIAL	GIFFEN JOHN M	R-2
67	078N H 00600 00009078N	DB-5409 DP-93 PB-9 PP-112	RESIDENTIAL	HALE JOSEPH ERIK	R-2
68	078N H 00700 00009078N	PB-9 PP-112	RESIDENTIAL	MCNISH CHARLES KENT	R-2
69	078N H 00800 00009078N	DB-5952 DP-546 PB-9 PP-112	RESIDENTIAL	EMERSON IRREVOCABLE TRUST	R-2
70	078N H 00900 00009078N	DB-6668 DP-702 PB-9 PP-112	RESIDENTIAL	DOWLING FREDERICK M	R-2
71	078N H 01000 00009078N	DB-5296 DP-214 PB-9 PP-112	RESIDENTIAL	MCCALEB SAMMIE K	R-2
72	078N H 01100 00009078N	DB-2882 DP-679 PB-9 PP-112	RESIDENTIAL	LAYNE TIMOTHY MARK	R-2
73	078N H 01200 00009078N	DB-2025 DP-869 PB-9 PP-112	RESIDENTIAL	SCOTT DAVID KEITH	R-2
74	078N H 01300 00009078N	DB-4058 DP-988 PB-9 PP-112	RESIDENTIAL	BIRCH ADAM	R-2
75	078N H 03300 00009078N	DB-5351 DP-833 PB-9 PP-112	RESIDENTIAL	BECKNER AMY M	R-2
76	078N H 03400 00009078N	DB-725 DP-428 PB-9 PP-112	RESIDENTIAL	HOFFMAN CARL D	R-2
77	078N H 03500 00009078N	DB-1685 DP-215 PB-9 PP-112	RESIDENTIAL	COLTHARP HUGH GARRISON JR	R-2
78	090C A 00100 00009090C	DB-3357 DP-997	INDUSTRIAL	LMP REALTY INC	LI
79	090C A 00200 00009090C	DB-5256 DP-144	INDUSTRIAL	MANKIN BENJAMIN P	LI
80	090C A 00300 00009090C	DB-5076 DP-917	INDUSTRIAL	GORE EVELYN A	LI
81	090C A 00400 00009078N	DB-5750 DP-652 PB-8 PP-84	INDUSTRIAL	INTELLISTONE INC	LI
82	090C A 00500 00009078N	DB-6386 DP-728 PB-8 PP-84	INDUSTRIAL	BUTLER VENTURES LLC	GC
83	090C A 00501 00009078N	PB-8 PP-84	INDUSTRIAL	J & M PROP LLP	GC
84	090C A 01000 00009090C	DB-4054 DP-67	INDUSTRIAL	PIKE STEPHEN	LI

14 TO 19% SLOPES

20%+ SLOPES

TREE PROTECTION AREAS

N

0 50 100 200

GRAPHIC SCALE

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

CRUNK ENGINEERING

AARON WILSON CRAIG
REGISTERED
AGRICULTURE
No. 114189
STATE OF TENNESSEE
8/04/16

AVONDALE COTTAGES

PUD SUBDIVISION - DEVELOPMENT PLAN

AVONDALE DRIVE
FRANKLIN, TN

REVISIONS	
No.	DATE

08/04/16 15035

C1.1

OVERALL EXISTING CONDITIONS PLAN

From: Johnny Henry [mailto:jhendrill@gmail.com]
Sent: Wednesday, August 24, 2016 2:35 PM
To: Emily Hunter <emily.hunter@franklintn.gov>
Subject: Fwd: Proposed Avondale Cottages / Consideration of Ordinance 2016-32,2016-46

---------- Forwarded message ----------
From: **Johnny Henry** <jhendrill@gmail.com>
Date: Wed, Aug 24, 2016 at 2:27 PM
Subject: Proposed Avondale Cottages / Consideration of Ordinance 2016-32,2016-46
To: emily.hunter@franklin.gov

We would like to thank you in advance for your time and consideration on this matter. We appreciate what you do and the forethought that has been displayed for the citizens of Franklin.

As you may be aware, Avondale Cottages is a proposed development to be located in the Columbia Avenue area, within our city limits. We are not opposed to the growth of Franklin, and the development. We are concerned about the impact on the integrity of the current and future residents of Avondale Drive. We want to be sure that those who are important to our community are aware of these potential issues.

The proposed road leading to the proposed development is currently planning to use Avondale Drive It is likely most of the residents would enter via Columbia Avenue. The proposed section of Avondale Drive, we feel, is not going to be able to safely accommodate the additional traffic that will be created with such a large development, containing forty units.

Like most, the residents on Avondale Drive frequently walk, exercise pets, watch their children play and ride bicycles along the road. Avondale Drive does not have sidewalks. Currently, if two vehicles were passing one another, it leaves a potential for a hazardous condition, in regards to pedestrian safety. Considering the increased traffic, were an additional forty households frequenting this small stretch of road, it would also create the potential for vehicle collision with parked cars and vehicles being required to drive onto resident yards to travel Avondale Drive. There is an additional concern in regards to the potential impact on the traffic situation when entering Columbia Avenue.

There is, currently, a negative traffic situation when existing residents enter Columbia Avenue. A forty unit development has the potential to cause significantly worse traffic issues leading to potential hazards, including delayed emergency response.

It is understood that Franklin's planning department makes an attempt to respect the surrounding establishments and natural features, while maintaining sensitivity to the environment. There are multiple significantly mature pine trees and an oak tree that would likely be affected. The Avondale Drive area, currently has approximately twenty single family dwellings, if you consider a five acre portion. It is understood that Bristol Development has reduced the amount of units to forty. This is still double the amount of residences that these neighborhood roads were intended to support and that is consistent with the surroundings.

Were Bristol Development to consider a smaller number of dwellings and an alternate roadway to the the proposed development, many of the residences would not be forced to suffer the negative impact this development has the potential to create.

Thank you for your time.

Mr. & Mrs. Johnny Henry
207 Avondale Drive
Franklin
(615)351-5885

RESOLUTION 2016-46

TO BE ENTITLED: "A RESOLUTION APPROVING A DEVELOPMENT PLAN FOR AVONDALE COTTAGES PUD SUBDIVISION, FOR THE PROPERTY LOCATED SOUTH OF AVONDALE DRIVE AND EAST OF COLUMBIA AVENUE, 302 AVONDALE DRIVE."

WHEREAS, the Board of Mayor and Aldermen (BOMA) of the City of Franklin, Tennessee, has, or will, approve the zoning for the property as part of Ordinance 2016-32; 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; and

WHEREAS, in accordance with the provisions of *Tennessee Code Annotated* § 13-4-310, as amended, and subject to the exceptions set forth in said statute, the approval of the Development Plan by the BOMA will initiate a vesting period during which the development standards adopted by the City and in effect on the date of approval shall remain the standards applicable to the approved Development Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF MAYOR AND ALDERMEN 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
078N-D01200	3.8
Potion of 078N-D01100	1.5
Total	5.3

A LOT OR PARCEL OF LAND LOCATED IN THE NINTH CIVIL DISTRICT OF WILLIAMSON COUNTY, TENNESSEE AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A 1/2-INCH IRON PIN MARKING THE SOUTHEAST CORNER OF LOT 9, JAMES SUBDIVISION AS RECORDED IN PLAT BOOK 2 PAGE 10 IN THE OFFICE OF THE REGISTER OF DEEDS, WILLIAMSON COUNTY; LOT 9 BEING CURRENTLY OWNED BY TED & DOROTHY BEAKLEY; THENCE ALONG THE BEAKLEY'S EAST PROPERTY LINE, NORTH 7 DEGREES 52 MINUTES 31 SECONDS EAST A DISTANCE OF 124.78 FEET TO A 1/2-INCH OPEN TOP PIPE (BENT) LOCATED ON THE SOUTH RIGHT-OF-WAY MARGIN OF AVONDALE DRIVE (50 FOOT PUBLIC RIGHT-OF-WAY); THENCE ALONG THE SOUTH MARGIN OF SAID AVONDALE DRIVE, SOUTH 82 DEGREES 1 MINUTE 32 SECONDS EAST A DISTANCE OF 80.00 FEET TO A 1/2-INCH CAPPED IRON PIN (STAMPED PLS2939) MARKING THE NORTHWEST CORNER OF LOT 11, JAMES SUBDIVISION THAT IS CURRENTLY OWNED BY HILLARY CHAMBERS; THENCE ALONG THE WEST PROPERTY LINE OF THE CHAMBERS PROPERTY; SOUTH 8 DEGREES 5 MINUTES 22 SECONDS WEST A DISTANCE OF 126.77 FEET TO A 1/2-INCH OPEN TOP PIPE; THENCE ALONG THE SOUTH PROPERTY LINE OF THE CHAMBERS PROPERTY SOUTH 80 DEGREES 31 MINUTES 15 SECONDS EAST A DISTANCE OF 645.13 FEET TO A 5/8-INCH IRON PIN FOUND ON THE NORTH PROPERTY LINE OF AN ABANDONED RAILROAD SPUR; THENCE ALONG SAID ABANDONED SPUR AROUND A CURVE TO THE LEFT HAVING A RADIUS OF 825.00 FEET AND A CHORD BEARING AND DISTANCE OF NORTH 43 DEGREES 24 MINUTES 35 SECONDS EAST 92.11 FEET TO A 1/2-INCH OPEN TOP PIPE; THENCE AROUND A CURVE TO THE LEFT HAVING A RADIUS OF 825.00 FEET AND A CHORD BEARING AND DISTANCE OF NORTH 35 DEGREES 34 MINUTES 17 SECONDS EAST 159.38 FEET TO A 3/4-INCH OPEN TOP PIPE; THENCE AROUND A CURVE TO THE LEFT HAVING A RADIUS OF 825 FEET AND CHORD BEARING AND DISTANCE OF NORTH 27 DEGREES 57 MINUTES 13 SECONDS EAST 79.57 FEET TO A 3/4-INCH OPEN TOP PIPE; THENCE AROUND A CURVE TO THE LEFT HAVING A RADIUS OF 825.00 FEET AND A CHORD BEARING AND DISTANCE OF NORTH 22 DEGREES 2 MINUTES 2 SECONDS EAST 77.94 FEET TO A 1/2-INCH OPEN TOP PIPE; THENCE AROUND A CURVE TO THE LEFT HAVING A RADIUS OF 825.00 FEET AND A CHORD BEARING AND DISTANCE OF NORTH 12 DEGREES 57 MINUTES 10 SECONDS EAST 188.67 FEET TO A 1/2-INCH CAPPED IRON PIN (STAMPED PLS2939) LOCATED ON THE WEST RIGHT-OF-WAY MARGIN OF THE CSX TRANSPORTATION RAILROAD (50 FOOT RIGHT-OF-WAY) THENCE ALONG SAID MARGIN, SOUTH 4 DEGREES 6 MINUTES 22 SECONDS WEST A DISTANCE OF 258.20 FEET TO A 5/8-INCH IRON PIN; THENCE LEAVING SAID MARGIN AROUND A CURVE TO THE RIGHT HAVING A RADIUS OF 875.00 FEET AND A CHORD BEARING AND DISTANCE OF SOUTH 63 DEGREES 55 MINUTES 42 SECONDS WEST 1137.22 FEET TO A 1/2-INCH CAPPED IRON PIN (STAMPED PLS2939); THENCE NORTH 16 DEGREES 1 MINUTE 51 SECONDS EAST A DISTANCE OF 50.01 FEET TO A 1/2-INCH OPEN TOP PIPE; THENCE ALONG THE GERALD & GENETTE ROBESON'S EAST PROPERTY LINE NORTH 16 DEGREES 1 MINUTE 51 SECONDS EAST A DISTANCE OF 311.08 FEET TO A 5/8-INCH IRON PIN; THENCE ALONG THE ROBESON'S NORTH PROPERTY LINE, NORTH 80 DEGREES 31 MINUTES 24 SECONDS WEST A DISTANCE OF 39.92 FEET TO THE POINT OF BEGINNING AND CONTAINING 5.31 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 Avondale Cottages PUD Subdivision are as follows:

Entitlements	Avondale Cottages
Base Zone District	SD-R 7.55
Character Area Overlay	CFCO-3, SOCO-6
Other Zoning Overlays	CAO
Development Standard	Traditional
Number of Dwelling Units	40
Number of Nonresidential Square Footage	N/A
Number of Hotel Rooms	N/A
Connectivity Index	1.67
Open Space Requirements	11,564 sq. ft.
Number of Phases in Development	N/A

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

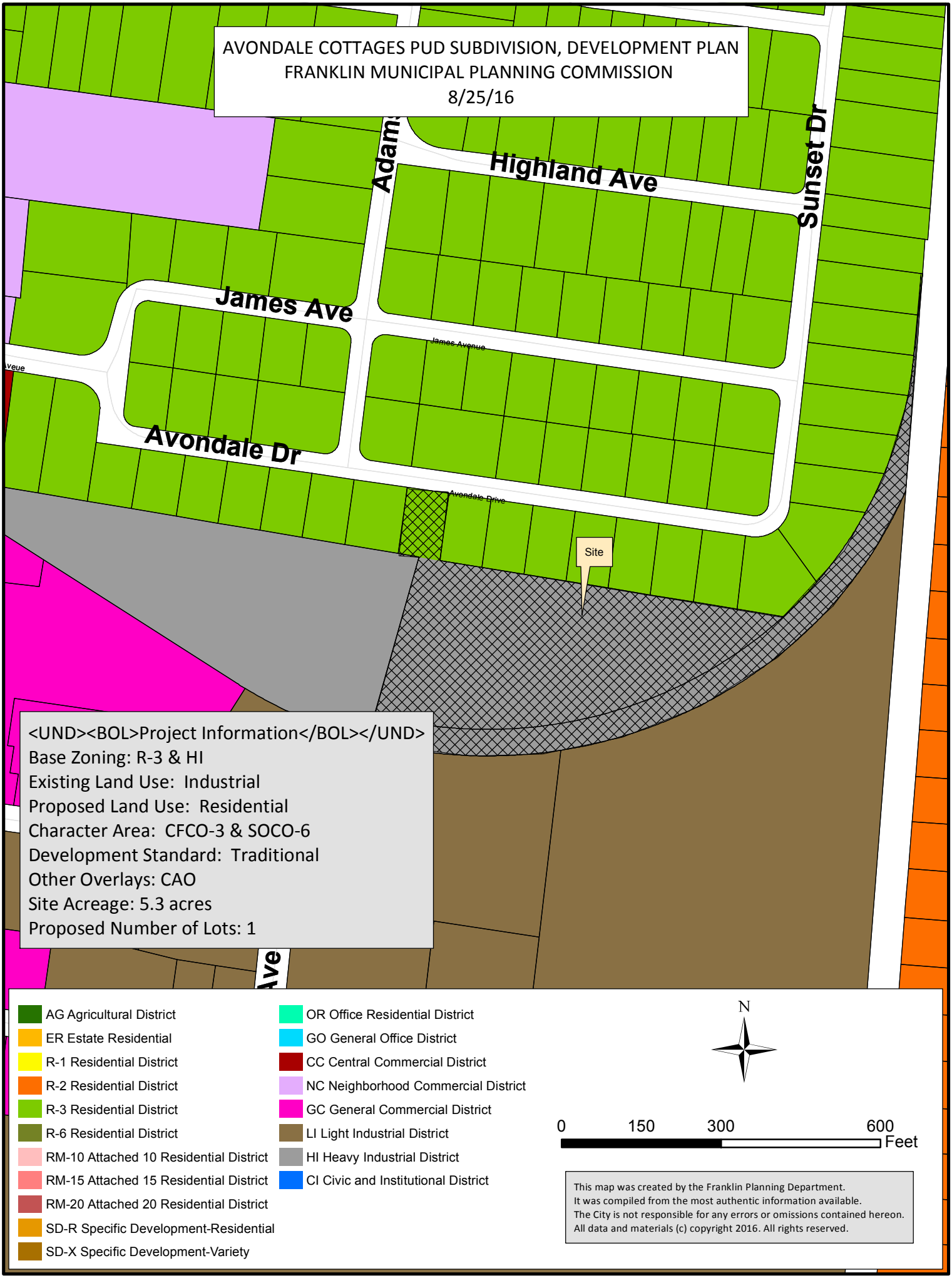
PREAPPLICATION CONFERENCE: _____3/15/2016_____

BOMA/FMPC JOINT CONCEPTUAL WORKSHOP: _____3/25/2016_____

NEIGHBORHOOD MEETING: _____3/29/2016_____

PLANNING COMMISSION RECOMMENDED APPROVAL: _____

PUBLIC HEARING AND BOMA APPROVAL: _____


AVONDALE COTTAGES PUD SUBDIVISION, DEVELOPMENT PLAN
FRANKLIN MUNICIPAL PLANNING COMMISSION
8/25/16
Highland Ave
Sunset Dr
James Ave
James Avenue
Avondale Dr
Avondale Drive
Site
<UND><BOL>Project Information</BOL></UND>
Base Zoning: R-3 & HI
Existing Land Use: Industrial
Proposed Land Use: Residential
Character Area: CFCO-3 & SOCO-6
Development Standard: Traditional
Other Overlays: CAO
Site Acreage: 5.3 acres
Proposed Number of Lots: 1
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 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
150
300
600
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: 6197

CONDITIONS OF APPROVAL:

Engineering - Site Plan Checklist

General Comments

1. E. Roadway Design and Plan & Profile

- For pedestrian safety, a grass strip is recommended to separate the curb and gutter from the sidewalk. At the site plan stage, please consider weaving or meandering the sidewalk to achieve some separation without negatively impacting the existing tress or landscaping.

2. E. Roadway Design and Plan & Profile

- The proposed layout and autoturn exhibit for sanitation vehicles indicates several points where sanitation vehicles will intrude into lots, run over curb, or collide with parked vehicles. Where conflicts occur, the alley intersections shall be revised (widened) to facilitate turning movements of service vehicles.

Apply the alley apron design as uploaded into IDT at the alley T-intersection corners. Where necessary, an additional concrete apron outside of the ROW may be provided to facilitate these turning movements. Any such concrete apron outside of the ROW shall be placed in an access easement and noted on the final plat to be maintained by the HOA.

Fire-Planning

2016-02-29 Avondale Cottages Pre-App Submittal.pdf

3. Access

- As a result of limited access via the alley required for emergency services, the applicant shall provide residential fire sprinklers in the dwellings that front "Street A" (eight lots) and in the dwellings that front the open space (seven lots).

This provision is extended to offset insufficient access via the alley for fire department access concerns.

Planning

2016-02-29 Avondale Cottages Pre-App Submittal.pdf

4. Details of development

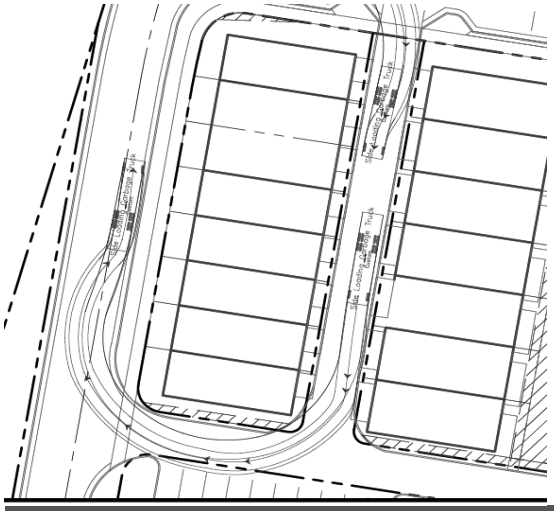
- Applicant shall provide square footage ranges for all proposed buildings. Also, list the maximum height to be two and a half stories (as depicted on your conceptual elevations)

Solid Waste Service

2016-08-04 Avondale PUD Set.pdf

5. Solid Waste Service

- The intersections at the end of the alley ways need to have a safer turning radius for SES refuse trucks to service the lots weekly. Driving on the curb weekly will cause problems in the future.



Water/Sewer

General Comments

6. Utility easement

- Applicant has corrected easement conflict with bio-retention. However in doing so the easement now has structure footing located in them.

Applicant shall make sure no structures encroach on any sewer easements

7. Water Main Location

- Water main location along southern side of development shall be Finalized at site plan

PUD & REZONING

AVONDALE COTTAGES
PUD SUBDIVISION, DEVELOPMENT PLAN

Franklin, Williamson County, Tennessee

CITY OF FRANKLIN PROJECT NO. 6197

AUGUST 4, 2016

SITE DATA

PROJECT NAME	AVONDALE COTTAGES
PROJECT NUMBER:	6197
SUBDIVISION:	N/A
ADDRESS:	302 AVONDALE DRIVE, FRANKLIN
CITY:	FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
OWNER INFO:	GERALD W. ROBESON & GENETTE C. ROBESON 2415 N. BERRY'S CHAPEL RD. FRANKLIN, TN 37069 (615)790-2222 WORK geroldrobeson@aol.com WILLIAM L. MAYO PO BOX 65 CHAPEL HILL, TN 37034 jumpsbyfuzzy@att.net
CIVIL DISTRICT:	9TH
LEGAL DESCRIPTION:	BEING ALL OF PARCEL 12.00, MAP 078N D AND A PORTION OF PARCEL 11.00, MAP 178N D.
ACREAGE OF SITE:	+/- 5.3 ACRES
SQUARE FOOTAGE OF SITE:	231,277.24 SF
EXISTING ZONING	HEAVY INDUSTRIAL DISTRICT (HI)
PROPOSED ZONING	SD-R 7.55
PROPOSED RESIDENTIAL UNITS:	40 TOTAL DWELLINGS 1 (S) SINGLE FAMILY DWELLING 24 (D) DUPLEX UNITS 15 (T) TOWN HOME UNITS
RESIDENTIAL DENSITY:	7.55 DU/A
CHARACTER AREA:	CFCO - 3
OVERLAY:	A PORTION OF THE PROPERTY IS LOCATED WITHIN THE COLUMBIA AVE OVERLAY DISTRICT
DEVELOPMENT STANDARD (PROPOSED):	TRADITIONAL
DRAINAGE BASIN:	HARPETH RIVER
RAILROAD INFRASTRACTURE/ROW	ABANDONED BATTLEFIELD BRANCH OF THE CSX RAILROAD RUNS ALONG THE SOUTHERNEDGE OF THE SUBJECT PROPERTY
PROPOSED SETBACKS:	5' FRONT 5' SIDE 5' REAR
MINIMUM LANDSCAPE SURFACE RATIO:	.20
MINIMUM PARKING REQUIREMENT:	SINGLE FAMILY HOMES = 2 SPACES PER UNIT
PARKING PROVIDED:	GARAGES: 57 DRIVEWAY: 38 ON STREET PARALLEL: 10 SURFACE PARKING: 60 TOTAL: 121 (3.0 PER UNIT)
PARKLAND DEDICATION:	FEES IN LIEU OF PARKLAND DEDICATION SHALL BE PAID PRIOR TO THE RECORDING OF THE FIRST FINAL PLAT FOR THE SUBDIVISION
OPEN SPACE SET-ASIDE: REQUIRED:	10,056.4 SF (5%) FORMAL: 10,056.4 SF (100%) INFORMAL: N/A (0%)
PROVIDED:	11,980 SF (5%) FORMAL: 11,980 SF (5%) INFORMAL: N/A (0%)

SITE AMENITIES - FORMAL OPEN SPACE AMENITIES SHALL INCLUDE: WALKS, SEATING AREAS, BENCHES, LANDSCAPING, AND DECORATIVE STREET LIGHTING. FINAL DESIGNS TO BE DEVELOPED WITH THE SITE PLANS.

EXISTING STRUCTURES:	+/- 20,000SF MANUFACTURING FACILITY
MINERAL RIGHTS:	N/A
GAS EASEMENT:	N/A
TVA EASEMENT:	N/A

MTEMC EASEMENT: 40' ELECTRIC EASEMENT ALONG THE NORTHERN PROPERTY LINE.

TREE CANOPY/PRESERVATION PLAN:

EXISTING TREE CANOPY COVERAGE:	48% OF SITE (111,373 SF)
TREE CANOPY RETENTION (MIN):	21.6% (.48 (EXISTING COVER) X .45 (REQ. RETENTION COVER))
MINIMUM TREE PROTECTION ZONE:	49,995 SF
TREE PROTECTION PROVIDED:	45,426 SF

LIGHTING:

APPROXIMATE LOCATION OF PROPOSED STREET LIGHT. PROPOSED LIGHTING WILL CONSIST OF DECORATIVE STREET POLE LIGHTS AND SHALL BE DESIGNED IN COMPLIANCE WITH CITY OF FRANKLIN AND MIDDLE TENNESSEE ELECTRIC STANDARDS.

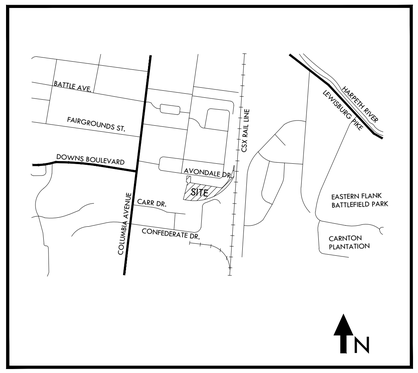
CONNECTIVITY INDEX:

LINKS 5
NODES 3

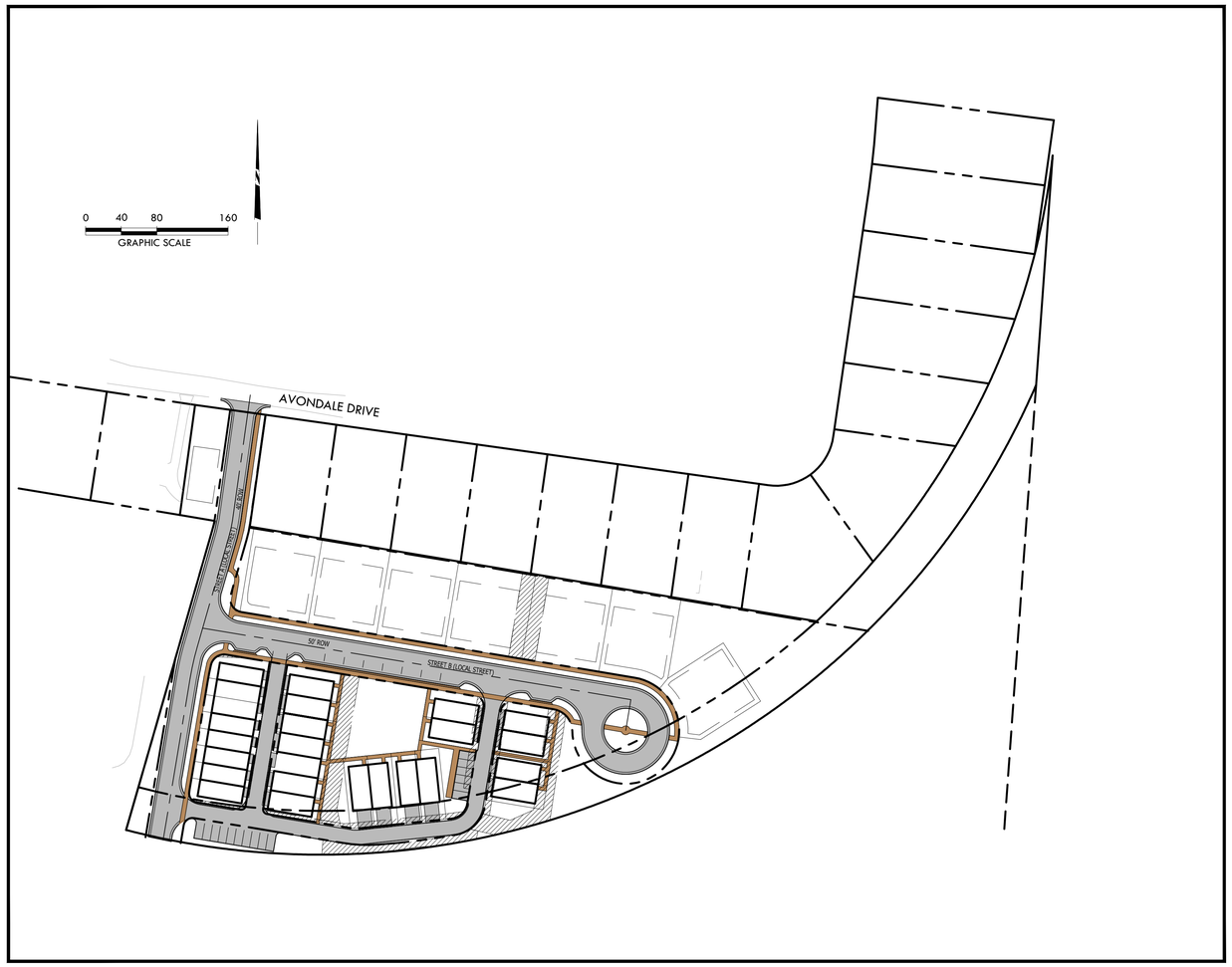
5/3 = 1.67
(1.65 REQUIRED)

PROJECT PHASING:

PROJECT WILL BE DEVELOPED IN ONE PHASE.



VICINITY MAP
NO SCALE



PREPARED FOR:

BRISTOL DEVELOPMENT GROUP
381 MALLORY STATION RD, SUITE 204
FRANKLIN, TENNESSEE
(615)-369-9009

LANDSCAPE ARCHITECT: JASON GODDARD

DESIGN STUDIO
908 HIGH POINT RIDGE ROAD
FRANKLIN, TENNESSEE
(615)-218-8118

INDEX OF SHEETS

SHEET NO.	SHEET TITLE
C0.0	COVER SHEET
C1.0	EXISTING CONDITIONS
C1.1	OVERALL EXISTING CONDITIONS
C2.0	OVERALL DEVELOPMENT PLAN
C3.0	GRADING & DRAINAGE PLAN
C3.1	GENERAL LIGHTING PLAN
C4.0	ACCESS PLAN
C5.0	UTILITY PLAN

STATEMENT OF LUP COMPLIANCE:

As approved through the land use amendment on December 2015, this project complies with the land use plan as a continuation of surrounding residential development.

STATEMENT OF IMPACT - POLICE, FIRE, SOLID WASTE, PARKS:
The proposed project will add 40 residential units. The property is currently developed as an industrial use 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 1.1 mile driving distance from the Police Station; 6 miles driving distance from the nearest fire station on Hwy 96 West.

The project will be served by individual residential dumpsters. Trash pickup will be done by public services.

No new parkland is being dedicated as part of this project. However, this project will contribute to parkland funds. With 40 residential units, 1.03 acres of parkland dedication will be required.

STATEMENT OF IMPACT - STORMWATER:

The proposed development contains a wet weather conveyance that has a formal hydrologic determination from TDEC that will be re-routed through the project site. A combination of stormwater treatment practices will be utilized within this development including pervious pavement and bio-retention.

STATEMENT OF IMPACT - TRANSPORTATION:
The proposed project will add 40 residential units with access along Avondale Drive. The primary road corridor serving the project is Columbia Avenue. A future road connection to Carr Avenue has been accounted for with this project.

STATEMENT OF IMPACTS - WATER AND SEWER:
The proposed project is the construction of 1 single family dwelling, 24 duplex units, and 15 townhome units. The project will result in a projected flow of 14,000 GPD. The site will be served by water off of the existing 6" main in the Avondale Dr ROW with a possible connection to Carr Avenue. Existing sanitary sewer will be re-routed through the project site and extended to serve the new 40 units.

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

AVONDALE COTTAGES
PUD SUBDIVISION - DEVELOPMENT PLAN
AVONDALE DRIVE
FRANKLIN, TN

REVISIONS	
No.	DATE

08/04/16 15035

C0.0

COVER SHEET

14 TO 19% SLOPES

20%+ SLOPES

0 30 60 120
GRAPHIC SCALE

CRUNK ENGINEERING LLC
1894 GENERAL GEORGE PATTON DR.
SUITE 600
FRANKLIN, TN 37067
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AVONDALE COTTAGES

PUD SUBDIVISION - DEVELOPMENT PLAN

AVONDALE DRIVE
FRANKLIN, TN

REVISIONS	
No.	DATE

08/04/16 15035

C1.0

EXISTING CONDITIONS PLAN

ID	PRCLID	DEED / PLAT	LAND USE	OWNER	ZONING
1	078N A 01200 00009078N	DB-1996 DP-867	RESIDENTIAL	EL-URFALI RICHARD I	R-3
2	078N A 01300 00009078N	DB-6579 DP-816 PB-2 PP-10	RESIDENTIAL	SUMIDA MICHAEL S	R-3
3	078N A 01400 00009078N	DB-3534 DP-458 PB-2 PP-10	RESIDENTIAL	HOOD MARY F	R-3
4	078N B 02400 00009078N	DB-4431 DP-394 PB-2 PP-22	RESIDENTIAL	MAUK KAREN ANN	R-3
5	078N B 02500 00009078N	DB-6223 DP-343 PB-2 PP-22	RESIDENTIAL	IMMERFALL MARK D	R-3
6	078N B 02600 00009078N	DB-6260 DP-880 PB-1 PP-78	RESIDENTIAL	WALLACE ERIK ROBERT	R-3
7	078N B 02700 00009078N	DB-1407 DP-577 PB-1 PP-78	RESIDENTIAL	JACKSON LYNN E	R-3
8	078N B 02800 00009078N	DB-5529 DP-155 PB-1 PP-78	RESIDENTIAL	LUFFMAN VIKKI	R-3
9	078N B 03300 00009078N	DB-2940 DP-448 PB-2 PP-10	RESIDENTIAL	BARNES DEBRA A	R-3
10	078N B 03400 00009078N	DB-5733 DP-63 PB-2 PP-10	RESIDENTIAL	MATHIS MICHELLE	R-3
11	078N B 03500 00009078N	DB-1209 DP-00242 PB-2 PP-10	RESIDENTIAL	BYRD THELMA JEAN LANGLEY	R-3
12	078N B 03600 00009078N	DB-5309 DP-173 PB-2 PP-10	RESIDENTIAL	WESSON MACY	R-3
13	078N B 03700 00009078N	DB-4983 DP-183 PB-2 PP-10	RESIDENTIAL	LOVELL BEVERLY A	R-3
14	078N B 03800 00009078N	DB-1309 DP-151 PB-2 PP-10	RESIDENTIAL	HUTCHESON PAUL JASON	R-3
15	078N B 03900 00009078N	PB-2 PP-10	RESIDENTIAL	COLEMAN RONALD L	R-3
16	078N B 04000 00009078N	PB-2 PP-10	RESIDENTIAL	LILLARD JERRY	R-3
17	078N B 04100 00009078N	DB-1579 DP-782 PB-2 PP-10	RESIDENTIAL	MILLER THOMAS R	R-3
18	078N C 00100 00009078N	DB-1548 DP-525 PB-2 PP-10	RESIDENTIAL	JOHNSON ANGELA P	R-3
19	078N C 00200 00009078N	DB-5579 DP-609 PB-2 PP-10	RESIDENTIAL	COBIAN SILVIA ANGEL	R-3
20	078N C 00300 00009078N	DB-4158 DP-381 PB-2 PP-10	RESIDENTIAL	VANWORMER SUSAN L	R-3
21	078N C 00400 00009078N	PB-2 PP-10	RESIDENTIAL	MOSS IRENE FROST LOCKE	R-3
22	078N C 00500 00009078N	DB-W863 DP-227 PB-2 PP-10	RESIDENTIAL	WATSON THOMAS W	R-3
23	078N C 00600 00009078N	DB-795 DP-040 PB-2 PP-10	RESIDENTIAL	SMITH STUART C	R-3
24	078N C 00700 00009078N	DB-6159 DP-199 PB-2 PP-10	RESIDENTIAL	ANGELL DAVID B	R-3
25	078N C 00800 00009078N	DB-6506 DP-104 PB-2 PP-10	RESIDENTIAL	CYPRESS GROVE CONST LLC	R-3
26	078N C 00900 00009078N	DB-6392 DP-786 PB-2 PP-10	RESIDENTIAL	BEASLEY MARTHA JANE	R-3
27	078N C 01000 00009078N	DB-6069 DP-975 PB-2 PP-10	RESIDENTIAL	DANCE JOHN	R-3
28	078N C 01100 00009078N	DB-929 DP-346 PB-2 PP-10	RESIDENTIAL	CALDWELL ELA MAE	R-3
29	078N C 01200 00009078N	PB-2 PP-10	RESIDENTIAL	JOHNSON DOROTHY ANN	R-3
30	078N C 01300 00009078N	PB-2 PP-10	RESIDENTIAL	WADDEY JOHN ROBERT	R-3
31	078N C 01400 00009078N	DB-3675 DP-555 PB-2 PP-10	RESIDENTIAL	RAINEY BRENDA GAIL	R-3
32	078N C 01500 00009078N	DB-5373 DP-602 PB-2 PP-10	RESIDENTIAL	JOHNSON RONNIE D	R-3
33	078N C 01600 00009078N	DB-3461 DP-898 PB-2 PP-10	RESIDENTIAL	WARREN MARTIN H	R-3
34	078N C 01700 00009078N	DB-2435 DP-87 PB-2 PP-10	RESIDENTIAL	BOWEN LINDA M	R-3
35	078N C 01800 00009078N	PB-2 PP-10	RESIDENTIAL	PEWITT MAUDENE	R-3
36	078N C 01900 00009078N	DB-786 DP-303 PB-2 PP-10	RESIDENTIAL	HAZELWOOD JULIE ELAINE	R-3
37	078N C 02000 00009078N	PB-8 PP-137	RESIDENTIAL	SMITH SAMUEL A	R-3
38	078N C 02100 00009078N	DB-6189 DP-330 PB-2 PP-10	RESIDENTIAL	LUMLEY MANDI	R-3
39	078N C 02200 00009078N	PB-2 PP-10	RESIDENTIAL	LAMPLEY GWENDOLYN C	R-3
40	078N C 02300 00009078N	PB-2 PP-10	RESIDENTIAL	HENRY JOHN A	R-3
41	078N C 02400 00009078N	PB-2 PP-10	RESIDENTIAL	COVINGTON JAMES ALBERT	R-3
42	078N C 02500 00009078N	DB-1637 DP-215 PB-2 PP-10	RESIDENTIAL	BAKER SAMMIE	R-3
43	078N C 02600 00009078N	PB-2 PP-10	RESIDENTIAL	HOOD WILLIE P	R-3
44	078N D 00500 00009078N	PB-2 PP-10	RESIDENTIAL	MAYCHE LOTTIE T	R-3
45	078N D 00600 00009078N	DB-2404 DP-404 PB-2 PP-10	RESIDENTIAL	GILES TIMOTHY R	R-3
46	078N D 00700 00009078N	DB-4273 DP-804 PB-2 PP-10	RESIDENTIAL	TANNER MICHAEL E	R-3
47	078N D 00800 00009078N	DB-5468 DP-989 PB-2 PP-10	RESIDENTIAL	GREGORY BRANDON	R-3
48	078N D 00900 00009078N	PB-2 PP-10	RESIDENTIAL	PEWITT FELIX L	R-3
49	078N D 01000 00009078N	PB-2 PP-10	RESIDENTIAL	BEAKLEY TED E	R-3
50	078N D 01100 00009078N	DB-5328 DP-191	RESIDENTIAL	ROBESON GERALD W	R-3
51	078N D 01200 00009078N	DB-401 DP-149	RESIDENTIAL	MAYO WILLIAM L	R-3
52	078N D 01300 00009078N	DB-4978 DP-90 PB-2 PP-10	RESIDENTIAL	CHAMBERS HILLARY L	R-3
53	078N D 01400 00009078N	DB-6685 DP-370 PB-2 PP-10	RESIDENTIAL	WILSON CONNIE	R-3
54	078N D 01500 00009078N	DB-2071 DP-360 PB-2 PP-10	RESIDENTIAL	TOMLIN JAMES LEE	R-3
55	078N D 01600 00009078N	DB-6619 DP-99 PB2 PP-10	RESIDENTIAL	SKINNER ANOTHONY W	R-3
56	078N D 01700 00009078N	DB-2211 DP-702 PB-2 PP-10	RESIDENTIAL	GARCIA LETICIA	R-3
57	078N D 01800 00009078N	DB-5830 DP-694 PB-2 PP-10	RESIDENTIAL	COOPER JOSHUA	R-3
58	078N D 01900 00009078N	PB-2 PP-10	RESIDENTIAL	MCMILLAN LAWRENCE G	R-3
59	078N D 02000 00009078N	DB-3323 DP-120 PB-2 PP-10	RESIDENTIAL	SMITH JAMES M	R-3
60	078N D 02100 00009078N	PB-2 PP-10	RESIDENTIAL	LAFEVER CLYDE A	R-3
61	078N D 02200 00009078N	DB-4886 DP-20 PB-2 PP-10	RESIDENTIAL	DANIELS JASON	R-3
62	078N D 02300 00009078N	PB-2 PP-10	RESIDENTIAL	FRASIER JAMES M	R-3
63	078N D 02400 00009078N	PB-2 PP-10	RESIDENTIAL	GRISHAM NORMA JEAN F	R-3
64	078N D 02500 00009078N	DB-4374 DP-478 PB-2 PP-10	RESIDENTIAL	CALDWELL CLAUDINE B LE	R-3
65	078N H 00400 00009078N	DB-756 DP-988 PB-9 PP-112	RESIDENTIAL	BEARD DOUGLAS N	R-2
66	078N H 00500 00009078N	DB-5968 DP-89 PB-9 PP-112	RESIDENTIAL	GIFFEN JOHN M	R-2
67	078N H 00600 00009078N	DB-5409 DP-93 PB-9 PP-112	RESIDENTIAL	HALE JOSEPH ERIK	R-2
68	078N H 00700 00009078N	PB-9 PP-112	RESIDENTIAL	MCNISH CHARLES KENT	R-2
69	078N H 00800 00009078N	DB-5952 DP-546 PB-9 PP-112	RESIDENTIAL	EMERSON IRREVOCABLE TRUST	R-2
70	078N H 00900 00009078N	DB-6668 DP-702 PB-9 PP-112	RESIDENTIAL	DOWLING FREDERICK M	R-2
71	078N H 01000 00009078N	DB-5296 DP-214 PB-9 PP-112	RESIDENTIAL	MCCALEB SAMMIE K	R-2
72	078N H 01100 00009078N	DB-2882 DP-679 PB-9 PP-112	RESIDENTIAL	LAYNE TIMOTHY MARK	R-2
73	078N H 01200 00009078N	DB-2025 DP-869 PB-9 PP-112	RESIDENTIAL	SCOTT DAVID KEITH	R-2
74	078N H 01300 00009078N	DB-4058 DP-988 PB-9 PP-112	RESIDENTIAL	BIRCH ADAM	R-2
75	078N H 03300 00009078N	DB-5351 DP-833 PB-9 PP-112	RESIDENTIAL	BECKNER AMY M	R-2
76	078N H 03400 00009078N	DB-725 DP-428 PB-9 PP-112	RESIDENTIAL	HOFFMAN CARL D	R-2
77	078N H 03500 00009078N	DB-1685 DP-215 PB-9 PP-112	RESIDENTIAL	COLTHARP HUGH GARRISON JR	R-2
78	090C A 00100 00009090C	DB-3357 DP-997	INDUSTRIAL	LMP REALTY INC	LI
79	090C A 00200 00009090C	DB-5256 DP-144	INDUSTRIAL	MANKIN BENJAMIN P	LI
80	090C A 00300 00009090C	DB-5076 DP-917	INDUSTRIAL	GORE EVELYN A	LI
81	090C A 00400 00009078N	DB-5750 DP-652 PB-8 PP-84	INDUSTRIAL	INTELLISTONE INC	LI
82	090C A 00500 00009078N	DB-6386 DP-728 PB-8 PP-84	INDUSTRIAL	BUTLER VENTURES LLC	GC
83	090C A 00501 00009078N	PB-8 PP-84	INDUSTRIAL	J & M PROP LLP	GC
84	090C A 01000 00009090C	DB-4054 DP-67	INDUSTRIAL	PIKE STEPHEN	LI

14 TO 19% SLOPES

20%+ SLOPES

TREE PROTECTION AREAS

N

0 50 100 200

GRAPHIC SCALE

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

CRUNK ENGINEERING

AARON WILSON CRAIG
REGISTERED
AGRICULTURE
No. 114189
STATE OF TENNESSEE
8/04/16

AVONDALE COTTAGES

PUD SUBDIVISION - DEVELOPMENT PLAN

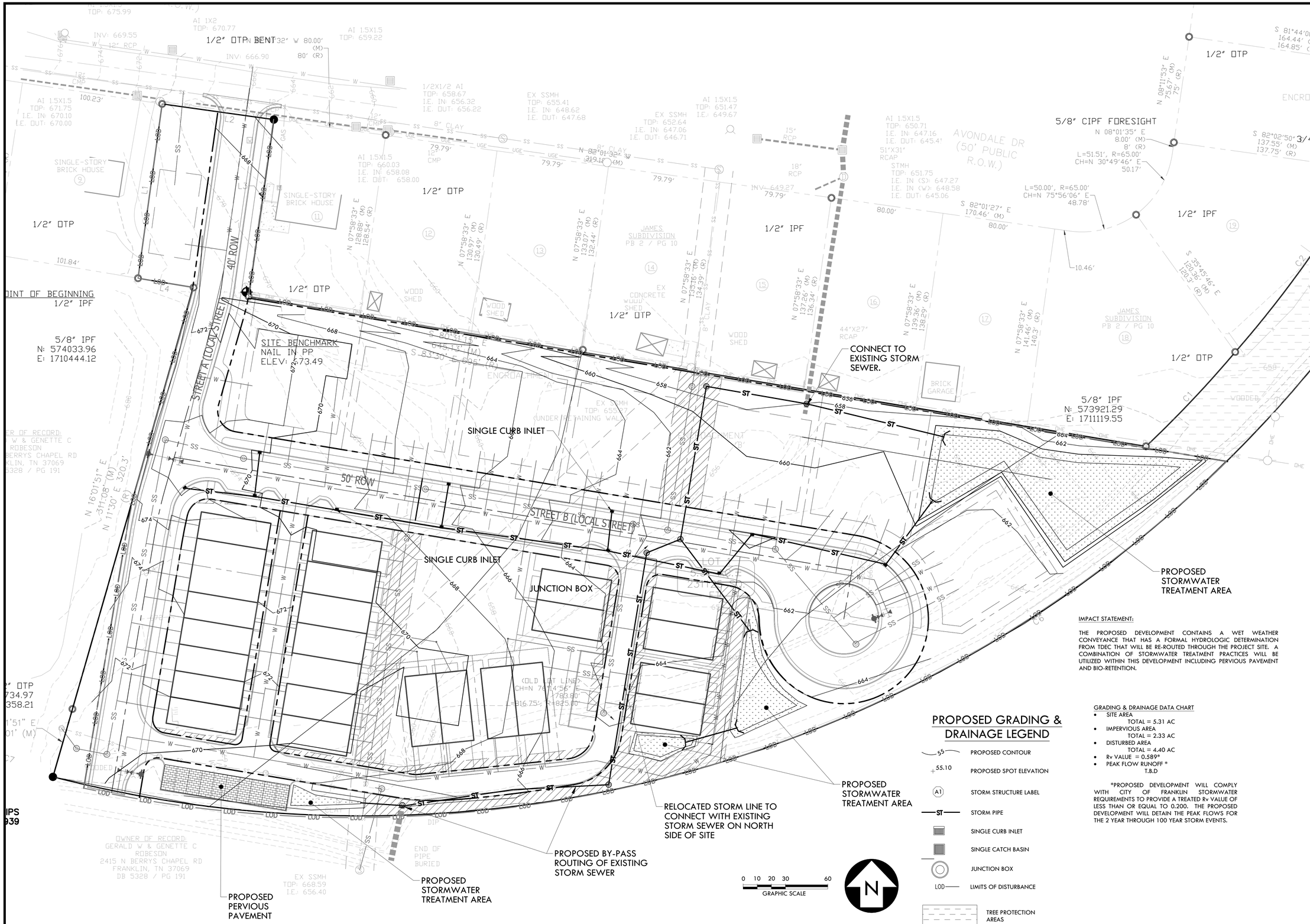
AVONDALE DRIVE
FRANKLIN, TN

REVISIONS	
No.	DATE

08/04/16 15035

C1.1

OVERALL EXISTING CONDITIONS PLAN



PROPOSED GRADING & DRAINAGE LEGEND

55	PROPOSED CONTOUR
55.10	PROPOSED SPOT ELEVATION
A1	STORM STRUCTURE LABEL
ST	STORM PIPE
	SINGLE CURB INLET
	SINGLE CATCH BASIN
	JUNCTION BOX
LOD	LIMITS OF DISTURBANCE
	TREE PROTECTION AREAS

IMPACT STATEMENT:

THE PROPOSED DEVELOPMENT CONTAINS A WET WEATHER CONVEYANCE THAT HAS A FORMAL HYDROLOGIC DETERMINATION FROM TDEC THAT WILL BE RE-ROUTED THROUGH THE PROJECT SITE. A COMBINATION OF STORMWATER TREATMENT PRACTICES WILL BE UTILIZED WITHIN THIS DEVELOPMENT INCLUDING PERVIOUS PAVEMENT AND BIO-RETENTION.

GRADING & DRAINAGE DATA CHART

- SITE AREA
  TOTAL = 5.31 AC
- IMPERVIOUS AREA
  TOTAL = 2.33 AC
- DISTURBED AREA
  TOTAL = 4.40 AC
- Rv VALUE = 0.589*
- 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 STORM EVENTS.

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AVONDALE COTTAGES

PUD SUBDIVISION - DEVELOPMENT PLAN

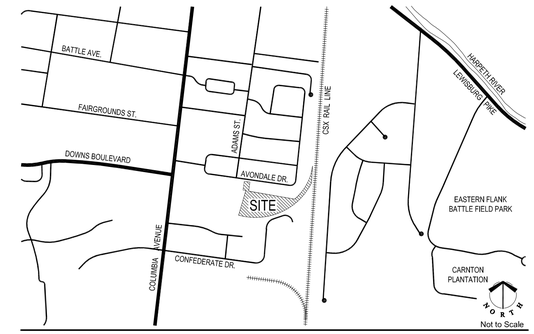
AVONDALE DRIVE
FRANKLIN, TN

REVISIONS	
No.	DATE

08/04/16 15035

C3.0

GRADING & DRAINAGE PLAN



VICINITY:

SITE DATA:

PROJECT NAME:	AVONDALE COTTAGES
PROJECT#:	6197
SUBDIVISION:	N/A
ADDRESS:	302 AVONDALE DRIVE, FRANKLIN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
OWNER INFO:	GERALD W. ROBESON & GENETTE C. ROBEOSN 2415 N. BERRYS CHAPEL RD. FRANKLIN, TN 37069 (615)790-2222 WORK geraldrobeson@aol.com WILLIAM L. MAYO PO BOX 65 CHAPEL HILL, TN 37034 jumpsbyfuzzy@att.net
CIVIL DISTRICT:	9TH
LEGAL DESCRIPTION:	Being all of parcel 12.00, Map 078N D and a portion of parcel 11.00, Map 178N D.
ACREAGE OF SITE:	+/- 5.3 ACRES
SQUARE FOOTAGE OF SITE:	231,277.24 SF
EXISTING ZONING:	HEAVY INDUSTRIAL DISTRICT (HI)
PROPOSED ZONING:	SD-R 7.55
PROPOSED RESIDENTIAL UNITS:	40 TOTAL DWELLINGS 1 (S) SINGLE FAMILY DWELLING 14 (D) DUPLEX UNITS 25 (T) TOWN HOME UNITS
RESIDENTIAL DENSITY:	7.55 DU/A
CHARACTER AREA:	CFCO - 3
OVERLAY:	A portion of the property is located within the Columbia Ave Overlay District.
DEVELOPMENT STANDARD (Proposed):	TRADITIONAL
DRAINAGE BASIN:	HARPETH RIVER
RAILROAD INFRASTRUCTURE/ ROW:	Abandoned Battlefield Branch of the CSX rail Road runs along the southern edge of the subject property.
PROPOSED SETBACKS:	5' FRONT 5' SIDE 5' REAR
MINIMUM LANDSCAPE SURFACE RATIO:	.20
MINIMUM PARKING REQUIREMENT:	SINGLE FAMILY HOMES = 2 SPACES PER UNIT CONDO UNITS: 1 BEDROOM = 1.5 SPACES 2 BEDROOM = 2.5 SPACES 3 BEDROOM = 3.0 SPACES
PARKING PROVIDED:	GARAGES: 57 DRIVEWAY: 38 ON STREET PARALLEL: 10 SURFACE PARKING: 16 TOTAL: 121 (3.0 PER UNIT)
PARKLAND DEDICATION:	FEES IN LIEU OF PARKLAND DEDICATION SHALL BE PAID PRIOR TO THE RECORDING OF THE FIRST FINAL PLAT FOR THIS SUBDIVISION.
OPEN SPACE SET-ASIDE: REQUIRED:	11,564 SF (5%) FORMAL: 11,564 SF (100%) INFORMAL: N/A (0%)
PROVIDED:	11,980 SF (5%) FORMAL: 11,980 SF (5%) INFORMAL: N/A (0%)

SITE AMENITIES - FORMAL OPEN SPACE AMENITIES SHALL INCLUDE: WALKS, SEATING AREAS, BENCHES, LANDSCAPING, AND DECORATIVE STREET LIGHTING. FINAL DESIGNS TO BE DEVELOPED WITH THE SITE PLAN.

RAILROAD INFRASTRUCTURE/ ROW:	Abandoned Battlefield Branch of the CSX rail Road runs along the southern edge of the subject property.
EXISTING STRUCTURES:	+/- 20,000sf Manufacturing facility.

MINERAL RIGHTS: N/A
GAS EASEMENT: N/A
TVA EASEMENT: N/A
MTEMC EASEMENT: 40' Electric Easement along northern property line.

TREE CANOPY/ PRESERVATION PLAN:

EXISTING TREE CANOPY COVERAGE:	48% OF SITE (111,373 SF)
TREE CANOPY RETENTION (MIN):	21.6% (.48 [EXISTING COVER] X .45 [REQ. RETENTION COVER])
MINIMUM TREE PROTECTION ZONE:	49,995 SF
TREE PROTECTION PROVIDED:	45,426 SF

LIGHTING:

✧ APPROXIMATE LOCATION OF PROPOSED STREET LIGHT. PROPOSED LIGHTING WILL CONSIST OF DECORATIVE STREET POLE LIGHTS AND SHALL BE DESIGNED IN COMPLIANCE WITH CITY OF FRANKLIN AND MIDDLE TENNESSEE ELECTRIC STANDARDS.

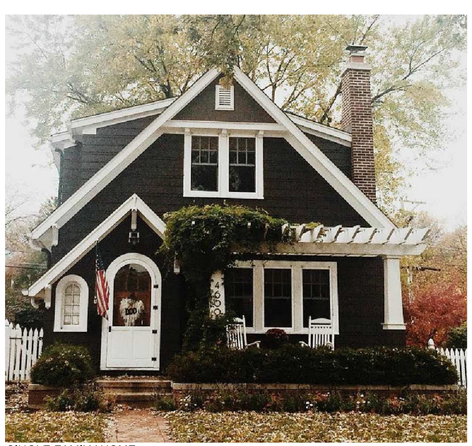
CONNECTIVITY INDEX:

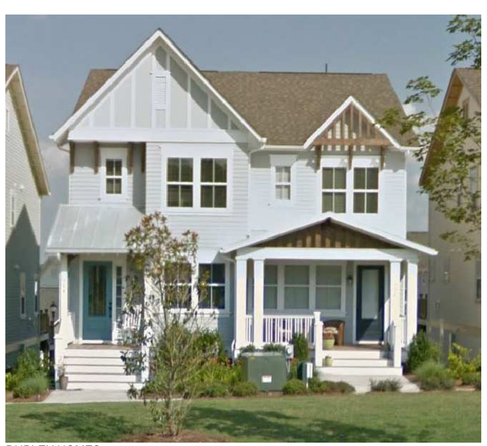
● LINKS 5
X NODES 3

5 / 3 = 1.67
(1.65 REQUIRED)

PROJECT PHASING:

PROJECT WILL BE DEVELOPED IN ONE PHASE.


SINGLE FAMILY HOME


DUPLEX HOMES

TOWNHOMES/ COMMUNITY OVERVIEW

STATEMENT OF ARCHITECTURAL INTENT:

- ELEVATIONS SHALL INCLUDING A VARIETY OF BRICK, SIMULATED STONE, AND CEMENTATIOUS SIDING.
- BUILDING HEIGHT SHALL BE 3 STORY MAXIMUM (THIRD STORY WILL BE WITH IN ROOF LINE TO APPEAR AS 2 OR 2 1/2 STORY STRUCTURES.
- IMAGES SHOWN ARE CONCEPTUAL REPRESENTATION OF THE PROPOSED ARCHITECTURAL STYLE AND MASSING

DesignStudio
LANDSCAPE ARCHITECTURE | PLANNING | URBAN DESIGN | VISIONING
908 High Point Ridge Road, Franklin Tennessee
(p):615.218.8118

Avondale Cottages - PUD Subdivision

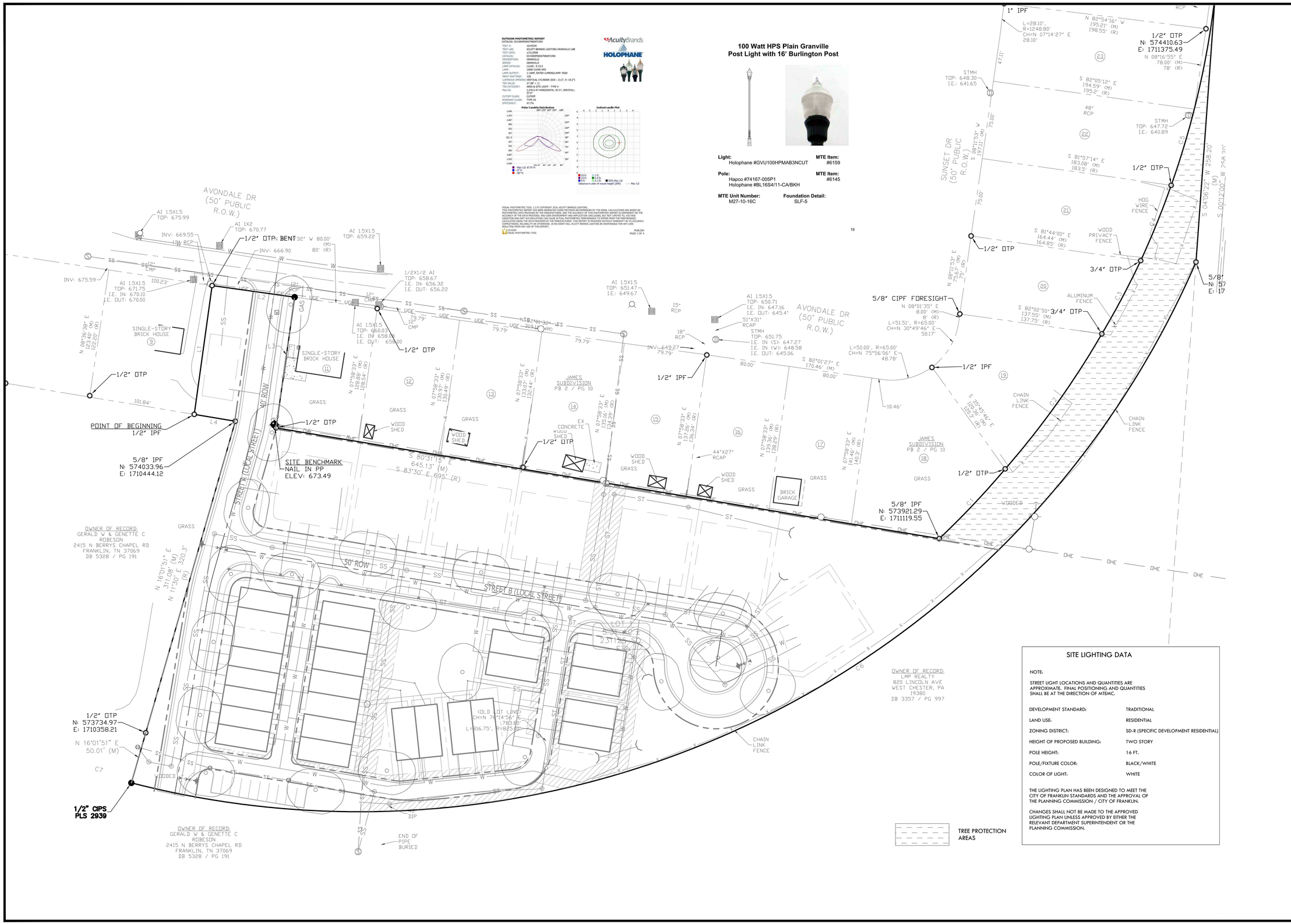
Development Plan
Avondale Drive, Franklin, Tennessee

Development Plan

date. 7/11/16
revisions.
8/4/16 - Per Staff Comments

project no. 14054
scale. shown on plan

C 2.0
C.O.F. #6197



SITE LIGHTING DATA

NOTE:

STREET LIGHT LOCATIONS AND QUANTITIES ARE APPROXIMATE. FINAL POSITIONING AND QUANTITIES SHALL BE AT THE DIRECTION OF MTEMC.

DEVELOPMENT STANDARD:	TRADITIONAL
LAND USE:	RESIDENTIAL
ZONING DISTRICT:	SD-R (SPECIFIC DEVELOPMENT RESIDENTIAL)
HEIGHT OF PROPOSED BUILDING:	TWO STORY
POLE HEIGHT:	16 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.

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

AVONDALE COTTAGES

PUD SUBDIVISION - DEVELOPMENT PLAN

AVONDALE DRIVE
FRANKLIN, TN

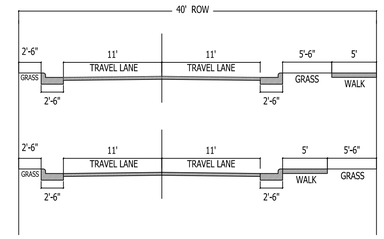
REVISIONS	
No.	DATE

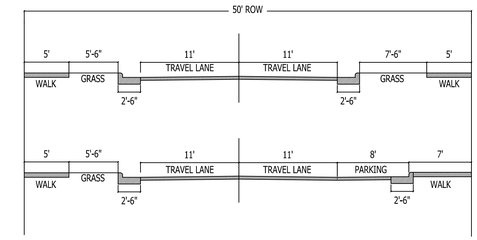
08/04/16 15035

C3.1

LIGHT PLAN

FIRE TRUCK TRAVEL PATH



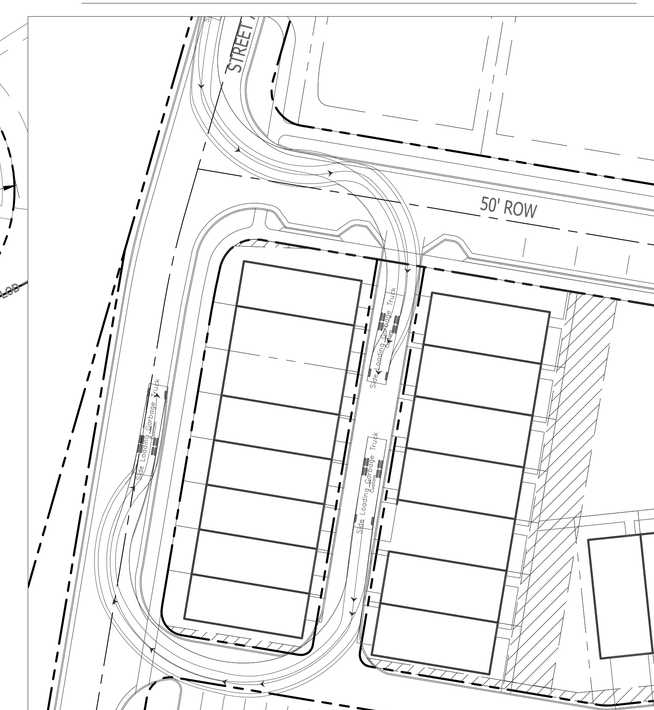


STATEMENT OF IMPACT:
The proposed project will add 40 residential units with access along Avondale Drive. The primary road corridor serving the project is Columbia Avenue. A future road connection to Carr Avenue has been accounted for with this project.

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'

GARBAGE TRUCK TRAVEL PATH THROUGH ALLEY



TREE PROTECTION AREAS

0 10 20 30 60
GRAPHIC SCALE

N

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

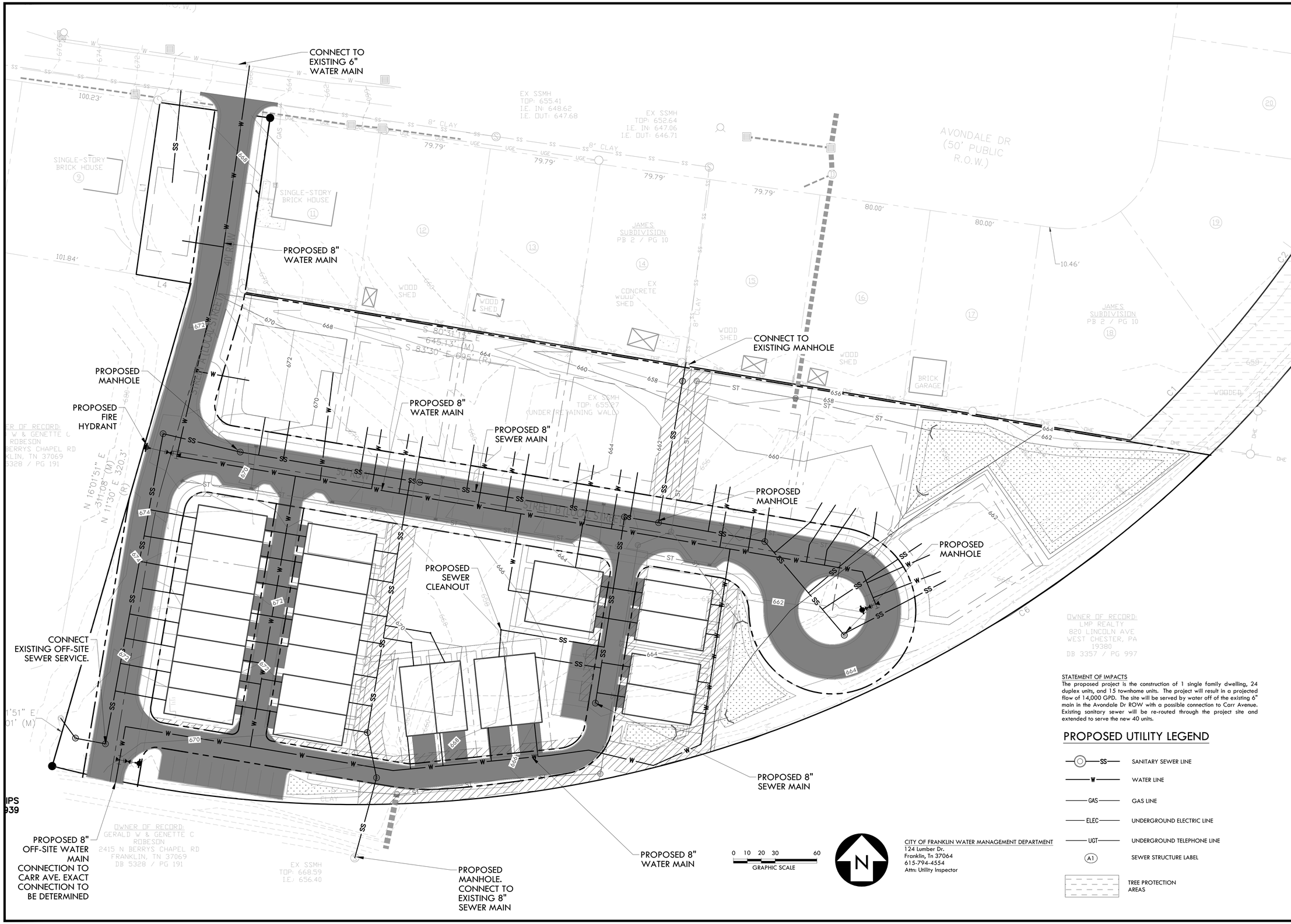
AVONDALE COTTAGES
PUD SUBDIVISION - DEVELOPMENT PLAN
AVONDALE DRIVE
FRANKLIN, TN

REVISIONS

No.	DATE

08/04/16 15035

C4.0
ACCESS PLAN



STATEMENT OF IMPACTS

The proposed project is the construction of 1 single family dwelling, 24 duplex units, and 15 townhome units. The project will result in a projected flow of 14,000 GPD. The site will be served by water off of the existing 6" main in the Avondale Dr ROW with a possible connection to Carr Avenue. Existing sanitary sewer will be re-routed through the project site and extended to serve the new 40 units.

PROPOSED UTILITY LEGEND

—SS—	SANITARY SEWER LINE
—W—	WATER LINE
—GAS—	GAS LINE
—ELEC—	UNDERGROUND ELECTRIC LINE
—UGT—	UNDERGROUND TELEPHONE LINE
A1	SEWER STRUCTURE LABEL
	TREE PROTECTION AREAS

CITY OF FRANKLIN WATER MANAGEMENT DEPARTMENT
124 Lumber Dr.
Franklin, Tn 37064
615-794-4554
Attn: Utility Inspector

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

AVONDALE COTTAGES

PUD SUBDIVISION - DEVELOPMENT PLAN

AVONDALE DRIVE
FRANKLIN, TN

REVISIONS	
No.	DATE

08/04/16 15035

C5.0

UTILITY PLAN

From: Johnny Henry [mailto:jhendrill@gmail.com]
Sent: Wednesday, August 24, 2016 2:35 PM
To: Emily Hunter <emily.hunter@franklintn.gov>
Subject: Fwd: Proposed Avondale Cottages / Consideration of Ordinance 2016-32,2016-46

---------- Forwarded message ----------
From: **Johnny Henry** <jhendrill@gmail.com>
Date: Wed, Aug 24, 2016 at 2:27 PM
Subject: Proposed Avondale Cottages / Consideration of Ordinance 2016-32,2016-46
To: emily.hunter@franklin.gov

We would like to thank you in advance for your time and consideration on this matter. We appreciate what you do and the forethought that has been displayed for the citizens of Franklin.

As you may be aware, Avondale Cottages is a proposed development to be located in the Columbia Avenue area, within our city limits. We are not opposed to the growth of Franklin, and the development. We are concerned about the impact on the integrity of the current and future residents of Avondale Drive. We want to be sure that those who are important to our community are aware of these potential issues.

The proposed road leading to the proposed development is currently planning to use Avondale Drive It is likely most of the residents would enter via Columbia Avenue. The proposed section of Avondale Drive, we feel, is not going to be able to safely accommodate the additional traffic that will be created with such a large development, containing forty units.

Like most, the residents on Avondale Drive frequently walk, exercise pets, watch their children play and ride bicycles along the road. Avondale Drive does not have sidewalks. Currently, if two vehicles were passing one another, it leaves a potential for a hazardous condition, in regards to pedestrian safety. Considering the increased traffic, were an additional forty households frequenting this small stretch of road, it would also create the potential for vehicle collision with parked cars and vehicles being required to drive onto resident yards to travel Avondale Drive. There is an additional concern in regards to the potential impact on the traffic situation when entering Columbia Avenue.

There is, currently, a negative traffic situation when existing residents enter Columbia Avenue. A forty unit development has the potential to cause significantly worse traffic issues leading to potential hazards, including delayed emergency response.

It is understood that Franklin's planning department makes an attempt to respect the surrounding establishments and natural features, while maintaining sensitivity to the environment. There are multiple significantly mature pine trees and an oak tree that would likely be affected. The Avondale Drive area, currently has approximately twenty single family dwellings, if you consider a five acre portion. It is understood that Bristol Development has reduced the amount of units to forty. This is still double the amount of residences that these neighborhood roads were intended to support and that is consistent with the surroundings.

Were Bristol Development to consider a smaller number of dwellings and an alternate roadway to the the proposed development, many of the residences would not be forced to suffer the negative impact this development has the potential to create.

Thank you for your time.

Mr. & Mrs. Johnny Henry
207 Avondale Drive
Franklin
(615)351-5885

ORDINANCE 2016-44

TO BE ENTITLED, "AN ORDINANCE TO REZONE 2.90 ACRES FROM GC – GENERAL COMMERCIAL DISTRICT TO CI – CIVIC AND INSTITUTIONAL DISTRICT FOR THE PROPERTY LOCATED NORTH OF MURFREESBORO ROAD AND WEST OF EDWARD CURD LANE."

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

WHEREAS, the CI - Civic-Institutional District provides zoning for land uses compatible with both the Franklin Land Use Plan and surrounding development; 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 ALDERMEN 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 **General Commercial** District to **Civic and Institutional** District:

PREMISES CONSIDERED

Map-Parcel	Acres
079---046.01	2.90
Total	2.90

Beginning at an iron rod (old) in the westerly right-of-way line of Edward Curd Lane, right-of-way width varies, in the southerly property line of the Williamson Medical Center property; said iron rod being the northeasterly property corner of the herein described tract; thence,

1. With the westerly right-of-way line of Edward Curd Lane, S 09°44'56" West, 234.41 feet to an iron rod (old) at the northeasterly property corner of Lot No. 1 as shown on the aforementioned Plan of Byrd D. Cain Property & Lads, Inc. Property; thence,
2. Leaving the westerly right-of-way line of Edward Curd Lane and with the northerly property line of said Lot No. 1, N 73°35'41" W, 174.74 feet to a P.K. Nail (old); thence
3. South 16°41'30" W, 14.79 feet to a P.K. Nail (old); thence,
4. North 73°20'15" W, 448.27 feet to an iron rod (old) in the easterly right-of-way margin of Interstate 65; thence,
5. With the easterly margin of Interstate 65, North 03°06'25" W, 159.69 feet to an iron rod (old) in the southwesterly property line of the aforementioned Williamson Medical Center property; thence,
6. With the south property line of said Williamson Medical Center, in part, South 81°55'40" E, 656.16 feet to the Point of Beginning and containing 126,307 or 2.90 acres, more or less, as calculated by the above courses and distances.

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: _____

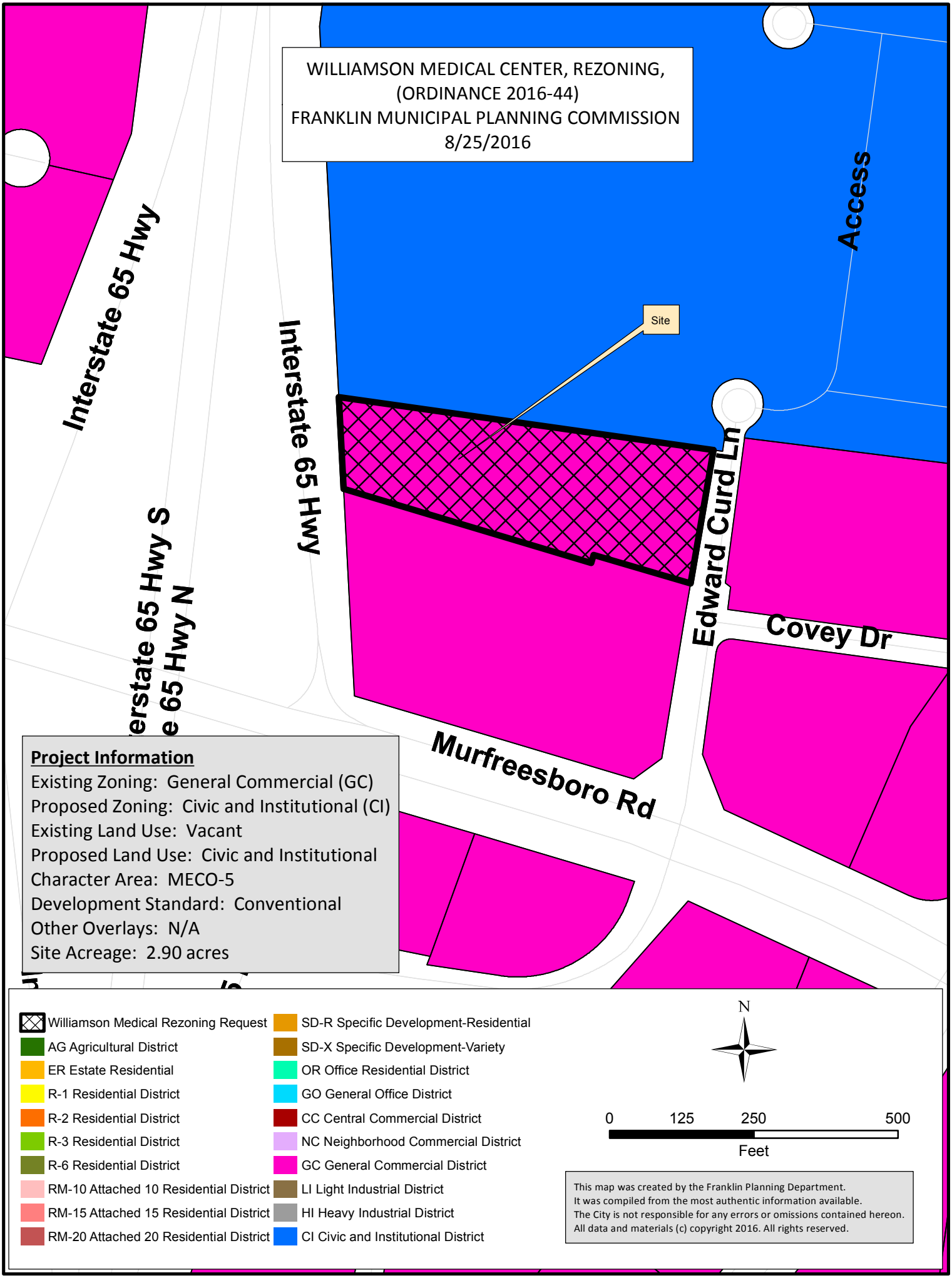
PASSED FIRST READING: _____

PUBLIC HEARING HELD: _____

PASSED SECOND READING: _____

PASSED THIRD READING: _____

Law Dept. approved 08.10.16


WILLIAMSON MEDICAL CENTER, REZONING,
(ORDINANCE 2016-44)
FRANKLIN MUNICIPAL PLANNING COMMISSION
8/25/2016
Interstate 65 Hwy
Interstate 65 Hwy
Interstate 65 Hwy S
Interstate 65 Hwy N
Access
Site
Edward Curd Ln
Covey Dr
Murfreesboro Rd
Project Information
Existing Zoning: General Commercial (GC)
Proposed Zoning: Civic and Institutional (CI)
Existing Land Use: Vacant
Proposed Land Use: Civic and Institutional
Character Area: MECO-5
Development Standard: Conventional
Other Overlays: N/A
Site Acreage: 2.90 acres
Williamson Medical Rezoning Request
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 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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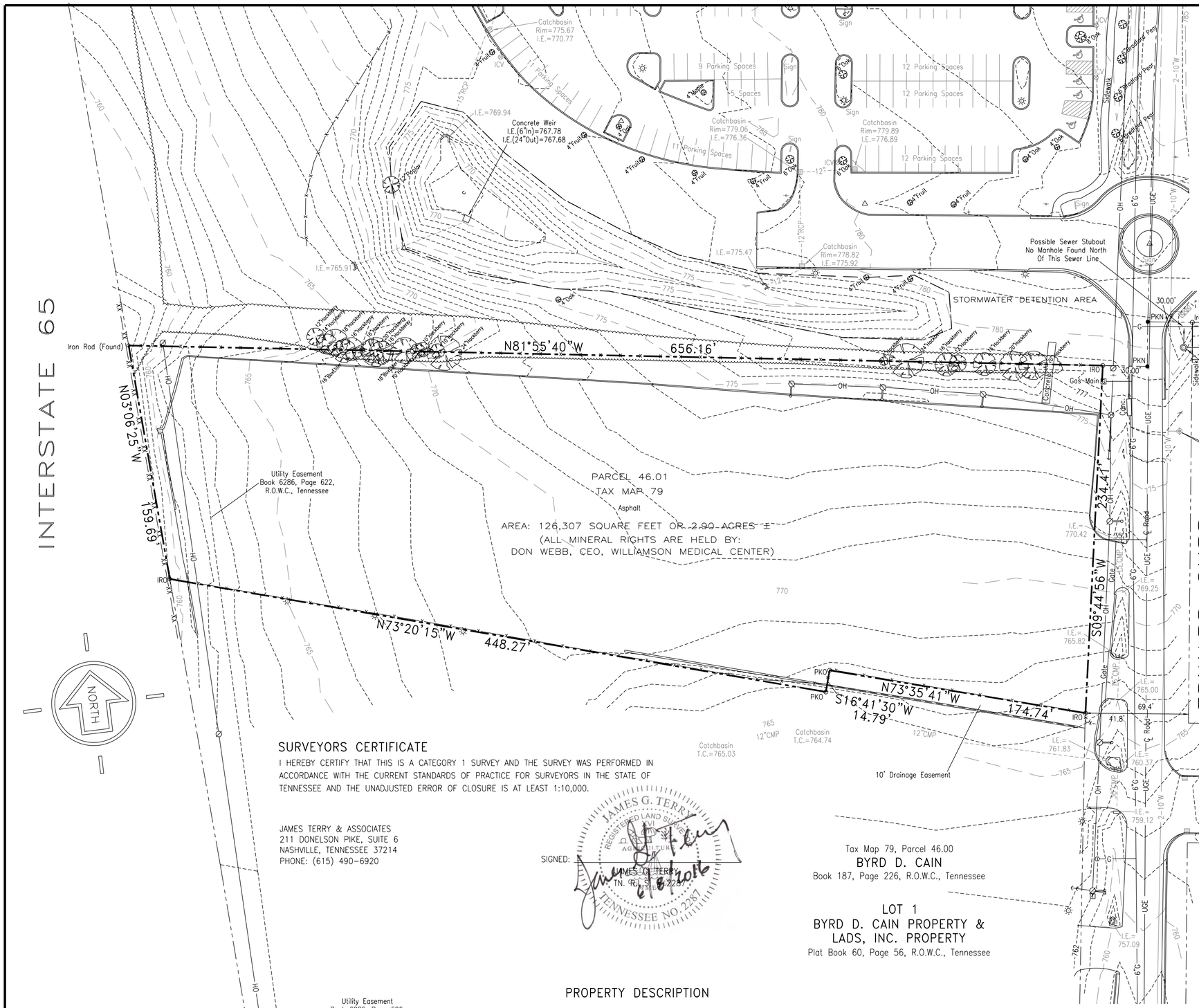
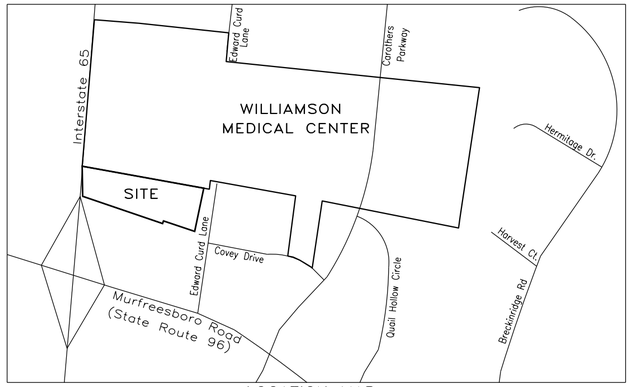




LOCATION MAP
(NOT TO SCALE)

Tax Map 79-K, Group "A", Parcel 1.00
WINDROSE PHYSICIANS PLAZA PROPERTIES, LLC
Book 4327, Page 342, R.O.W.C., Tennessee

LOT 1
QUAIL HOLLOW BUSINESS PARK SUBDIVISION
SECTION ONE
Plat Book 10, Page 198, R.O.W.C., Tennessee

Tax Map 79, Parcel 46.00
BYRD D. CAIN
Book 187, Page 226, R.O.W.C., Tennessee

LOT 1
BYRD D. CAIN PROPERTY &
LADS, INC. PROPERTY
Plat Book 60, Page 56, R.O.W.C., Tennessee

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THIS IS A CATEGORY 1 SURVEY AND THE SURVEY WAS PERFORMED IN ACCORDANCE WITH THE CURRENT STANDARDS OF PRACTICE FOR SURVEYORS IN THE STATE OF TENNESSEE AND THE UNADJUSTED ERROR OF CLOSURE IS AT LEAST 1:10,000.

JAMES TERRY & ASSOCIATES
211 DONELSON PIKE, SUITE 6
NASHVILLE, TENNESSEE 37214
PHONE: (615) 490-6920

SIGNED: JAMES G. TERRY, R.L.S. TN. REG. NO. 2287 — 6/8/2016

JAMES G. TERRY — REGISTERED LAND SURVEYOR — TENNESSEE NO. 2287

PROPERTY DESCRIPTION

BEING LOT NO. 2 ON THE PLAN OF BYRD D. CAIN PROPERTY & LADS, INC. PROPERTY AS SHOWN ON PLAT OF RECORD IN PLAT BOOK 60, PAGE 56, IN THE REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE, TO WHICH PLAT REFERENCE IS HEREBY MADE FOR A MORE PARTICULAR DESCRIPTION.

PROPERTY TITLE REFERENCE

BEING THE SAME PROPERTY CONVEYED TO WILLIAMSON COUNTY HOSPITAL DISTRICT d/b/a WILLIAMSON MEDICAL CENTER AS OF RECORD IN BOOK 6299, PAGE 372, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.

APPLICANT/OWNER
Don Webb-CEO-Williamson Medical Center
P.O. Box 1800 Franklin, TN 37064
Email: dwebb@wmed.org
Phone: (615)435-5000

PROPERTY DESCRIPTION

A tract of land in the Ninth Civil District of Williamson County, City of Franklin, Tennessee, being shown as Lot No. 2 as shown on the Plan of Byrd D. Cain Property & Lads, Inc. Property as of record in Plat Book 60, Page 56, Register's Office for Williamson County, Tennessee and being more particularly described as follows:

Beginning at an iron rod (old) in the westerly right-of-way line of Edward Curd Lane, right-of-way width varies, in the southerly property line of the Williamson Medical Center property; said iron rod being the northeasterly property corner of the herein described tract; thence,

1. With the westerly right-of-way line of Edward Curd Lane, South 09 degrees 44 minutes 56 seconds West, 234.41 feet to an iron rod (old) at the northeasterly property corner of Lot No. 1 as shown on the aforementioned Plan of Byrd D. Cain Property & Lads, Inc. Property; thence,
2. Leaving the westerly right-of-way line of Edward Curd Lane and with the northerly property line of said Lot No. 1, North 73 degrees 35 minutes 41 seconds West, 174.74 feet to a P.K. Nail (old); thence,
3. South 16 degrees 41 minutes 30 seconds West, 14.79 feet to a P.K. Nail (old); thence,
4. North 73 degrees 20 minutes 15 seconds West, 448.27 feet to an iron rod (old) in the easterly right-of-way margin of Interstate 65; thence,
5. With the easterly margin of Interstate 65, North 03 degrees 06 minutes 25 seconds West, 159.69 feet to an iron rod (old) in the southwesterly property line of the aforementioned Williamson Medical Center property; thence,
6. With the south property line of said Williamson Medical Center, in part, South 81 degrees 55 minutes 40 seconds East, 656.16 feet to the Point Of Beginning and containing 126,307 square feet or 2.90 acres, more or less, as calculated by the above courses and distances.

Scale : 1" = 50'

0' 25' 50' 100' 150'
GRAPHIC SCALE

BOUNDARY & TOPOGRAPHIC SURVEY

WILLIAMSON MEDICAL CENTER

4321 CAROTHERS PARKWAY
CITY OF FRANKIN. WILLIAMSON COUNTY, TENNESSEE
NINTH CIVIL DISTRICT

JAMES TERRY & ASSOCIATES
LAND SURVEYORS
201 DONELSON PIKE, SUITE 6
NASHVILLE, TENNESSEE 37214
PHONE: (615) 490-6920

DATE: JULY 25, 2012
DWN. BY: GREG TERRY

COF no: 6204
JOB NO. *2016-314*

Labeled Parcels Fall Within 500' Buffer Of Subject Property & Are Designated As "Either Standards Apply" Development Area Standards & Are Within The "McEwen" Character Area.

Williamson Medical Center Parcel Rezoning
Base Zoning, Overlay Zoning & Existing Land Use
COF no: 6204

Smith Seckman Reid, Inc.
2995 Sidco Drive
Nashville, TN 37204
615.383.1113
Fax: 615.386.8469
ssr-inc.com

ORDINANCE 2016-34

TO BE ENTITLED, "AN ORDINANCE TO REZONE 19.99 ACRES FROM CIVIC AND INSTITUIONAL (CI) DISTRICT TO SPECIFIC DEVELOPMENT RESIDENTIAL (SR-R 13.5) DISTRICT AND REMOVE THE SCIENTIFIC RESEARCH ZONING OVERLAY (SRO) DISTRICT FOR THE PROPERTY LOCATED NORTH OF MACK HATCHER PARKWAY AND EAST OF FRANKLIN ROAD, 145 LEGENDS CLUB 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 (SD-R) district provides zoning for land uses compatible with both the Franklin Land Use Plan and surrounding development; and

WHEREAS, the Board of Mayor and Aldermen (BOMA) of the City of Franklin, Tennessee, adopted Resolution 2016-50, 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 ALDERMEN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

SECTION I. That the following described property shall be, and is hereby, rezoned from its present base zoning classification of Civic and Institutional (CI) District to Specific Development Residential (SD-R 13.5) District, and the Scientific Research Overlay (SRO) overlay district is hereby removed from the property:

PREMISES CONSIDERED

Map-Parcel	Acres
062---04300	19.99
Total	19.99

Legal Description

Being a tract of land lying in the 8th District of Williamson County, Franklin, Tennessee. Tract being Lot 84 of Aspen Grove, Section V as recorded in Plat Book 13, Page 60, Register's Office of Williamson County, Tennessee (ROWC). Bounded on the west by the eastern Right-of Way (ROW) of U.S. Highway 31 (Franklin Road) and by Lot 1 of Aspen Grove PUD Subdivision as recorded in Plat Book 13, Page 21, ROWC, on the north by said Lot 1 of Aspen Grove PUD Subdivision and by the southern ROW of Legends Club Lane, on the east by Lot 93 of Aspen Grove, Section A as recorded in Plat Book 15, Page 52, ROWC, and on the south by the northern charter ROW of CSX Railroad and the northern ROW of Mack Hatcher Parkway. Tract being more particularly described as follows:

POINT OF BEGINNING being a concrete monument at the intersection of the northern ROW of said Mack Hatcher Parkway and the eastern ROW of said Franklin Road; thence

with the eastern ROW of said Franklin Road, North 35°57'28" East 176.28 feet to an iron rod with RLS# 2039 cap; thence North 26°25'08" East 403.11 feet to a ½" iron rod; thence North 33°47'34" East 61.22 feet to a point; thence leaving the ROW of said Franklin Road with the common line of said Lot 1 of Aspen Grove PUD Subdivision, South 56°24'58" East 922.54 feet to a concrete monument; thence North 33°35'02" East 573.18 feet to an iron rod with RLS# 2039 cap; thence with the southern ROW of said Legends Club Lane along a curve to the left having a length of 104.41 feet, a radius of 630.00 feet, a central angle of 09°29'44", and having a chord bearing and distance of South 72°54'14" East 104.29 feet to a ½" iron rod; thence leaving said ROW of Legends Club Lane with the common line of said Lot 93 of Aspen Grove, Section A, South 33°35'02" West 602.78 feet to a fencepost; thence South 28°19'20" East 656.70 feet to a ½" iron rod; thence with the charter ROW of said CSX Railroad, South 64°31'29" West 83.17 feet to an iron rod with RLS# 2039 cap; thence with a curve to the left having a length of 198.12 feet, a radius of 6131.57 feet, a central angle of 01°51'05", and having a chord bearing and distance of South 65°27'36" West 198.11 feet to an iron rod with RLS# 2039 cap; thence leaving said charter ROW of CSX Railroad with the northern ROW of said Mack Hatcher Parkway, North 60°02'45" West 838.90 feet to a concrete monument; thence North 54°40'18" West 315.30 feet to a concrete monument; thence North 66°15'16" West 263.23 feet to the point of beginning. Tract contains 870,808 square feet, or 19.99 acres. Bearings based on Tennessee State Plane Coordinate System.

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: _____

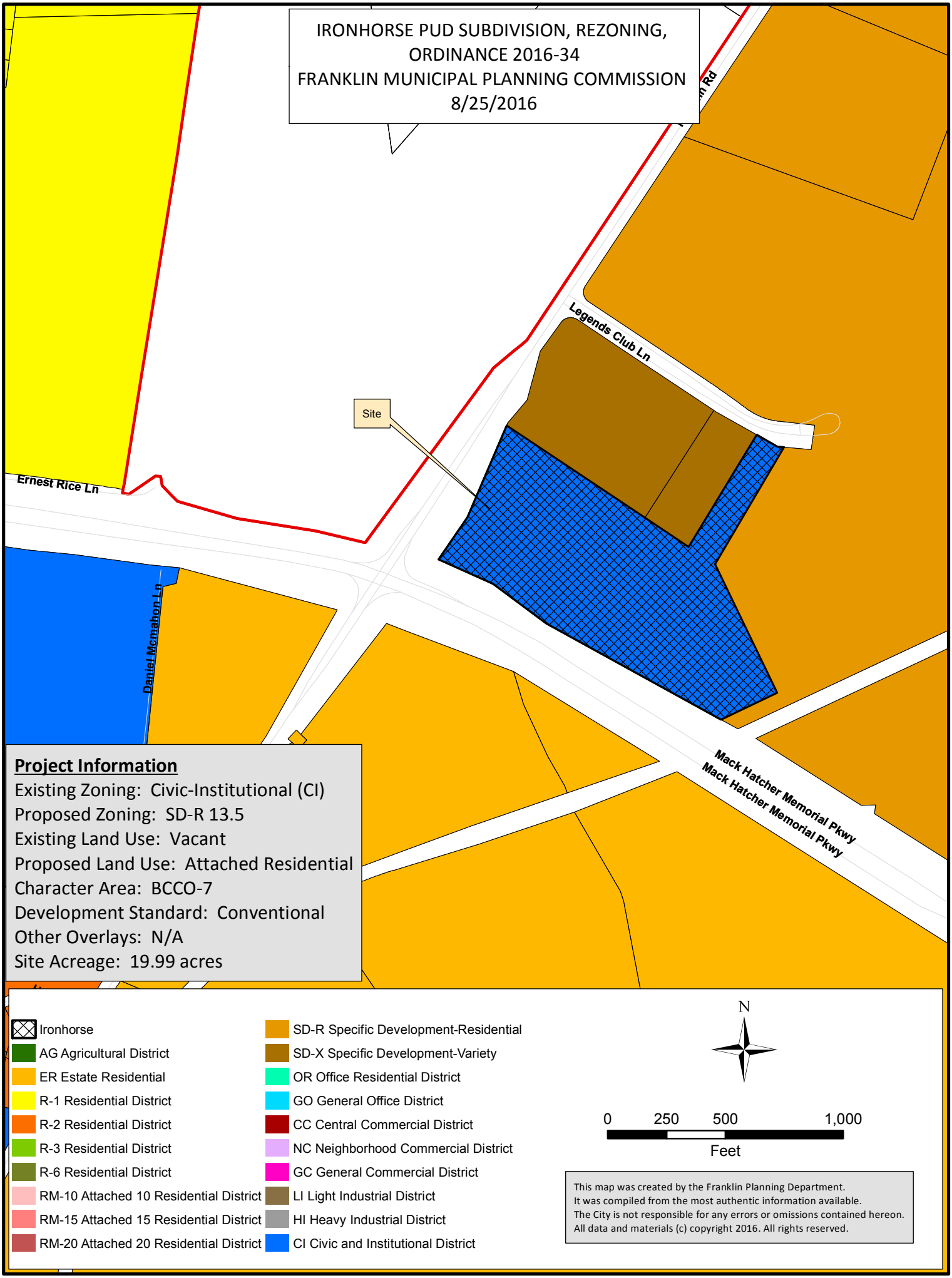
PASSED FIRST READING: _____

PUBLIC HEARING HELD: _____

PASSED SECOND READING: _____

PASSED THIRD READING: _____

Law Dept. approved 08.25.16


IRONHORSE PUD SUBDIVISION, REZONING,
ORDINANCE 2016-34
FRANKLIN MUNICIPAL PLANNING COMMISSION
8/25/2016
Site
Legends Club Ln
Ernest Rice Ln
Daniel Mcmahon Ln
Mack Hatcher Memorial Pkwy
Mack Hatcher Memorial Pkwy
Project Information
Existing Zoning: Civic-Institutional (CI)
Proposed Zoning: SD-R 13.5
Existing Land Use: Vacant
Proposed Land Use: Attached Residential
Character Area: BCCO-7
Development Standard: Conventional
Other Overlays: N/A
Site Acreage: 19.99 acres
Ironhorse
AG Agricultural District
ER Estate Residential
R-1 Residential District
R-2 Residential District
R-3 Residential District
R-6 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 2016-50

TO BE ENTITLED: "A RESOLUTION APPROVING A DEVELOPMENT PLAN FOR IRONHORSE PUD SUBDIVISION FOR THE PROPERTY LOCATED NORTH OF MACK HATCHER PARKWAY AND EAST OF FRANKLIN ROAD, 145 LEGENDS CLUB LANE."

WHEREAS, the Board of Mayor and Aldermen (BOMA) of the City of Franklin, Tennessee, has, or will, approve the zoning for the property as part of Ordinance 2016-34; 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; and

WHEREAS, in accordance with the provisions of *Tennessee Code Annotated* § 13-4-310, as amended, and subject to the exceptions set forth in said statute, the approval of the Development Plan by the BOMA will initiate a vesting period during which the development standards adopted by the City and in effect on the date of approval shall remain the standards applicable to the approved Development Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF MAYOR AND ALDERMEN 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
062---04300	19.99
Total	19.99

Law Dept. approved 08.19.16

Legal Description

Being a tract of land lying in the 8th District of Williamson County, Franklin, Tennessee. Tract being Lot 84 of Aspen Grove, Section V as recorded in Plat Book 13, Page 60, Register's Office of Williamson County, Tennessee (ROWC). Bounded on the west by the eastern Right-of Way (ROW) of U.S. Highway 31 (Franklin Road) and by Lot 1 of Aspen Grove PUD Subdivision as recorded in Plat Book 13, Page 21, ROWC, on the north by said Lot 1 of Aspen Grove PUD Subdivision and by the southern ROW of Legends Club Lane, on the east by Lot 93 of Aspen Grove, Section A as recorded in Plat Book 15, Page 52, ROWC, and on the south by the northern charter ROW of CSX Railroad and the northern ROW of Mack Hatcher Parkway. Tract being more particularly described as follows:

POINT OF BEGINNING being a concrete monument at the intersection of the northern ROW of said Mack Hatcher Parkway and the eastern ROW of said Franklin Road; thence with the eastern ROW of said Franklin Road, North 35°57'28" East 176.28 feet to an iron rod with RLS# 2039 cap; thence North 26°25'08" East 403.11 feet to a ½" iron rod; thence North 33°47'34" East 61.22 feet to a point; thence leaving the ROW of said Franklin Road with the common line of said Lot 1 of Aspen Grove PUD Subdivision, South 56°24'58" East 922.54 feet to a concrete monument; thence North 33°35'02" East 573.18 feet to an iron rod with RLS# 2039 cap; thence with the southern ROW of said Legends Club Lane along a curve to the left having a length of 104.41 feet, a radius of 630.00 feet, a central angle of 09°29'44", and having a chord bearing and distance of South 72°54'14" East 104.29 feet to a ½" iron rod; thence leaving said ROW of Legends Club Lane with the common line of said Lot 93 of Aspen Grove, Section A, South 33°35'02" West 602.78 feet to a fencepost; thence South 28°19'20" East 656.70 feet to a ½" iron rod; thence with the charter ROW of said CSX Railroad, South 64°31'29" West 83.17 feet to an iron rod with RLS# 2039 cap; thence with a curve to the left having a length of 198.12 feet, a radius of 6131.57 feet, a central angle of 01°51'05", and having a chord bearing and distance of South 65°27'36" West 198.11 feet to an iron rod with RLS# 2039 cap; thence leaving said charter ROW of CSX Railroad with the northern ROW of said Mack Hatcher Parkway, North 60°02'45" West 838.90 feet to a concrete monument; thence North 54°40'18" West 315.30 feet to a concrete monument; thence North 66°15'16" West 263.23 feet to the point of beginning.

Tract contains 870,808 square feet, or 19.99 acres.
Bearings based on Tennessee State Plane Coordinate System.

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

SECTION III. That the overall entitlements for the Ironhorse PUD Subdivision are as follows:

Entitlements	Ironhorse PUD Subdivision
Base Zone District	Specific Development Residential 13.2 District
Character Area Overlay	BCCO - 7
Development Standard	Conventional

Number of Dwelling Units	264
Open Space Requirements	43,562 square feet
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: __6/23/2016_____

BOMA/FMPC JOINT CONCEPTUAL WORKSHOP: __6/23/2016_____

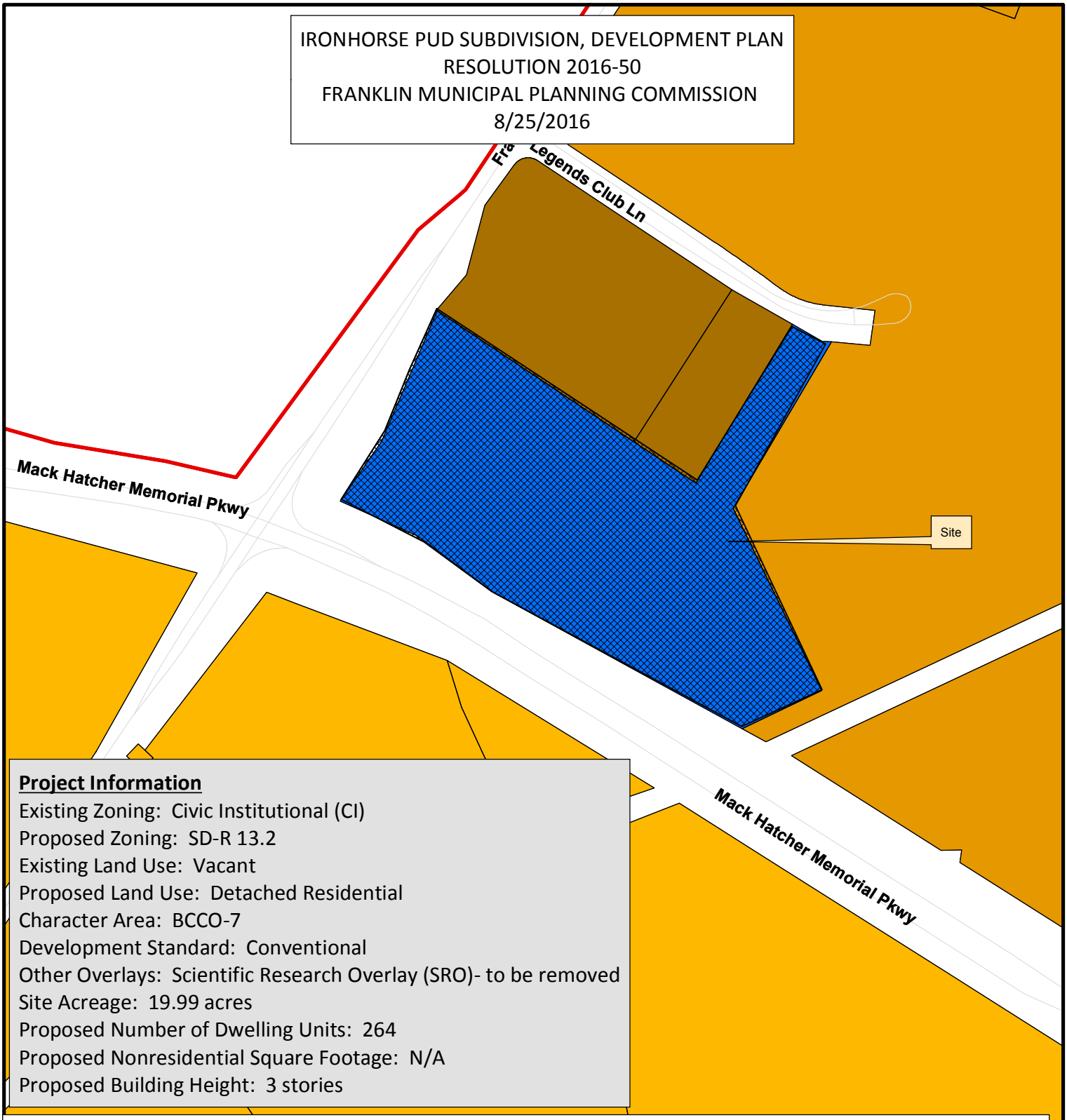
NEIGHBORHOOD MEETING: __6/22/2016_____

PLANNING COMMISSION RECOMMENDED APPROVAL: _____

PUBLIC HEARING AND BOMA APPROVAL: _____

Law Dept. approved 08.19.16

IRONHORSE PUD SUBDIVISION, DEVELOPMENT PLAN
RESOLUTION 2016-50
FRANKLIN MUNICIPAL PLANNING COMMISSION
8/25/2016



Project Information

Existing Zoning: Civic Institutional (CI)
Proposed Zoning: SD-R 13.2
Existing Land Use: Vacant
Proposed Land Use: Detached Residential
Character Area: BCCO-7
Development Standard: Conventional
Other Overlays: Scientific Research Overlay (SRO)- to be removed
Site Acreage: 19.99 acres
Proposed Number of Dwelling Units: 264
Proposed Nonresidential Square Footage: N/A
Proposed Building Height: 3 stories

- Ironhorse PUD Subdivision
- AG Agricultural District
- ER Estate Residential
- R-1 Residential District
- R-2 Residential District
- R-3 Residential District
- R-6 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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BUILDING DATA

UNIT	STORIES	NO OF BLDGS	BLDG FOOTPRINT	SF SUBTOTAL
CLUB/LEASING	1.5	1	7000	7000
BLDG A	3	1	11762	11762
BLDG B	3	2	13503	27006
BLDG C	2	3	5263	15789
BLDG D	2	4	5096	20384
BLDG E	3	1	16633	16633
BLDG F	3	2	19230	38460
			TOTAL BLDG SF	**137034**

SITE DATA

BUILDINGS	137,034
PAVEMENT	297,376
GREEN SPACE	436,834
TOTAL SF	**871,244**

STATEMENT OF IMPACTS

DRAINAGE
THE PROPERTY DRAINS TO THE SOUTHEAST AND FLOWS INTO THE SOUTH PRONG OF SPENCER CREEK.
IMPERVIOUS AREA FOLLOWING DEVELOPMENT WILL EQUAL 434,410 SF.
THERE WILL BE NO CHANGES IN OUTFALL AND STORMWATER WILL BE TREATED ON-SITE

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

POLICE AND FIRE
FRANKLIN FIRE DEPT. MALLORY STATION #3, 370 MALLORY STATION RD - 3.0 MILE,S DRIVING DISTANCE
FRANKLIN POLICE DEPT. STATION, 900 COLUMBIA AVE. - 2.3 MILES DRIVING DISTANCE

PROJECTED STUDENT POPULATION
THE STUDENT POPULATION IS PROJECTED AT A RATE OF ONE STUDENT PER .23 UNITS.
270 X .23 = 62 STUDENTS

JOHNSON ELEMENTARY, 1-4 GRADES	FRANKLIN	3.4 MILES
FREEDOM INTERMED & MID. SCHL, 5-8 GRADES	FRANKLN	3.7 MILES
FRANKLIN HIGH SCHOOL, 9-12 GRADES	FRANLIN	1.4 MILES

RECREATION FACILITIES
THE FACILITY WILL INCLUDE A SWIMMING POOL, OUTDOOR COURTYARDS, AND EXERCISE FACILITY FOR RESIDENTS. THE NEAREST CITY OF FRANKLIN PARK IS HARLINSDALE PARK .4 MILES FROM THE SITE.

REFUSE COLLECTION
REFUSE COLLECTION SERVICE WILL BE PROVIDED BY PRIVATE COLLECTION.

REPURIFIED (REUSE) WATER FACILITIES
REUSE WATER IS AVAILABLE FOR IRRIGATION. DURING A PEAK WEEK, IF THE ENTIRE SITE IS IRRIGATED THERE WILL BE A DEMAND OF "272,294 GALLONS PER WEEK."

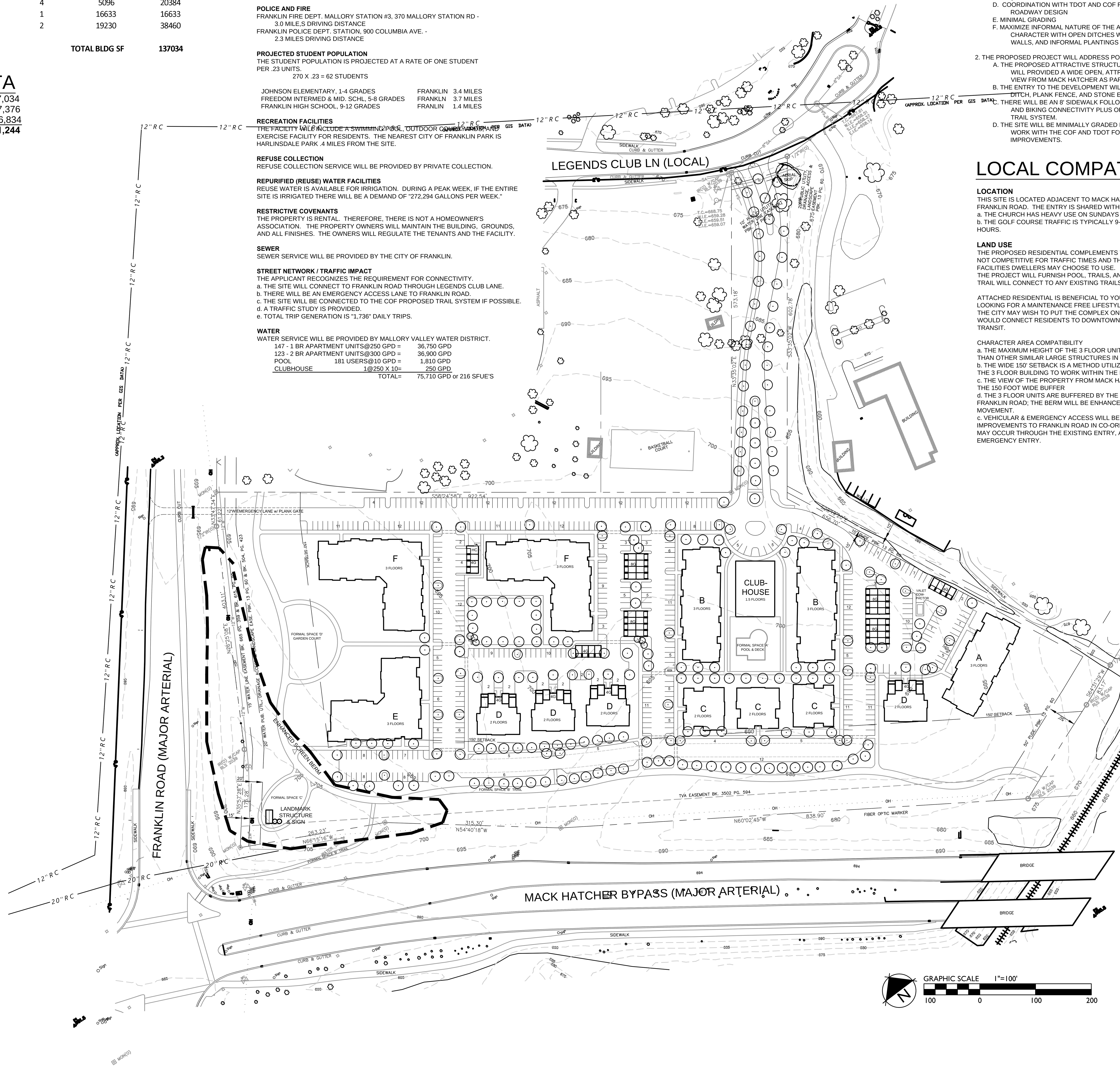
RESTRICTIVE COVENANTS
THE PROPERTY IS RENTAL. THEREFORE, THERE IS NOT A HOMEOWNER'S ASSOCIATION. THE PROPERTY OWNERS WILL MAINTAIN THE BUILDING, GROUNDS, AND ALL FINISHES. THE OWNERS WILL REGULATE THE TENANTS AND THE FACILITY.

SEWER
SEWER SERVICE WILL BE PROVIDED BY THE CITY OF FRANKLIN.

STREET NETWORK / TRAFFIC IMPACT
THE APPLICANT RECOGNIZES THE REQUIREMENT FOR CONNECTIVITY.
a. THE SITE WILL CONNECT TO FRANKLIN ROAD THROUGH LEGENDS CLUB LANE.
b. THERE WILL BE AN EMERGENCY ACCESS LANE TO FRANKLIN ROAD.
c. THE SITE WILL BE CONNECTED TO THE COF PROPOSED TRAIL SYSTEM IF POSSIBLE.
d. A TRAFFIC STUDY IS PROVIDED.
e. TOTAL TRIP GENERATION IS "1,736" DAILY TRIPS.

WATER
WATER SERVICE WILL BE PROVIDED BY MALLORY VALLEY WATER DISTRICT.

147 - 1 BR APARTMENT UNITS@250 GPD =		36,750 GPD
123 - 2 BR APARTMENT UNITS@300 GPD =		36,900 GPD
POOL	181 USERS@10 GPD =	1,810 GPD
CLUBHOUSE	1@250 X 10=	250 GPD
	TOTAL=	75,710 GPD or 216 SFUE'S



LAND USE COMPLIANCE

CHARACTER AREA OVERLAY: BCCO-7
APPLICABLE DEVELOPMENT STANDARD: CONVENTIONAL

1. THE FRANKLIN LAND USE PLAN IDENTIFIES THIS OVERLAY AREA AS:
   - A. GATEWAY TO CITY
   - B. RURAL IN HISTORY AND NATURE
   - C. DEVELOPMENT INCLUDING WIDE SETBACKS, GENEROUS OPEN SPACE, AND CLUSTERING OF ATTACHED RESIDENTIAL UNITS (COMMERCIAL USES SHALL NOT BE CONSIDERED)
   - D. COORDINATION WITH TDOT AND COF FOR CONTEXT SENSITIVE ROADWAY DESIGN
   - E. MINIMAL GRADING
   - F. MAXIMIZE INFORMAL NATURE OF THE AREA BY PROVIDING RURAL & SCENIC CHARACTER WITH OPEN DITCHES W/ OUT CURBS, FENCING & STONE WALLS, AND INFORMAL PLANTINGS NON-RIGID PLANTINGS.

2. THE PROPOSED PROJECT WILL ADDRESS POINTS A-F SUCCESSFULLY.
   - A. THE PROPOSED ATTRACTIVE STRUCTURES COMBINED WITH A 150' SETBACK WILL PROVIDED A WIDE OPEN, ATTRACTIVE SPACE AND AN ATTRACTIVE VIEW FROM MACK HATCHER AS PART OF GATEWAY TO CITY.
   - B. THE ENTRY TO THE DEVELOPMENT WILL BE RURAL IN NATURE WITH OPEN DITCH, PLANK FENCE, AND STONE ENTRY TREATMENT.
   - C. THERE WILL BE AN 8' SIDEWALK FOLLOWING THE ENTRY ROAD FOR WALKING AND BIKING CONNECTIVITY PLUS OPPORTUNITIES TO CONNECT TO A COF TRAIL SYSTEM.
   - D. THE SITE WILL BE MINIMALLY GRADED BY THE ENGINEERS WHO WILL ALSO WORK WITH THE COF AND TDOT FOR APPROPRIATE ROADWAY DESIGN IMPROVEMENTS.

LOCAL COMPATIBILITY

LOCATION
THIS SITE IS LOCATED ADJACENT TO MACK HATCHER PARKWAY WITH ACCESS ON FRANKLIN ROAD. THE ENTRY IS SHARED WITH THE CHURCH AND GOLF COURSE.
a. THE CHURCH HAS HEAVY USE ON SUNDAYS 8-12 AND WEDNESDAY EVENINGS 5-9.
b. THE GOLF COURSE TRAFFIC IS TYPICALLY 9-4 ANY DAY MISSING PEAK COMMUTING HOURS.

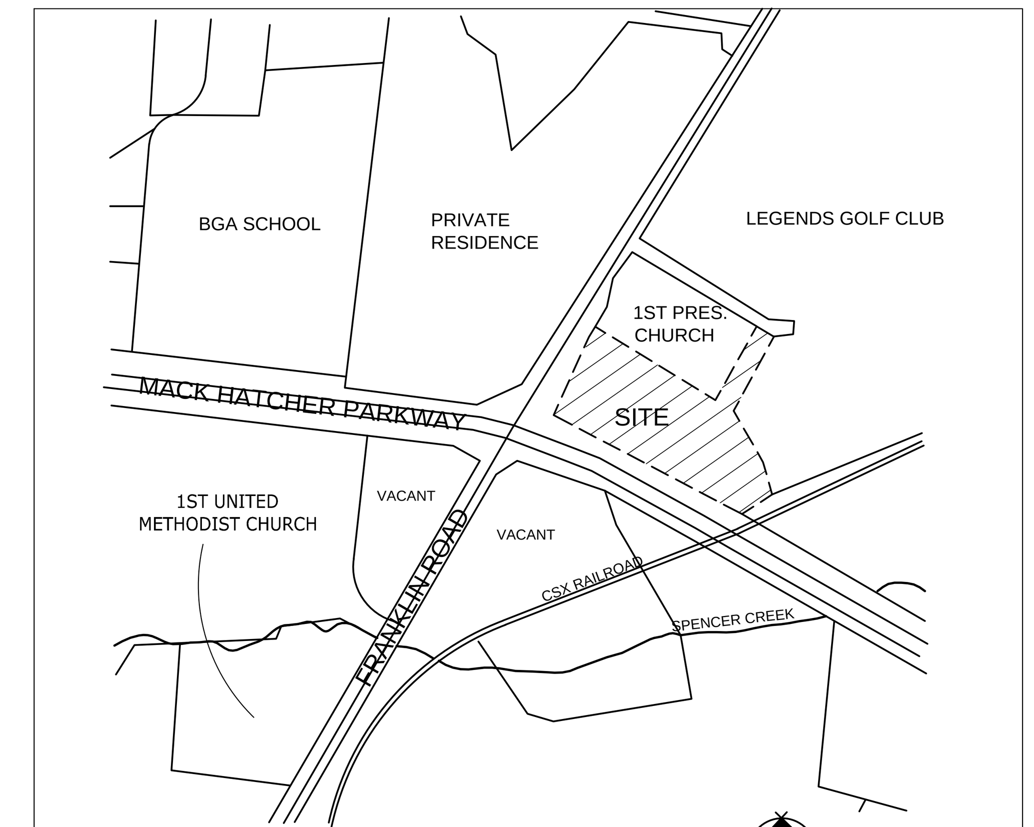
LAND USE
THE PROPOSED RESIDENTIAL COMPLEMENTS THE CHURCH AND GOLF COURSE. IT IS NOT COMPETITIVE FOR TRAFFIC TIMES AND THE GOLF CLUB AND CHURCH ARE FACILITIES DWELLERS MAY CHOOSE TO USE.
THE PROJECT WILL FURNISH POOL, TRAILS, AND CLUBHOUSE FOR RESIDENTS. THE TRAIL WILL CONNECT TO ANY EXISTING TRAILS THE CITY BUILDS.

ATTACHED RESIDENTIAL IS BENEFICIAL TO YOUNG PROFESSIONALS AND ADULTS LOOKING FOR A MAINTENANCE FREE LIFESTYLE AND SHORT COMMUTES TO WORK. THE CITY MAY WISH TO PUT THE COMPLEX ON ITS TROLLEY ROUTE. A TROLLEY STOP WOULD CONNECT RESIDENTS TO DOWNTOWN AND COOL SPRINGS VIA PUBLIC TRANSIT.

CHARACTER AREA COMPATIBILITY
a. THE MAXIMUM HEIGHT OF THE 3 FLOOR UNITS WILL BE EQUAL TO OR SHORTER THAN OTHER SIMILAR LARGE STRUCTURES IN THE CHARACTER AREA.
b. THE WIDE 150' SETBACK IS A METHOD UTILIZED TO MAKE A PROPER SETTING FOR THE 3 FLOOR BUILDING TO WORK WITHIN THE BERRYS CHAPEL CHARACTER AREA.
c. THE VIEW OF THE PROPERTY FROM MACK HATCHER IS PRESERVED BY PROVIDING THE 150 FOOT WIDE BUFFER
d. THE 3 FLOOR UNITS ARE BUFFERED BY THE EXISTING BERM AT MACK HATCHER AND FRANKLIN ROAD; THE BERM WILL BE ENHANCED WITH PLANTING AND EARTH MOVEMENT.
c. VEHICULAR & EMERGENCY ACCESS WILL BE ASSISTED BY ROADWAY IMPROVEMENTS TO FRANKLIN ROAD IN CO-ORDINATION WITH COF AND TDOT. THIS MAY OCCUR THROUGH THE EXISTING ENTRY, AN ADDITIONAL ENTRY, OR AN EMERGENCY ENTRY.

SURVEY INFORMATION
1. PROPERTY BOUNDARY LINE SURVEY PERFORMED BY LEADING AGE LAND SERVICES, 2005.

2. PLANS REFERENCE THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FIPSZONE 4100; NAD 83 DATUM.



VICINITY MAP

SITE DATA CHART

PROJECT NAME:	IRON HORSE
PROJECT NUMBER:	6194
SUBDIVISION:	ASPEN GROVE PUD SUBDIVISION SECTION 5
LOT NUMBER:	84
ADDRESS:	145 LEGENDS CLUB LANE
CITY:	FRANKLIN, TN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 62 PARCEL 43
EXISTING ZONING:	CIVIC & INSTITUTIONAL (CI)
PROPOSED ZONING:	SD-X 13.5
CHARACTER AREA OVERLAY:	BCCO-7
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
TOTAL AC:	20.001 AC
TOTAL SF:	871,243.56 SF
BUILDING SETBACKS:	FRONT SOUTH & WEST 150' SIDE 10 REAR 25

OWNER:
TIMOTHY P. VACEK, CFA
IRON HORSE PARK, LLC
138 2ND AVENUE NORTH
NASHVILLE, TN 37201
615.620.5988
EMAIL rvacek@1stpartners.com

PLANNER/LANDSCAPE ARCHITECT:
GREG GAMBLE
144 SOUTHEAST PARKWAY, SUITE 200
FRANKLIN, TN 37064
615.975.5765
GREG GAMBLE
greggamble209@gmail.com

BUILDING FOOTPRINT SQUARE FOOTAGE:	139,027
BUILDING UNITS:	270 TOTAL 147 ONE-BEDROOM UNITS 123 TWO-BEDROOM UNITS
RESIDENTIAL DENSITY PROPOSED:	13.2 DUA
BUILDING PRELIMINARY HEIGHT:	BLDG A-B-E-F 3 STORY 50' BLDG C-D 2 STORY 40' CLUBHOUSE 1 STORY 35'
LANDSCAPE SURFACE RATIO:	.50
MINIMUM LANDSCAPE SURFACE RATIO:	.40
MINIMUM PARKING REQUIREMENT:	1.5 PER 1 BEDROOM 2.5 PER 2 BEDROOM 147 (1 BR) x 1.5 SPACES = 221 123 (2 BR) x 2.5 SPACES = 308 TOTAL SPACES REQUIRED: 529
MAXIMUM PARKING LIMIT (10%):	582
EXISTING PARKING:	N/A
PARKING PROVIDED:	537 TOTAL SPACES 477 SURFACE SPACES 60 GARAGE SPACES
PARKLAND (IF APPLICABLE):	FEE IN LIEU
OPEN SPACE AREAS	
OPEN SPACE REQUIREMENT	43,562 SF = 5% x 871, 244 SF TOTAL SITE AREA
FORMAL:	100% OF TOTAL SET ASIDE
FORMAL PROVIDED: 48,068 SF	A. POOL 9,811 B. TRAIL 19,100 C. LANDMARK 6,925 D. GARDEN 12,232
INFORMAL:	NONE REQUIRED

SITE DESIGN NOTES

1. THERE IS NOT A HOUSE OR BUILDING ON THE NATIONAL HISTORIC REGISTER NEAR OR WITHIN 500' OF THE DEVELOPING PROPERTY.

2. THE BUILDINGS WILL BE SPRINKLED.

3. BASED ON GRAPHIC PLOTTING OF FEMA FIRM MAPS, IT HAS BEEN DETERMINED THAT THE PARCEL DOES NOT LIE WITHIN A FLOOD HAZARD ZONE.

4. NO SLOPES GREATER THAN 14% EXIST ON THE PROPERTY .

5. THERE IS NOT A TREE CANOPY ON THIS SITE.

6. PARKLAND DEDICATION:
   270 TOTAL DWELLINGS
   35 UNITS x 1,200 SF = 42,000 SF
   235 UNITS x 600 SF = 141,400 SF
   183,400 SF / 4.21 ACRES

   PARKLAND DEDICATION WILL BE GREENWAY TRAIL AREA ALONG MACK HATCHER & FRANKLIN ROAD. EXACT LOCATION OF EASEMENT AND TRAIL SHALL BE COORDINATED WITH THE COF PARKS DEPARTMENT AT SITE PLAN STAGE.

7.11.2016 8.4.2016

Revisions:
December [illegible] 2015

Drawing Notes:

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

Date: JULY 11, 2016

IRON HORSE DEVELOPMENT PLAN

145 LEGENDS CLUB LANE
Franklin, Williamson County, Tennessee

GREGORY C. GAMBLE
LANDSCAPE ARCHITECT
8.4.16

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
SUITE 230
FRANKLIN, TENNESSEE 37064
GREG GAMBLE
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OVERALL DEVELOPMENT PLAN

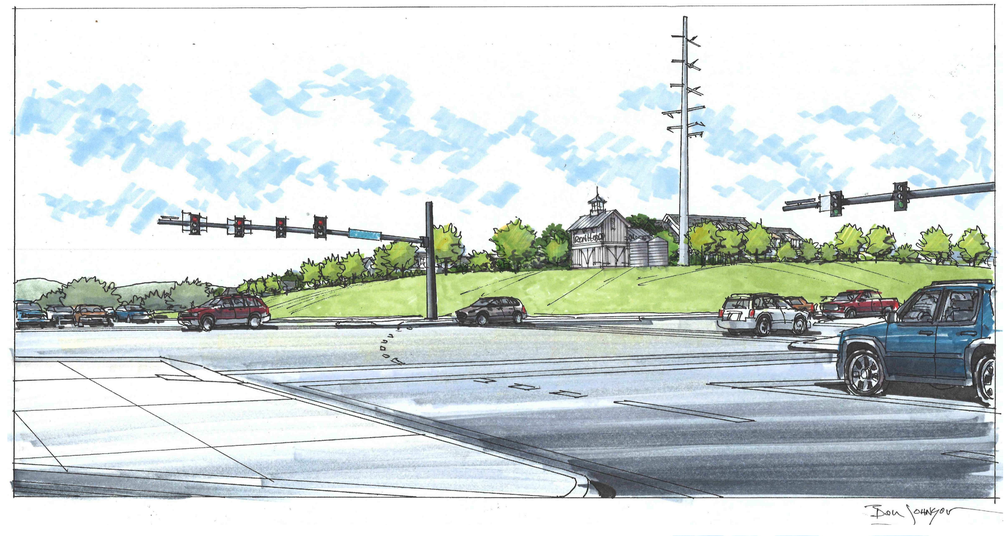
C2.0

COF 6194

ARCHITECTURAL ELEVATION
VIEW FROM MACK HATCHER BYPASS TO COMPLEX DRIVING WEST

ARCHITECTURAL ELEVATION
VIEW FROM FRANKLIN ROAD TO WESTERN DEVELOPMENT EDGE

ARCHITECTURAL ELEVATION
VIEW OF TYPICAL GARAGES



ARCHITECTURAL ELEVATION
VIEW FROM MACK HATCHER BYPASSS AT FRANKLIN ROAD
NOTE STRUCTURE IN FOREGROUND

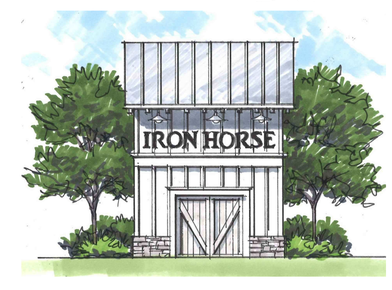
ARCHITECTURAL DESIGN INTENT

THE DEVELOPMENT WILL FEATURE A SMALL SHED-LIKE *LANDMARK STRUCTURE* AT THE CORNER OF MACK HATCHER AND FRANKLIN ROAD. THE BUILDING WILL BE CONSTRUCTED IN AN IONIC RURAL STYLE REMINISCENT OF NEARBY FARM STRUCTURES FOUND IN WILLIAMSON COUNTY.

THE BUILDING WILL BECOME A LANDMARK IDENTIFYING THE DEVELOPMENT ACROSS THE COMMUNITY.

SIGNAGE ON THE SHED WILL FOLLOW THESE GUIDELINES:
a) LESS THAN 32 SF (NOT A BILLBOARD)
b) ATTACHED TO THE LANDMARK BUILDING, &
c) LOCATED BELOW THE BUILDING ROOF LINE.

TWO GRAIN BINS CONTAINING "CISTERNS" WILL BE LOCATED ADJACENT TO THE STRUCTURE. THEY WILL BE FITTED TO STORE RAINWATER FOR IRRIGATION. THE CYLINDRICAL STRUCTURES WILL RE-INFORCE THE FARMSTEAD DESIGN STYLE OF THE DEVELOPMENT PROJECT.



7.11.2016 8.4.2016

Revisions:
Del&m□r □ 2015

Drawing Notes:

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

Date: JULY 11, 2016

IRON HORSE
DEVELOPMENT PLAN
145 LEGENDS CLUB LANE
Franklin, Williamson County, Tennessee

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
SUITE 230
FRANKLIN, TENNESSEE 37064
GREG GAMBLE
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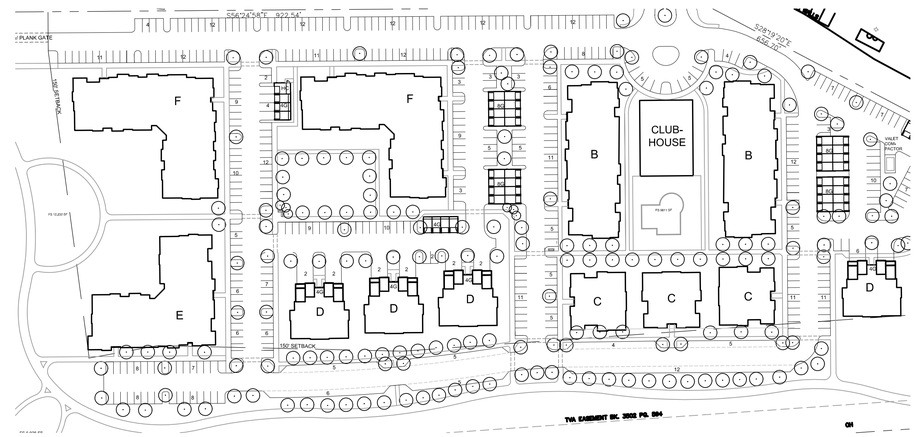
615.975.5765

ARCHITECTURAL VIEWS

A1.1

COF 6194

ARCHITECTURAL ELEVATION
TYPE 'A' BUILDING FACADE



ARCHITECTURAL ELEVATION
TYPE 'E' BUILDING FACADE FACING
MACK HATCHER PARKWAY

ARCHITECTURAL DATA:

BUILDING HEIGHT: 3 STORIES

THE ARCHITECTURE FOR IRON HORSE WILL BE "BIG HOUSE" STYLE BUILDINGS. A BIG HOUSE BUILDING HAS MULTIPLE RESIDENTIAL UNITS UNDER ONE ROOF, BUT IS DESIGNED SIMILAR TO A LARGE MANSION. EACH BUILDING IS PLANNED TO HAVE A UNIQUE DESIGN, BUT COMPATIBLE WITH THE OTHER BUILDINGS.

THE PROPOSED ARCHITECTURAL STYLE WILL HAVE A RURAL, FARM-STYLE VERNACULAR, WITH EXTERIOR BUILDING MATERIALS OF STONE, BOARD SIDING, AND NEUTRAL COLORS.

THE CLUBHOUSE IS LOCATED ON ON AXIS WITH THE MAIN ENTRY FROM LEGENDS CLUB LANE AND WILL OFFER AMENITIES INCLUDING A POOL, FITNESS FACILITIES, AND A BUSINESS CENTER.

MATERIALS LIST:

STONE VENEER
FIBER CEMENT SIDING

ARCHITECTURAL ELEVATION
TYPE 'E' BUILDING FACADE
FACING FRANKLIN ROAD

ARCHITECTURAL ELEVATIONS
TYPE 'C' & 'D' BUILDING FRONTAGES

7.11.2016 8.4.2016

Revisions:
December 2015

Drawing Notes:

GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE
Date: JULY 2016

IRON HORSE DEVELOPMENT PLAN
145 LEGENDS CLUB LANE
Franklin, Williamson County, Tennessee

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

ARCHITECTURAL ELEVATIONS

A1.0

COF 6194

IRON HORSE DEVELOPMENT PLAN

ASPEN GROVE PUD SUBDIVISION, SECTION 5, LOT 84

TAX MAP 62, PARCEL 43

OWNER
IRON HORSE PARK, LLC
138 2ND AVE. NORTH
NASHVILLE, TN 37201
TIMOTHY P. VACEK, CFA
rvacek@1stpartners.com
615.620.5988

DEVELOPER
EMBREY INVESTMENTS
1020 NE LOOP 410, SUITE 700
SAN ANTONIO, TX 78209
CONTACT: BRAD KNOLLE,
SENIOR VICE-PRESIDENT DEVELOPMENT
bknolle@embreydc.com
210.804.5231 C 210.268.8620

APPLICANT
GAMBLE DESIGN COLLABORATIVE, LLC
144 SOUTHEAST PARKWAY, SUITE 200
FRANKLIN TN 37064
CONTACT: GREG GAMBLE, RLA
greggamble209@gmail.com
615.975.5765

CIVIL ENGINEER / SURVEYOR
LITTLEJOHN - S&ME CO.
1935 21st AVE. SOUTH
NASHVILLE, TN 37212
CONTACT: ANDREW WOLTHERS, PE
SENIOR PROJECT MANAGER
awolthers@leainc.com
615.324.3962

ARCHITECT
BGO ARCHITECTS
4202 BELTWAY DRIVE
ADDISON, TX 75001
DARREN DOBBINS, PROJECT ARCHITECT
ddobbins@bgoarchitects.com
241.520.8878

VICINITY MAP

CITY OF FRANKLIN, WILLIAMSON COUNTY, TENNESSEE

SHEET INDEX

C 0.0	COVER SHEET
C 1.0	OVERALL EXISTING CONDITIONS
C 2.0	OVERALL DEVELOPMENT PLAN
C 3.0	OVERALL SITE GRADING
C 4.0	OVERALL ROW & ACCESS PLAN
C 5.0	OVERALL SITE UTILITIES
A1.0	ARCHITECTURAL ELEVATIONS
A1.1	ARCHITECTURAL ELEVATIONS

DEVELOPMENT NOTES

1. THE DEVELOPER WILL MAKE A PARKLAND DEDICATION CONTRIBUTION WHICH WILL INCLUDE A GREENWAY TRAIL EASEMENT ALONG BOTH FRANKLIN ROAD AND MACK HATCHER PARKWAY. THIS ACTION WILL BE CO-ORDINATED WITH COF PARKS AND RECREATION DEPARTMENT AT SITE PLAN.

2. THE PROJECT IS BEING RE-ZONED FROM CI TO SD-X 13.5.

3. MODIFICATION OF STANDARD REQUIRED FOR BUILDING "B" AS OVER 200' LONG. PROFILE OF BUILDING TYPE HAS BEEN VARIED. MAXIMUM BUILDING LENGTH 215'.

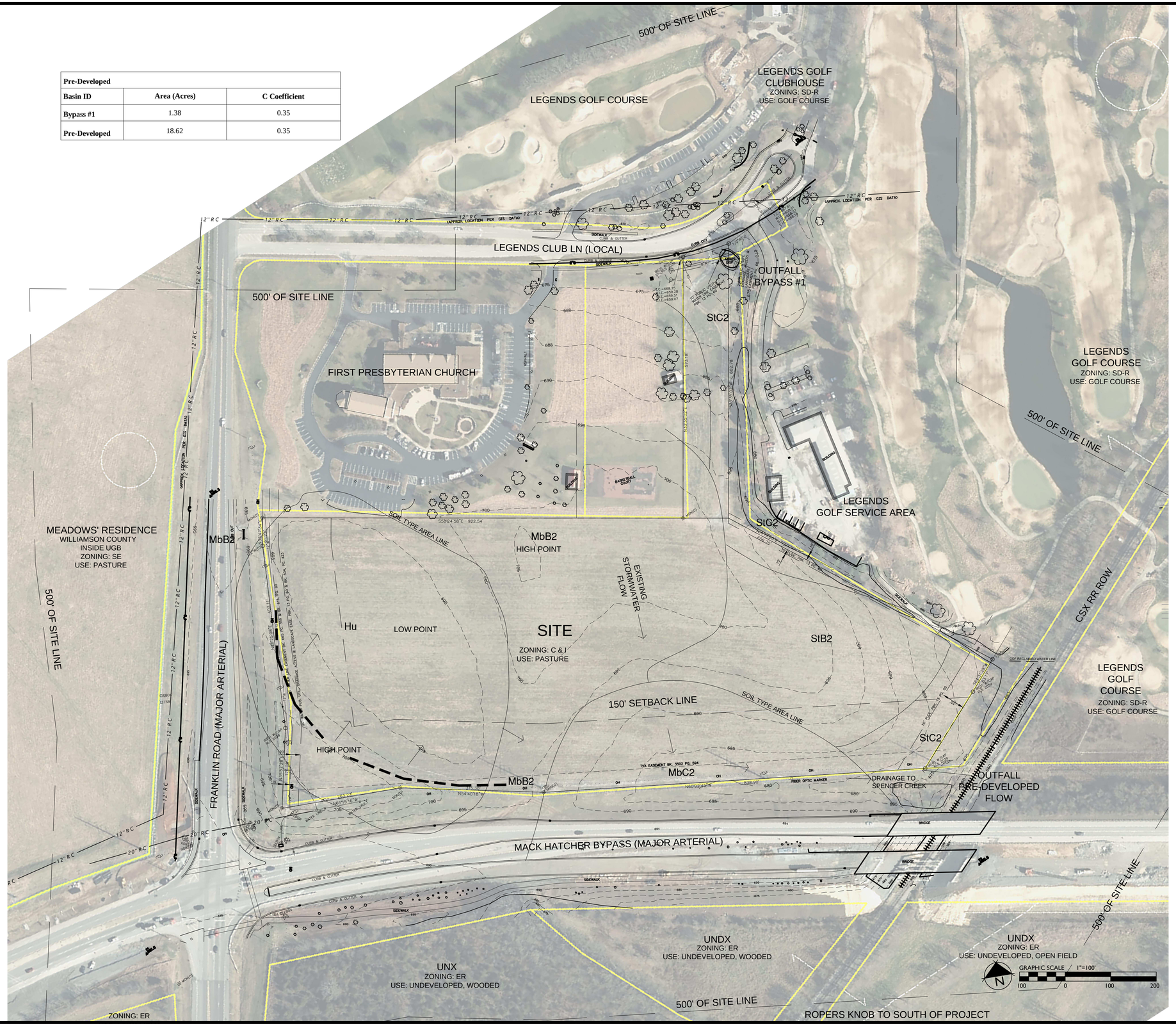
GDC
GAMBLE
DESIGN COLLABORATIVE

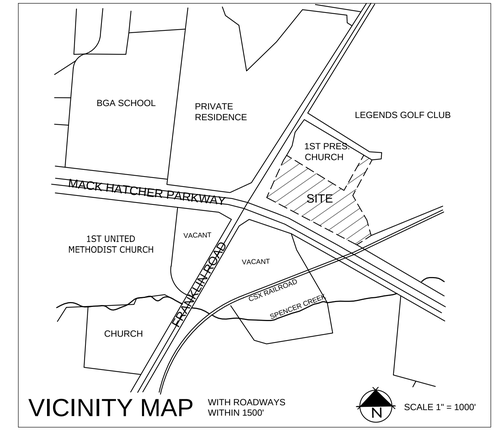
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE
greggamble209@gmail.com

JULY 11, 2016
AUGUST 4, 2016

COF # 6194

Pre-Developed		
Basin ID	**Area (Acres)**	**C Coefficient**
Bypass #1	1.38	0.35
Pre-Developed	18.62	0.35





SITE DATA CHART

PROJECT NAME:	IRON HORSE
PROJECT NUMBER:	XXXX
SUBDIVISION:	ASPEN GROVE PUD SUBDIVISION SECTION 5
LOT NUMBER:	84
ADDRESS:	145 LEGENDS CLUB LANE
CITY:	FRANKLIN, TN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 62 PARCEL 43
EXISTING ZONING:	CIVIC & INSTITUTIONAL (CI)
PROPOSED ZONING:	SD-X 13.5
CHARACTER AREA OVERLAY:	BCCO-7
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
TOTAL AC:	20.001 AC
TOTAL SF:	871,243.56 SF
BUILDING SETBACKS:	FRONT SOUTH & WEST 150' SIDE 10 REAR 25

OWNER:
TIMOTHY P. VACEK, CFA
IRON HORSE PARK, LLC
138 2ND AVENUE NORTH
NASHVILLE, TN 37201
615.620.5988
rvacek@1stpartners.com

PLANNER/LANDSCAPE ARCHITECT:
GREG GAMBLE
144 SOUTHEAST PARKWAY, SUITE 200
FRANKLIN, TN 37064
615.975.5765
GREG GAMBLE
greggamble209@gmail.com

BUILDING SQUARE FOOTAGE:	253,434
BUILDING UNITS:	264 TOTAL 145 ONE-BEDROOM UNITS 119 TWO-BEDROOM UNITS
RESIDENTIAL DENSITY PROPOSED:	13.2 DUA
BUILDING HEIGHT MAXIMUM:	BLDG A-B-E-F-G 3 STORY 50' BLDG A-C-D 2 STORY 40' CLUBHOUSE 1 STORY 35'
LANDSCAPE SURFACE RATIO:	.-
MINIMUM LANDSCAPE SURFACE RATIO:	.40
MINIMUM PARKING REQUIREMENT:	1.5 PER 1 BEDROOM 2.5 PER 2 BEDROOM 148 (1 BR) x 1.5 SPACES = 222 121 (2 BR) x 2.5 SPACES = 303 TOTAL SPACES REQUIRED: 525
MAXIMUM PARKING LIMIT (10%):	578
EXISTING PARKING:	N/A
PARKING PROVIDED:	537 TOTAL SPACES 477 SURFACE SPACES 60 GARAGE SPACES
TREE CANOPY EXISTING:	NONE
PARKLAND (IF APPLICABLE):	GREENWAY TRAIL AREA TO BE DEDICATED TO COF TOTAL AREA 4.19 ACRES BASED ON NUMBER OF UNITS

SITE DESIGN NOTES

1. THERE IS NOT A HOUSE OR BUILDING ON THE NATIONAL HISTORIC REGISTER NEAR OR WITHIN 500' OF THE DEVELOPING PROPERTY. ROPERS KNOB IS SOUTH OF THE PROJECT OVERLOOKING THE AREA.

2. THE BUILDINGS WILL BE SPRINKLED.

3. BASED ON GRAPHIC PLOTTING OF FEMA FIRM MAPS, IT HAS BEEN DETERMINED THAT THE PARCEL DOES NOT LIE WITHIN A FLOOD HAZARD ZONE.

4. NO SLOPES GREATER THAN 14% EXIST ON THE PROPERTY.

5. THERE ARE NO TREE CANOPIES ON THIS SITE; THE SITE IS A GRASSY FIELD.

SOIL TYPES KEY

Hu	HUNTINGTON SILT LOAM, PHOSPHATIC
MbB2	MAURY SILT LOAM, 2-5% SLOPES
MbC2	MAURY SILT LOAM, 5-12% SLOPES
StB2	STIVERSVILLE SILT LOAM, 2-5% SLOPES
StC2	STIVERSVILLE SILT LOAM, 5-12% SLOPER

SURVEY INFORMATION
1. PROPERTY BOUNDARY LINE SURVEY AND TOPOGRAPHIC MAPPING PERFORMED BY LEADING AGE LAND SERVICES, 2005.

2. PLANS REFERENCE THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FIPSZONE 4100; NAD 83 DATUM.

7.11.2016 8.4.2016

Revisions:

Drawing Notes:

GDC
GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

Date: JULY 11, 2016

IRON HORSE DEVELOPMENT PLAN
145 LEGENDS CLUB LANE
Franklin, Williamson County, Tennessee

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

OVERALL EXISTING CONDITIONS PLAN

C1.0

COF 6194

BUILDING DATA

UNIT	STORIES	NO OF BLDGS	BLDG FOOTPRINT	SF SUBTOTAL
CLUB/LEASING	1.5	1	7000	7000
BLDG A	3	1	11762	11762
BLDG B	3	2	13503	27006
BLDG C	2	3	5263	15789
BLDG D	2	4	5096	20384
BLDG E	3	1	16633	16633
BLDG F	3	2	19230	38460
			TOTAL BLDG SF	**137034**

SITE DATA

BUILDINGS	137,034
PAVEMENT	297,376
GREEN SPACE	436,834
TOTAL SF	**871,244**

STATEMENT OF IMPACTS

DRAINAGE
THE PROPERTY DRAINS TO THE SOUTHEAST AND FLOWS INTO THE SOUTH PRONG OF SPENCER CREEK.
IMPERVIOUS AREA FOLLOWING DEVELOPMENT WILL EQUAL 434,410 SF.
THERE WILL BE NO CHANGES IN OUTFALL AND STORMWATER WILL BE TREATED ON-SITE

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

POLICE AND FIRE
FRANKLIN FIRE DEPT. MALLORY STATION #3, 370 MALLORY STATION RD - 3.0 MILE,S DRIVING DISTANCE
FRANKLIN POLICE DEPT. STATION, 900 COLUMBIA AVE. - 2.3 MILES DRIVING DISTANCE

PROJECTED STUDENT POPULATION
THE STUDENT POPULATION IS PROJECTED AT A RATE OF ONE STUDENT PER .23 UNITS.
270 X .23 = 62 STUDENTS

JOHNSON ELEMENTARY, 1-4 GRADES	FRANKLIN	3.4 MILES
FREEDOM INTERMED & MID. SCHL, 5-8 GRADES	FRANKLN	3.7 MILES
FRANKLIN HIGH SCHOOL, 9-12 GRADES	FRANLIN	1.4 MILES

RECREATION FACILITIES
THE FACILITY WILL INCLUDE A SWIMMING POOL, OUTDOOR COURTYARDS, AND EXERCISE FACILITY FOR RESIDENTS. THE NEAREST CITY OF FRANKLIN PARK IS HARLINSDALE PARK .4 MILES FROM THE SITE.

REFUSE COLLECTION
REFUSE COLLECTION SERVICE WILL BE PROVIDED BY PRIVATE COLLECTION.

REPURIFIED (REUSE) WATER FACILITIES
REUSE WATER IS AVAILABLE FOR IRRIGATION. DURING A PEAK WEEK, IF THE ENTIRE SITE IS IRRIGATED THERE WILL BE A DEMAND OF "272,294 GALLONS PER WEEK."

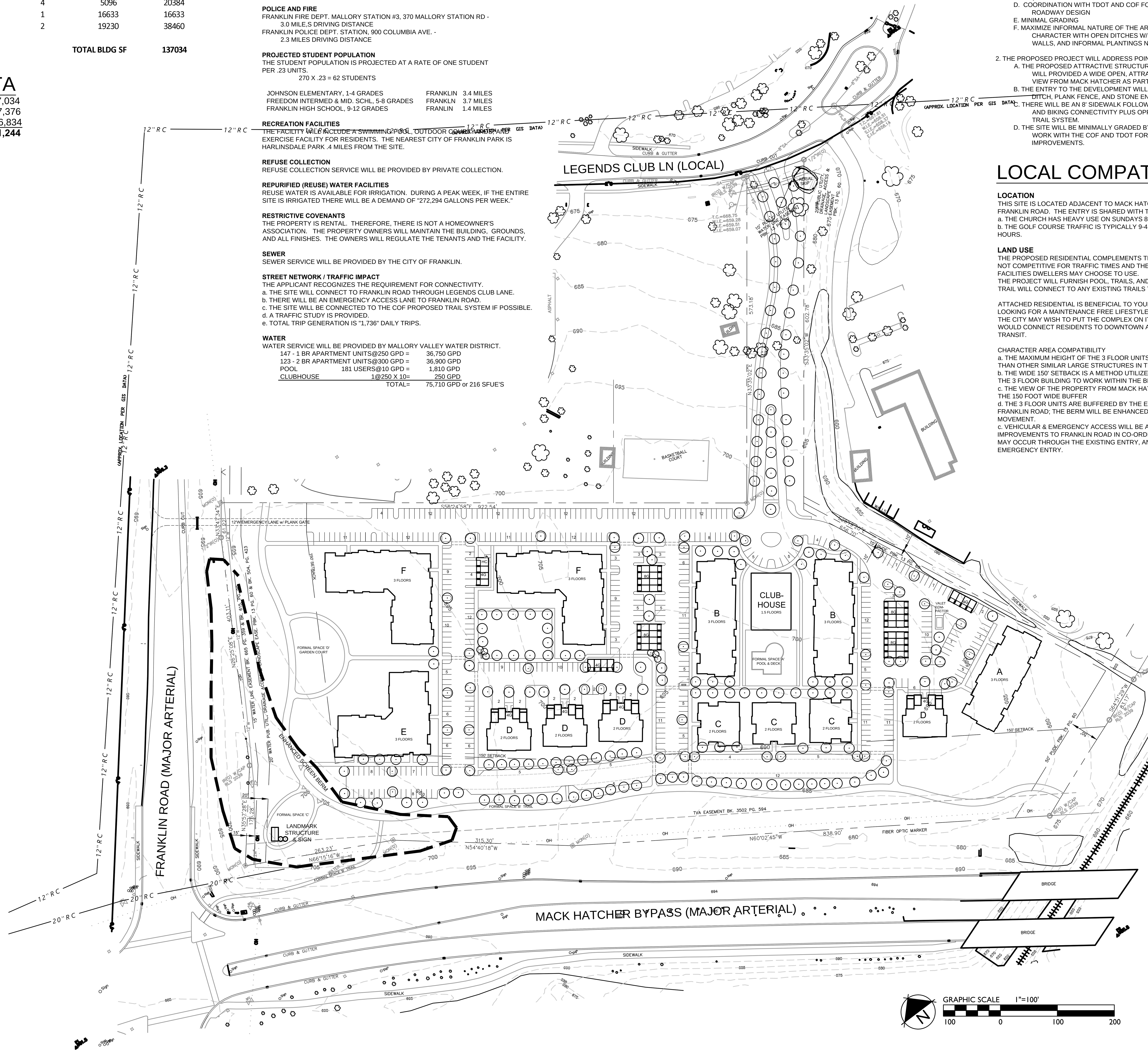
RESTRICTIVE COVENANTS
THE PROPERTY IS RENTAL. THEREFORE, THERE IS NOT A HOMEOWNER'S ASSOCIATION. THE PROPERTY OWNERS WILL MAINTAIN THE BUILDING, GROUNDS, AND ALL FINISHES. THE OWNERS WILL REGULATE THE TENANTS AND THE FACILITY.

SEWER
SEWER SERVICE WILL BE PROVIDED BY THE CITY OF FRANKLIN.

STREET NETWORK / TRAFFIC IMPACT
THE APPLICANT RECOGNIZES THE REQUIREMENT FOR CONNECTIVITY.
a. THE SITE WILL CONNECT TO FRANKLIN ROAD THROUGH LEGENDS CLUB LANE.
b. THERE WILL BE AN EMERGENCY ACCESS LANE TO FRANKLIN ROAD.
c. THE SITE WILL BE CONNECTED TO THE COF PROPOSED TRAIL SYSTEM IF POSSIBLE.
d. A TRAFFIC STUDY IS PROVIDED.
e. TOTAL TRIP GENERATION IS "1,736" DAILY TRIPS.

WATER
WATER SERVICE WILL BE PROVIDED BY MALLORY VALLEY WATER DISTRICT.

147 - 1 BR APARTMENT UNITS@250 GPD =		36,750 GPD
123 - 2 BR APARTMENT UNITS@300 GPD =		36,900 GPD
POOL	181 USERS@10 GPD =	1,810 GPD
CLUBHOUSE	1@250 X 10=	250 GPD
	TOTAL=	75,710 GPD or 216 SFUE'S



LAND USE COMPLIANCE

CHARACTER AREA OVERLAY:	BCCO-7
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL

1. THE FRANKLIN LAND USE PLAN IDENTIFIES THIS OVERLAY AREA AS:
   A. GATEWAY TO CITY
   B. RURAL IN HISTORY AND NATURE
   C. DEVELOPMENT INCLUDING WIDE SETBACKS, GENEROUS OPEN SPACE, AND CLUSTERING OF ATTACHED RESIDENTIAL UNITS (COMMERCIAL USES SHALL NOT BE CONSIDERED)
   D. COORDINATION WITH TDOT AND COF FOR CONTEXT SENSITIVE ROADWAY DESIGN
   E. MINIMAL GRADING
   F. MAXIMIZE INFORMAL NATURE OF THE AREA BY PROVIDING RURAL & SCENIC CHARACTER WITH OPEN DITCHES W/ OUT CURBS, FENCING & STONE WALLS, AND INFORMAL PLANTINGS NON-RIGID PLANTINGS.

2. THE PROPOSED PROJECT WILL ADDRESS POINTS A-F SUCCESSFULLY.
   A. THE PROPOSED ATTRACTIVE STRUCTURES COMBINED WITH A 150' SETBACK WILL PROVIDED A WIDE OPEN, ATTRACTIVE SPACE AND AN ATTRACTIVE VIEW FROM MACK HATCHER AS PART OF GATEWAY TO CITY.
   B. THE ENTRY TO THE DEVELOPMENT WILL BE RURAL IN NATURE WITH OPEN DITCH, PLANK FENCE, AND STONE ENTRY TREATMENT.
   C. THERE WILL BE AN 8' SIDEWALK FOLLOWING THE ENTRY ROAD FOR WALKING AND BIKING CONNECTIVITY PLUS OPPORTUNITIES TO CONNECT TO A COF TRAIL SYSTEM.
   D. THE SITE WILL BE MINIMALLY GRADED BY THE ENGINEERS WHO WILL ALSO WORK WITH THE COF AND TDOT FOR APPROPRIATE ROADWAY DESIGN IMPROVEMENTS.

LOCAL COMPATIBILITY

LOCATION
THIS SITE IS LOCATED ADJACENT TO MACK HATCHER PARKWAY WITH ACCESS ON FRANKLIN ROAD. THE ENTRY IS SHARED WITH THE CHURCH AND GOLF COURSE.
a. THE CHURCH HAS HEAVY USE ON SUNDAYS 8-12 AND WEDNESDAY EVENINGS 5-9.
b. THE GOLF COURSE TRAFFIC IS TYPICALLY 9-4 ANY DAY MISSING PEAK COMMUTING HOURS.

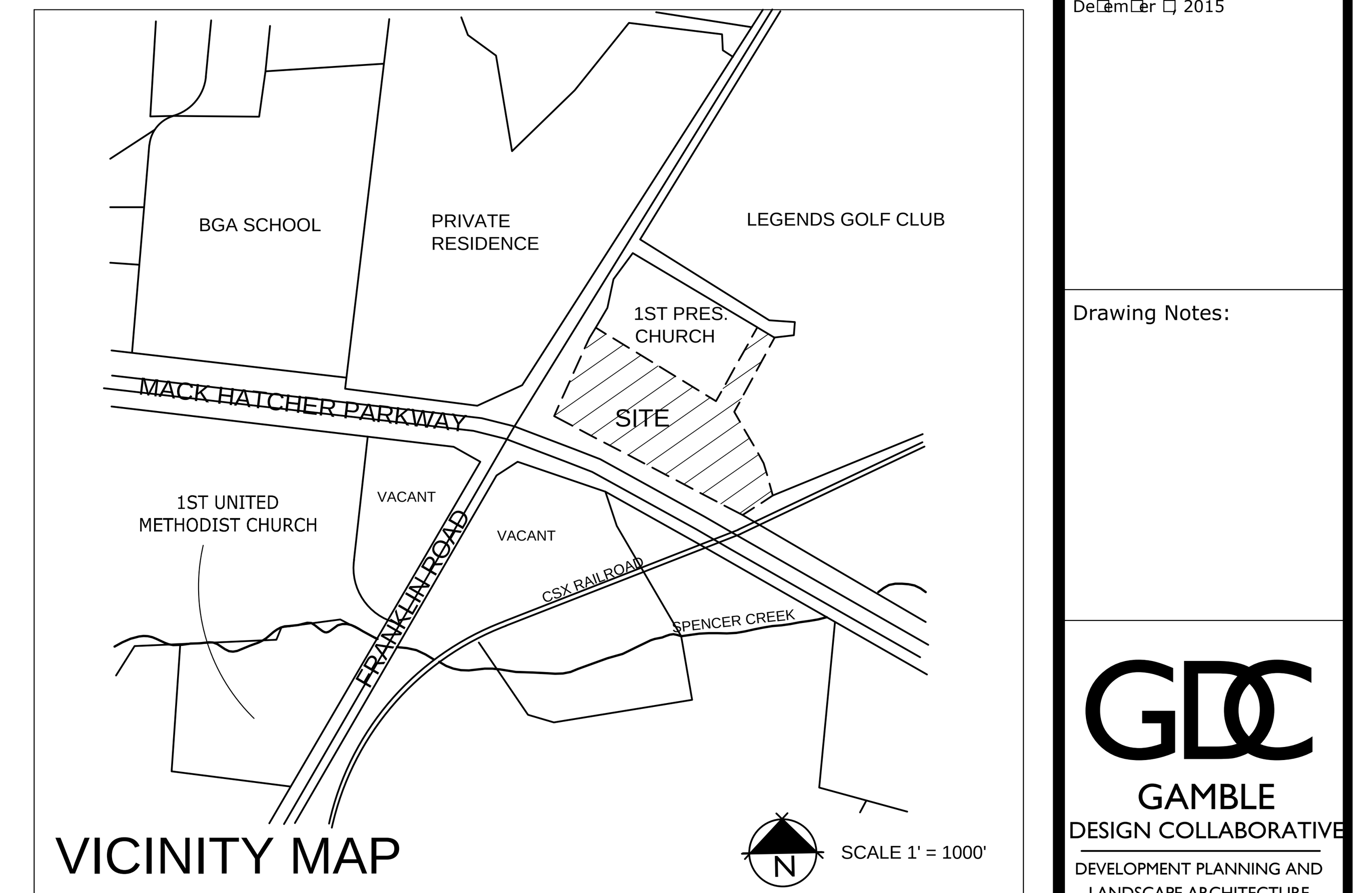
LAND USE
THE PROPOSED RESIDENTIAL COMPLEMENTS THE CHURCH AND GOLF COURSE. IT IS NOT COMPETITIVE FOR TRAFFIC TIMES AND THE GOLF CLUB AND CHURCH ARE FACILITIES DWELLERS MAY CHOOSE TO USE.
THE PROJECT WILL FURNISH POOL, TRAILS, AND CLUBHOUSE FOR RESIDENTS. THE TRAIL WILL CONNECT TO ANY EXISTING TRAILS THE CITY BUILDS.

ATTACHED RESIDENTIAL IS BENEFICIAL TO YOUNG PROFESSIONALS AND ADULTS LOOKING FOR A MAINTENANCE FREE LIFESTYLE AND SHORT COMMUTES TO WORK. THE CITY MAY WISH TO PUT THE COMPLEX ON ITS TROLLEY ROUTE. A TROLLEY STOP WOULD CONNECT RESIDENTS TO DOWNTOWN AND COOL SPRINGS VIA PUBLIC TRANSIT.

CHARACTER AREA COMPATIBILITY
a. THE MAXIMUM HEIGHT OF THE 3 FLOOR UNITS WILL BE EQUAL TO OR SHORTER THAN OTHER SIMILAR LARGE STRUCTURES IN THE CHARACTER AREA.
b. THE WIDE 150' SETBACK IS A METHOD UTILIZED TO MAKE A PROPER SETTING FOR THE 3 FLOOR BUILDING TO WORK WITHIN THE BERRYS CHAPEL CHARACTER AREA.
c. THE VIEW OF THE PROPERTY FROM MACK HATCHER IS PRESERVED BY PROVIDING THE 150 FOOT WIDE BUFFER
d. THE 3 FLOOR UNITS ARE BUFFERED BY THE EXISTING BERM AT MACK HATCHER AND FRANKLIN ROAD; THE BERM WILL BE ENHANCED WITH PLANTING AND EARTH MOVEMENT.
c. VEHICULAR & EMERGENCY ACCESS WILL BE ASSISTED BY ROADWAY IMPROVEMENTS TO FRANKLIN ROAD IN CO-ORDINATION WITH COF AND TDOT. THIS MAY OCCUR THROUGH THE EXISTING ENTRY, AN ADDITIONAL ENTRY, OR AN EMERGENCY ENTRY.

SURVEY INFORMATION
1. PROPERTY BOUNDARY LINE SURVEY PERFORMED BY LEADING AGE LAND SERVICES, 2005.

2. PLANS REFERENCE THE TENNESSEE STATE PLANE COORDINATE SYSTEM, ZONE 5301, FIPSZONE 4100; NAD 83 DATUM.



SITE DATA CHART

PROJECT NAME:	IRON HORSE
PROJECT NUMBER:	6194
SUBDIVISION:	ASPEN GROVE PUD SUBDIVISION SECTION 5
LOT NUMBER:	84
ADDRESS:	145 LEGENDS CLUB LANE
CITY:	FRANKLIN, TN
COUNTY:	WILLIAMSON
STATE:	TENNESSEE
CIVIL DISTRICT:	8TH CIVIL DISTRICT
MAP, GROUP, PARCEL NUMBERS:	MAP 62 PARCEL 43
EXISTING ZONING:	CIVIC & INSTITUTIONAL (CI)
PROPOSED ZONING:	SD-X 13.5
CHARACTER AREA OVERLAY:	BCCO-7
APPLICABLE DEVELOPMENT STANDARD:	CONVENTIONAL
TOTAL AC:	20.001 AC
TOTAL SF:	871,243.56 SF
BUILDING SETBACKS:	FRONT SOUTH & WEST 150' SIDE 10 REAR 25

OWNER:
TIMOTHY P. VACEK, CFA
IRON HORSE PARK, LLC
138 2ND AVENUE NORTH
NASHVILLE, TN 37201
615.620.5988
EMAIL rvacek@1stpartners.com

PLANNER/LANDSCAPE ARCHITECT:
GREG GAMBLE
144 SOUTHEAST PARKWAY, SUITE 200
FRANKLIN, TN 37064
615.975.5765
GREG GAMBLE
greggamble209@gmail.com

BUILDING FOOTPRINT SQUARE FOOTAGE:	139,027
BUILDING UNITS:	270 TOTAL 147 ONE-BEDROOM UNITS 123 TWO-BEDROOM UNITS
RESIDENTIAL DENSITY PROPOSED:	13.2 DUA
BUILDING PRELIMINARY HEIGHT:	BLDG A-B-E-F 3 STORY 50' BLDG C-D 2 STORY 40' CLUBHOUSE 1 STORY 35'
LANDSCAPE SURFACE RATIO:	.50
MINIMUM LANDSCAPE SURFACE RATIO:	.40
MINIMUM PARKING REQUIREMENT:	1.5 PER 1 BEDROOM 2.5 PER 2 BEDROOM 147 (1 BR) x 1.5 SPACES = 221 123 (2 BR) x 2.5 SPACES = 308 TOTAL SPACES REQUIRED: 529
MAXIMUM PARKING LIMIT (10%):	582
EXISTING PARKING:	N/A
PARKING PROVIDED:	537 TOTAL SPACES 477 SURFACE SPACES 60 GARAGE SPACES
PARKLAND (IF APPLICABLE):	FEE IN LIEU
OPEN SPACE AREAS	
OPEN SPACE REQUIREMENT	43,562 SF = 5% x 871, 244 SF TOTAL SITE AREA
FORMAL:	100% OF TOTAL SET ASIDE
FORMAL PROVIDED: 48,068 SF	A. POOL 9,811 B. TRAIL 19,100 C. LANDMARK 6,925 D. GARDEN 12,232
INFORMAL:	NONE REQUIRED

SITE DESIGN NOTES

1. THERE IS NOT A HOUSE OR BUILDING ON THE NATIONAL HISTORIC REGISTER NEAR OR WITHIN 500' OF THE DEVELOPING PROPERTY.

2. THE BUILDINGS WILL BE SPRINKLED.

3. BASED ON GRAPHIC PLOTTING OF FEMA FIRM MAPS, IT HAS BEEN DETERMINED THAT THE PARCEL DOES NOT LIE WITHIN A FLOOD HAZARD ZONE.

4. NO SLOPES GREATER THAN 14% EXIST ON THE PROPERTY .

5. THERE IS NOT A TREE CANOPY ON THIS SITE.

6. PARKLAND DEDICATION:
   270 TOTAL DWELLINGS
   35 UNITS x 1,200 SF = 42,000 SF
   235 UNITS x 600 SF = 141,400 SF
   183,400 SF / 4.21 ACRES

   PARKLAND DEDICATION WILL BE GREENWAY TRAIL AREA ALONG MACK HATCHER & FRANKLIN ROAD. EXACT LOCATION OF EASEMENT AND TRAIL SHALL BE COORDINATED WITH THE COF PARKS DEPARTMENT AT SITE PLAN STAGE.

7.11.2016 8.4.2016

Revisions:
De[illegible]em[illegible]er [illegible] 2015

Drawing Notes:

GDC
GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

Date: JULY 11, 2016

IRON HORSE DEVELOPMENT PLAN
145 LEGENDS CLUB LANE
Franklin, Williamson County, Tennessee

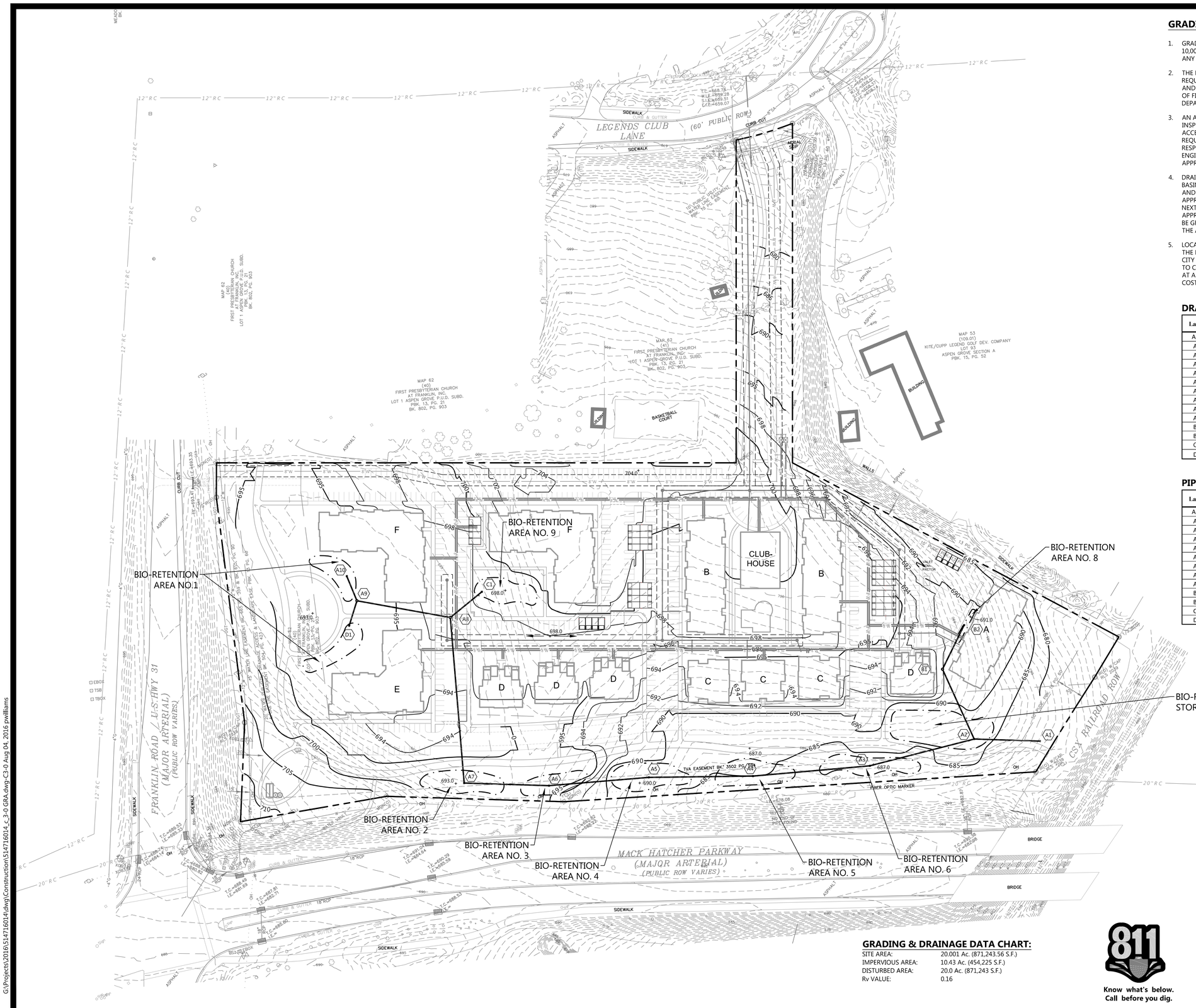
GREGORY C. GAMBLE
LANDSCAPE ARCHITECT
8.4.16

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

OVERALL DEVELOPMENT PLAN

C2.0

COF 6194



GRADING & DRAINAGE GENERAL NOTES

1. GRADING PERMIT IS REQUIRED FOR ANY PROJECT DISTURBING MORE THAN 10,000 S.F., ADDING MORE THAN 5,000 S.F. 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 COURSE 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.

DRAINAGE STRUCTURE TABLE

Label	Top of Casting (ft)	Inlet Type
A10	Water Quality Structure	93.50
A9	Junction	94.00
A8	Junction	97.00
A7	Water Quality Structure	93.50
A6	Water Quality Structure	94.50
A5	Water Quality Structure	90.50
A4	Water Quality Structure	87.50
A3	Water Quality Structure	87.50
A2	Outlet Structure	94.00
A1	Water Quality Structure	NA
B2	Water Quality Structure	91.50
B1	Junction	92.00
C1	Water Quality Structure	98.50
D1	Water Quality Structure	98.50

PIPE DATA TABLE

Label	Invert	Label	Invert	Length (ft)	Slope (ft/ft)	Pipe Size (Inches)	Type
A10	89.50	A9	89.27	46	0.50	15"	RCP
A9	89.07	A8	88.75	64	0.50	15"	RCP
A8	88.55	A7	87.05	300	0.50	15"	RCP
A7	86.85	A6	86.10	150	0.50	15"	RCP
A6	85.90	A5	85.00	180	0.50	15"	RCP
A5	84.80	A4	81.00	184	2.07	15"	RCP
A4	80.90	A3	80.80	210	0.05	15"	RCP
A3	80.60	A2	79.65	190	0.50	15"	RCP
A2	79.45	A1	78.87	116	0.50	15"	RCP
B2	87.00	B1	85.24	88	2.00	15"	RCP
B1	85.04	A2	79.65	136	3.96	15"	RCP
C1	94.00	A8	92.60	70	2.00	15"	RCP
D1	89.50	A9	89.27	46	0.50	15"	RCP

GRADING & DRAINAGE DATA CHART:

SITE AREA:	20.001 Ac. (871,243.56 S.F.)
IMPERVIOUS AREA:	10.43 Ac. (454,225 S.F.)
DISTURBED AREA:	20.0 Ac. (871,243 S.F.)
Rv VALUE:	0.16

811
Know what's below.
Call before you dig.

Revisions:
August 4, 2016

Drawing Notes:

GDC
GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE
Date: JULY 11, 2016

IRON HORSE DEVELOPMENT PLAN
145 LEGENDS CLUB LANE
Franklin, Williamson County, Tennessee

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

OVERALL SITE GRADING

C3.0

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T 615.385.4144 F 615.385.4020 www.leainc.com

7.11.2016 COF 6194

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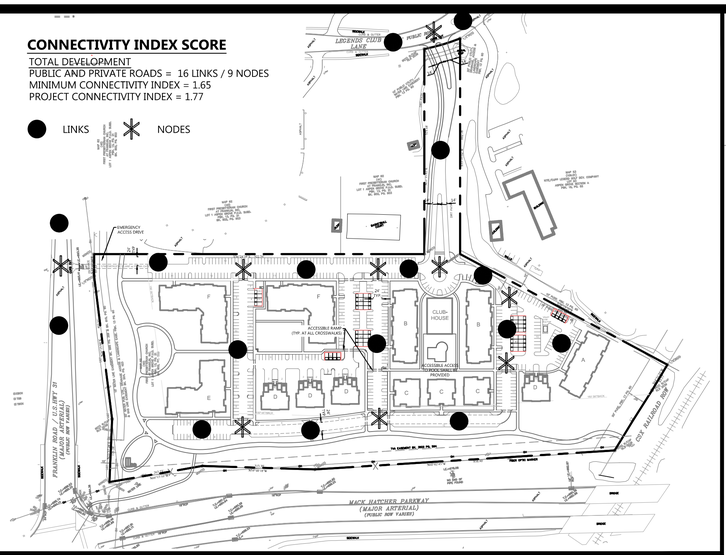
CONNECTIVITY INDEX SCORE

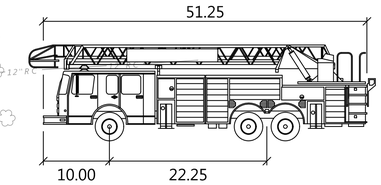
TOTAL DEVELOPMENT
PUBLIC AND PRIVATE ROADS = 16 LINKS / 9 NODES
MINIMUM CONNECTIVITY INDEX = 1.65
PROJECT CONNECTIVITY INDEX = 1.77

LINKS NODES

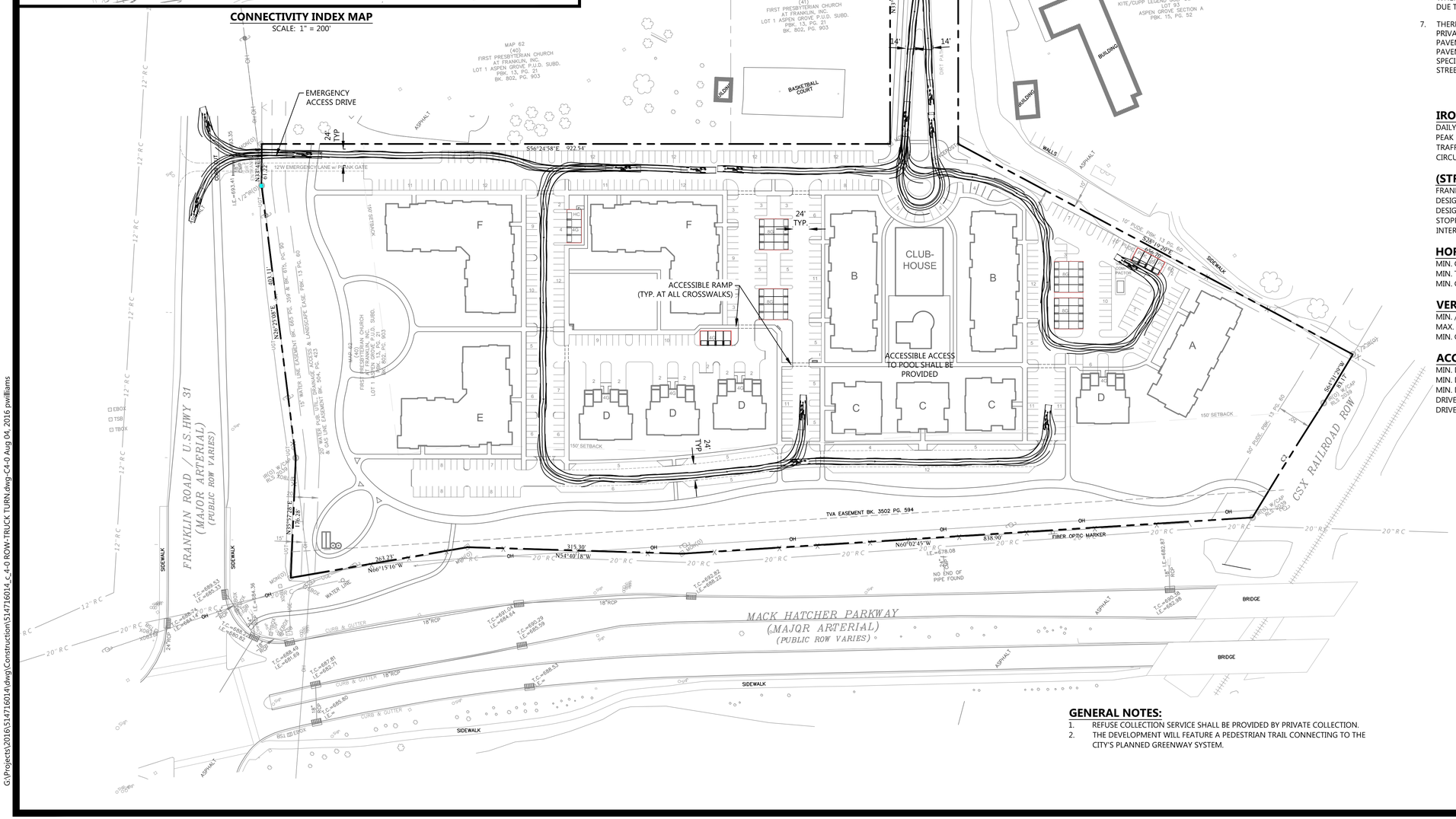


CONNECTIVITY INDEX MAP

SCALE: 1" = 200'



Franklin T2-T6	feet
Width	: 8.66
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 42.0



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.

IRON HORSE R.O.W. & ACCESS DATA CHART:

DAILY TRIP GENERATION: xxx VEH PER DAY
PEAK HOUR TRIP GENERATION: xx VEH PER HOUR
TRAFFIC IMPACT STUDY REQUIRED: y OR n
CIRCULATION PLAN REQUIRED: y OR n

(STREET NAME) DESIGN PARAMETERS:

FRANKLIN TRANSPORTATION STREET TECHNICAL STANDARDS EDITION: xxxx
DESIGN VEHICLE:
DESIGN SPEED / POSTED SPEED: xx MPH / xx MPH
STOPPING SIGHT DISTANCE: xxx FT.
INTERSECTION / DRIVEWAY SIGHT DISTANCE: xx FT.

HORIZONTAL ALIGNMENT:

MIN. CENTERLINE RADIUS: xxx FT.
MIN. TNAGENT BETWEEN CURVES / INTERSECTIONS: xx FT.
MIN. CENTERLINE ARC LENGTH: xxx FT.

VERTICAL ALIGNMENT:

MIN. / MAX. CENTERLINE GRADE: xx% / xx%
MAX. APPROACH CENTERLINE GRADE: xx% FOR xx FT.
MIN. CREST / SAG CURVE K-VALUE: xx / xx

ACCESS MANAGEMENT:

MIN. DISTANCE BETWEEN INTERSECTION: xxx FT.
MIN. DISTANCE BETWEEN HIGH VOLUME / ALLEYS & INTERSECTIONS: xxx FT.
MIN. DISTANCE BETWEEN DRIVEWAY & INTERSECTIONS: xxx FT.
DRIVEWAY WIDTH (TWO-WAY): xx-xx FT.
DRIVEWAY APPROACH STREET CONFIGURATION: xx FT. RADIUS RETURN OR CURB CUT

GENERAL NOTES:

1. REFUSE COLLECTION SERVICE SHALL BE PROVIDED BY PRIVATE COLLECTION.
2. THE DEVELOPMENT WILL FEATURE A PEDESTRIAN TRAIL CONNECTING TO THE CITY'S PLANNED GREENWAY SYSTEM.

N

0 40 80 160 240
GRAPHIC SCALE

7.11.2016 COF 6194

Revisions:
August 4, 2016

Drawing Notes:

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE
Date: JULY 11, 2016

IRON HORSE DEVELOPMENT PLAN

145 LEGENDS CLUB LANE
Franklin, Williamson County, Tennessee

ANDREW WOLTHUIS REGISTERED ENGINEER AGRICULTURE No. 109629 STATE OF TENNESSEE

GAMBLE DESIGN COLLABORATIVE
144 SOUTHEAST PARKWAY
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OVERALL ROW & ACCESS PLAN

C4.0

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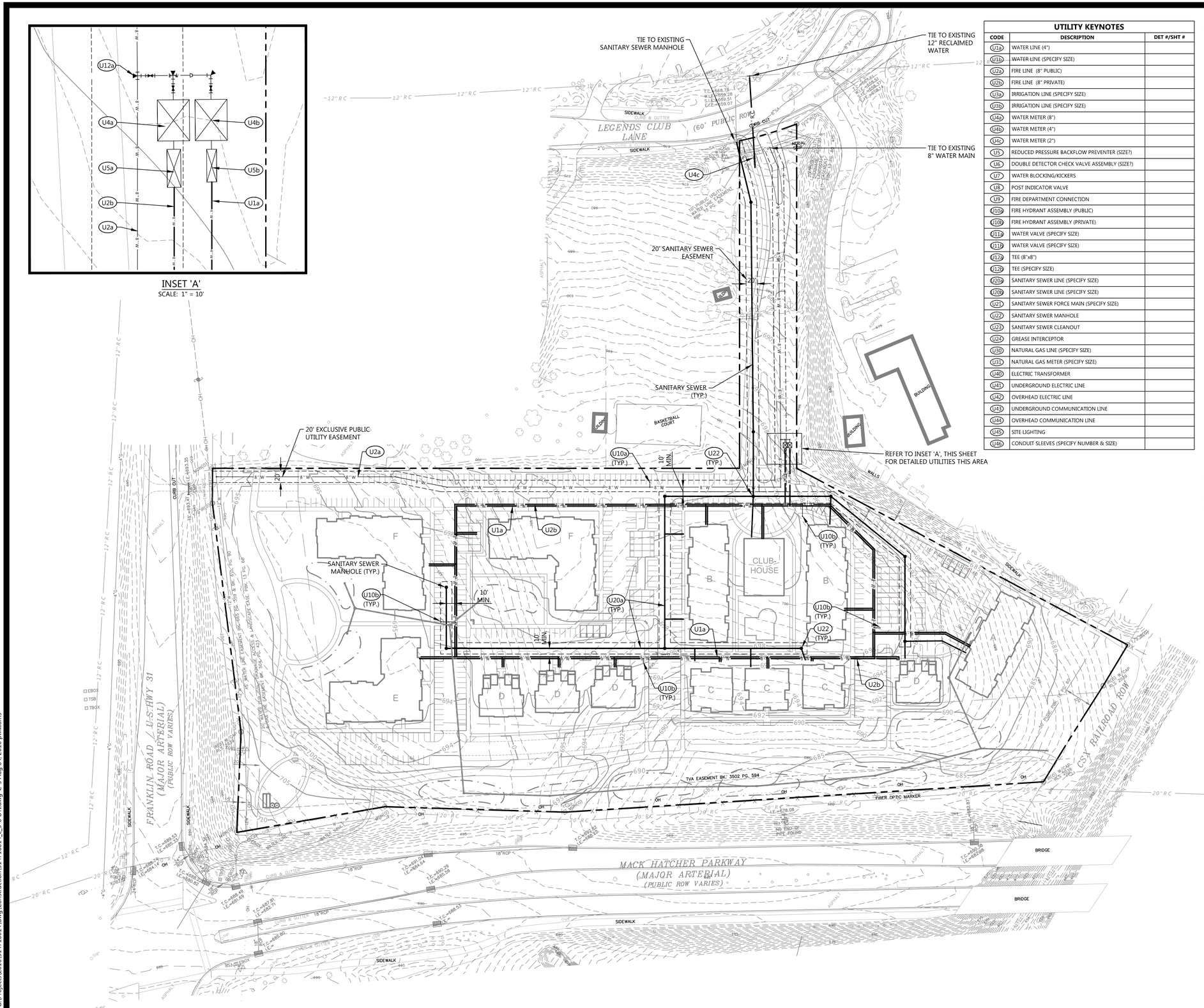
G:\Projects\2016\51471601A\dwg\Construction\51471601A_c-4-0 ROW-TRUCK TURN.dwg-C4-0 Aug 04, 2016 pwilliams

INSET 'A'
SCALE: 1" = 10'



UTILITY KEYNOTES

CODE	DESCRIPTION	DET #/SHT #
U1a	WATER LINE (4")	
U1b	WATER LINE (SPECIFY SIZE)	
U2a	FIRE LINE (8" PUBLIC)	
U2b	FIRE LINE (8" PRIVATE)	
U3a	IRRIGATION LINE (SPECIFY SIZE)	
U3b	IRRIGATION LINE (SPECIFY SIZE)	
U4a	WATER METER (8")	
U4b	WATER METER (4")	
U4c	WATER METER (2")	
U5	REDUCED PRESSURE BACKFLOW PREVENTER (SIZE?)	
U6	DOUBLE DETECTOR CHECK VALVE ASSEMBLY (SIZE?)	
U7	WATER BLOCKING/KICKERS	
U8	POST INDICATOR VALVE	
U9	FIRE DEPARTMENT CONNECTION	
U10a	FIRE HYDRANT ASSEMBLY (PUBLIC)	
U10b	FIRE HYDRANT ASSEMBLY (PRIVATE)	
U11a	WATER VALVE (SPECIFY SIZE)	
U11b	WATER VALVE (SPECIFY SIZE)	
U12a	TEE (8"x8")	
U12b	TEE (SPECIFY SIZE)	
U20a	SANITARY SEWER LINE (SPECIFY SIZE)	
U20b	SANITARY SEWER LINE (SPECIFY SIZE)	
U21	SANITARY SEWER FORCE MAIN (SPECIFY SIZE)	
U22	SANITARY SEWER MANHOLE	
U23	SANITARY SEWER CLEANOUT	
U24	GREASE INTERCEPTOR	
U30	NATURAL GAS LINE (SPECIFY SIZE)	
U31	NATURAL GAS METER (SPECIFY SIZE)	
U40	ELECTRIC TRANSFORMER	
U41	UNDERGROUND ELECTRIC LINE	
U42	OVERHEAD ELECTRIC LINE	
U43	UNDERGROUND COMMUNICATION LINE	
U44	OVERHEAD COMMUNICATION LINE	
U45	SITE LIGHTING	
U46	CONDUIT SLEEVES (SPECIFY NUMBER & SIZE)	

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 PRE-CONSTRUCTION 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.

WATER & SEWER DATA CHART:

FACILITY TYPE:
UNIT FLOW IN GPD: xxx GPD PER (UNIT)
NUMBER OF UNITS:
TOTAL FLOW IN GPD: xxx GPD

7.11.2016 COF 6194

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1935 21st Avenue South, NASHVILLE, TENNESSEE 37212
T 615.385.4144 F 615.385.4020 www.leainc.com

Revisions:
August 4, 2016

Drawing Notes:

GDC
GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE
Date: JULY 11, 2016

IRON HORSE DEVELOPMENT PLAN
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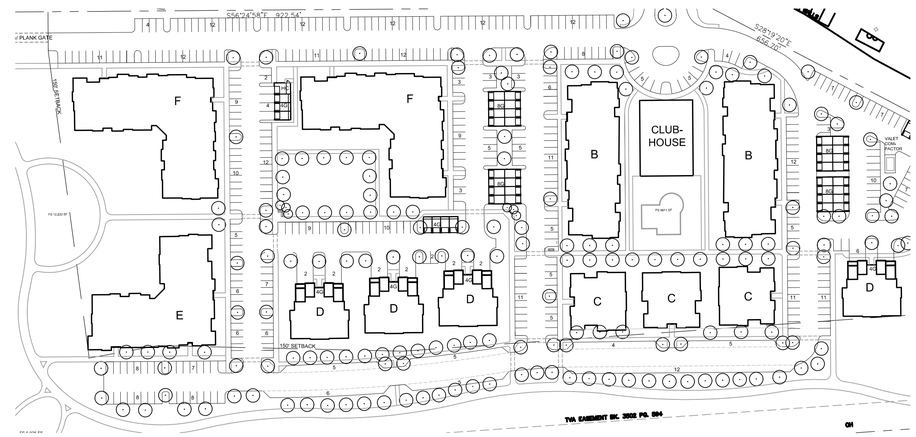
greggamble209@gmail.com
615.975.5765

OVERALL SITE UTILITIES

C5.0

G:\Projects\2016\514716014\dwg\Construction\514716014_C-5-0 UTI.dwg-C-5 Aug 04, 2016 pwilliams

ARCHITECTURAL ELEVATION
TYPE 'A' BUILDING FACADE



ARCHITECTURAL ELEVATION
TYPE 'E' BUILDING FACADE FACING
MACK HATCHER PARKWAY

ARCHITECTURAL DATA:

BUILDING HEIGHT: 3 STORIES

THE ARCHITECTURE FOR IRON HORSE WILL BE "BIG HOUSE" STYLE BUILDINGS. A BIG HOUSE BUILDING HAS MULTIPLE RESIDENTIAL UNITS UNDER ONE ROOF, BUT IS DESIGNED SIMILAR TO A LARGE MANSION. EACH BUILDING IS PLANNED TO HAVE A UNIQUE DESIGN, BUT COMPATIBLE WITH THE OTHER BUILDINGS.

THE PROPOSED ARCHITECTURAL STYLE WILL HAVE A RURAL, FARM-STYLE VERNACULAR, WITH EXTERIOR BUILDING MATERIALS OF STONE, BOARD SIDING, AND NEUTRAL COLORS.

THE CLUBHOUSE IS LOCATED ON ON AXIS WITH THE MAIN ENTRY FROM LEGENDS CLUB LANE AND WILL OFFER AMENITIES INCLUDING A POOL, FITNESS FACILITIES, AND A BUSINESS CENTER.

MATERIALS LIST:

STONE VENEER
FIBER CEMENT SIDING

ARCHITECTURAL ELEVATION
TYPE 'E' BUILDING FACADE
FACING FRANKLIN ROAD

ARCHITECTURAL ELEVATIONS
TYPE 'C' & 'D' BUILDING FRONTAGES

7.11.2016 8.4.2016

Revisions:
December 2015

Drawing Notes:

GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE
Date: JULY 2016

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ARCHITECTURAL ELEVATIONS

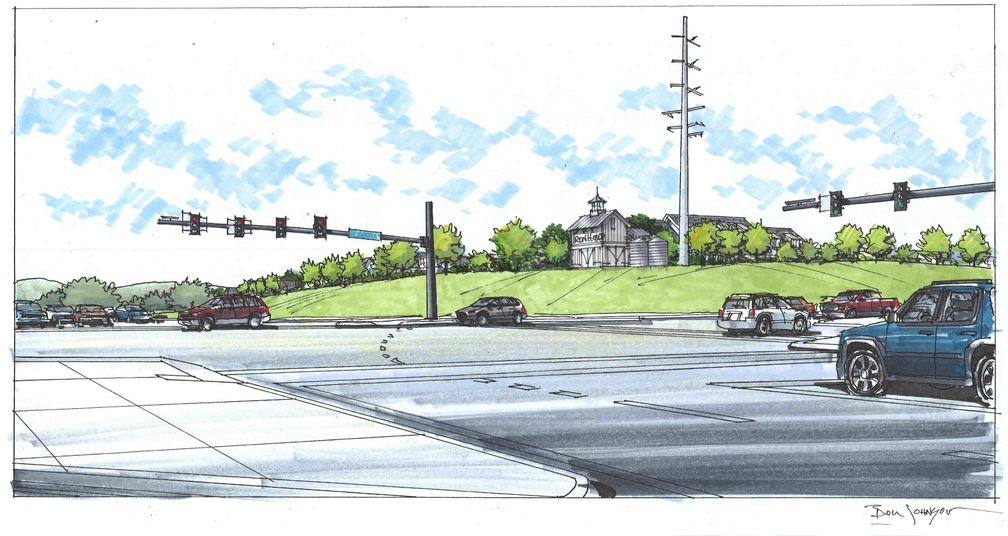
A1.0

COF 6194

ARCHITECTURAL ELEVATION
VIEW FROM MACK HATCHER BYPASS TO COMPLEX DRIVING WEST

ARCHITECTURAL ELEVATION
VIEW FROM FRANKLIN ROAD TO WESTERN DEVELOPMENT EDGE

ARCHITECTURAL ELEVATION
VIEW OF TYPICAL GARAGES



ARCHITECTURAL ELEVATION
VIEW FROM MACK HATCHER BYPASSS AT FRANKLIN ROAD
NOTE STRUCTURE IN FOREGROUND

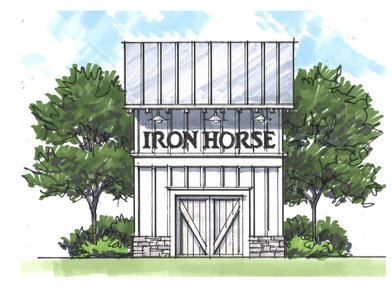
ARCHITECTURAL DESIGN INTENT

THE DEVELOPMENT WILL FEATURE A SMALL SHED-LIKE *LANDMARK STRUCTURE* AT THE CORNER OF MACK HATCHER AND FRANKLIN ROAD. THE BUILDING WILL BE CONSTRUCTED IN AN IONIC RURAL STYLE REMINISCENT OF NEARBY FARM STRUCTURES FOUND IN WILLIAMSON COUNTY.

THE BUILDING WILL BECOME A LANDMARK IDENTIFYING THE DEVELOPMENT ACROSS THE COMMUNITY.

SIGNAGE ON THE SHED WILL FOLLOW THESE GUIDELINES:
a) LESS THAN 32 SF (NOT A BILLBOARD)
b) ATTACHED TO THE LANDMARK BUILDING, &
c) LOCATED BELOW THE BUILDING ROOF LINE.

TWO GRAIN BINS CONTAINING "CISTERNS" WILL BE LOCATED ADJACENT TO THE STRUCTURE. THEY WILL BE FITTED TO STORE RAINWATER FOR IRRIGATION. THE CYLINDRICAL STRUCTURES WILL RE-INFORCE THE FARMSTEAD DESIGN STYLE OF THE DEVELOPMENT PROJECT.



7.11.2016 8.4.2016

Revisions:
Del&m□r □ 2015

Drawing Notes:

GDC
GAMBLE
DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

Date: JULY 11, 2016

IRON HORSE
DEVELOPMENT PLAN
145 LEGENDS CLUB LANE
Franklin, Williamson County, Tennessee

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

ARCHITECTURAL VIEWS

A1.1

COF 6194

CHARACTER AREAS

FRANKLIN ROAD SMALL AREA PLAN

The Franklin Land Use Plan and the Central Franklin Area Plan were adopted in February and May 2004, respectively. Both plans called for further study of the Franklin Road/Mack Hatcher Parkway intersection area because of its importance as a gateway into downtown Franklin, its exemplary scenic quality and rural character along Franklin Road, and the historical significance of surrounding key parcels, such as Harlinsdale Park and Ropers Knob and National Register properties located in the plan area.

The Franklin Road Small Area Plan (SAP) was drafted by the Franklin Municipal Planning Commission (FMPC) with valuable input from the community. Four special meetings, including a mobile workshop, were held over a period of five months. The SAP was adopted on June 22, 2006. The SAP specifies the future land uses and land use character for the area, identifies targeted development standards to preserve the scenic quality of key parcels, and provides the framework to develop the area in an environmentally sensitive way.

FRANKLIN MUNICIPAL PLANNING COMMISSION

Mike Hathaway, Chair
Carol Croop
Scott Harrison
Roger Lindsey
Alma McLemore
Mayor Tom Miller
Ann Petersen
Dennis Phillips
Fred Reynolds
Chris Ude

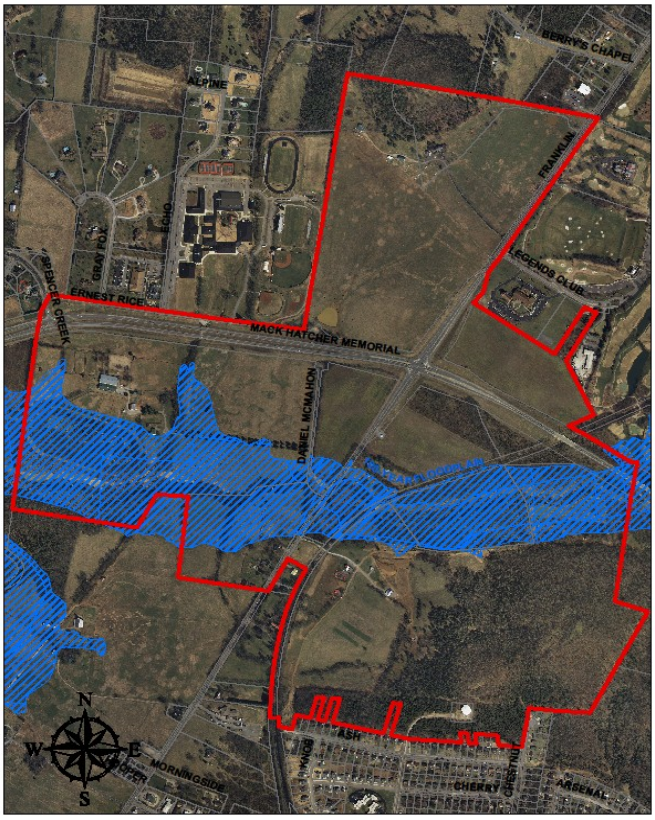
CHARACTER AREAS

EXISTING CONDITIONS

As part of the study process, existing conditions and pressing issues were identified by the FMPC, citizens, and property owners.

The following list outlines some of the major issues:

1. The area is unique and has tremendous scenic value to the community.
2. The land around the intersection is highly visible due to topography rises and elevation changes.
3. Most of the structures have significant setbacks from Franklin Road.
4. Downtown Franklin is a "charming" and economically viable city center with rural uses along Franklin Road as it transitions into the traditional town.
5. Existing street infrastructure is inadequate, and the Franklin Road/Mack Hatcher Parkway intersection is dangerous.
6. Pedestrians and bicyclists do not have a safe passage across the wide expanse of asphalt, which disconnects Central Franklin from the surrounding neighborhoods north of Mack Hatcher Parkway.
7. Private property rights should be considered alongside community desires for viewshed and corridor preservation.



FRANKLIN ROAD SMALL AREA BOUNDARIES

CHARACTER AREAS

GENERAL RECOMMENDATIONS

The following principles will guide City decision-making within the Franklin Road and Mack Hatcher Parkway area:

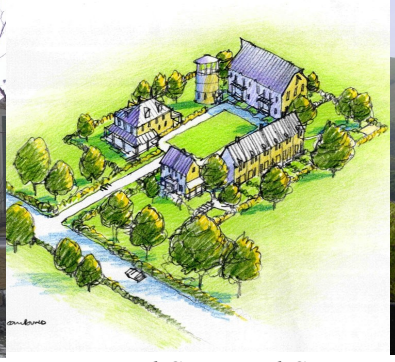
Detached Residential Conservation Subdivision
Assabet, MA

Detached Residential Conservation Subdivision,
Athens-Clarke County, GA

Desired Land Uses and Design Parameters

1. Land use character
   A) Appropriate uses include Detached and Attached Residential.
   B) Commercial uses shall not be considered.
   C) Clustered development and open space conservation of surrounding areas shall be encouraged.
   D) Trail interconnectivity should be promoted in the plan area using current and future planned trails, together with trails along the Harpeth River.

Big House Concept, New Town of St. Charles, IL



Farmstead Compound Concept, Steve Bell Rendering

Big House Concept, San Francisco

2. Appropriate scale and architecture
   A) Attached Residential may be appropriate if it has the massing and scale of Detached Residential, such as the "Big House" or "Farmstead Compound" concept, which would have multiple town house or flat units but resembles Detached Residential.
   B) Architectural sensitivity for new development shall be held in the utmost regard. The style and architecture shall draw from the surrounding area and historically significant buildings. Some of the historic dwellings in the area were built in the early 19th century and possess Federal and/or Greek Revival architecture. See the photos on the next page.

CHARACTER AREAS

Guider House,
National Register Eligible Property

Thomas Shute House, "Creekside",
National Register Property

Wyatt Hall,
National Register Property

Daniel McMahan House,
National Register Property

CHARACTER AREAS

Street Corridor Character

1. Context Sensitive Solutions (CSS) shall be used for street infrastructure improvements to the Franklin Road/Mack Hatcher Parkway area in coordination with TDOT and City Streetscape Plans. Alternative options as appropriate shall be taken to avoid widening Franklin Road and the intersection.
2. New local streets shall be rural in character, with swales instead of curbs, informal street-tree plantings and traditional rural elements, such as wood-plank fencing and stone walls.
3. The rural, scenic character of Franklin Road and Mack Hatcher Parkway shall be retained and enhanced. Streetscape improvements to Franklin Road shall be rural in nature, including informal, natural landscaping and traditional rural elements.
4. Corridor setbacks shall be a minimum of 150 feet. There shall not be parallel drives within the setback. A viewshed study shall be submitted by the applicant with any request to modify the minimum 150 feet. The purpose of this shall be to achieve optimal placement of clustered development in each quadrant to preserve the scenic viewshed and important natural features.
5. Orientation of structures shall address the streets with no rear yards between the structures and Mack Hatcher Parkway and Franklin Road. There shall be an emphasis on viewing open space from Franklin Road and Mack Hatcher Parkway, as opposed to structures.

Vehicular Circulation and Access

1. Legends Club Lane shall be the only vehicular access on Franklin Road for future development in the northeast quadrant of the intersection. If the northwest quadrant develops, then access shall be coordinated to create a four-way intersection with signalization, subject to TDOT approval.
2. Future development in the northwest quadrant shall have a street network that connects to Ernest Rice Lane.
3. A left-turn lane shall be installed for Legends Club Lane in conjunction with development in the northeast quadrant, subject to TDOT approval.
4. Daniel McMahon Lane shall be the closest access on Franklin Road from Mack Hatcher Parkway in the southwest quadrant, but may be relocated due to environmental constraints. Access to the southeast quadrant should be studied further to ensure appropriate field placement due to topography and floodplain constraints.
5. Extension of Spencer Creek Road into the southwest quadrant shall be encouraged, in conjunction with TDOT approval.

Pedestrian Circulation and Access

1. Pedestrian crossings at the Franklin Road/Mack Hatcher Parkway intersection should be further studied. The pedestrian crossing shall emphasize safety for all modes of travel.
2. A pedestrian crossing of Franklin Road is an important connection that needs to be established. Appropriate field placement of this connection should be studied, and it may result in a pedestrian tunnel or an at-grade crossing.

Franklin Road Corridor

Harlinsdale Farm

Open Space and Protection of Natural Features

1. It shall be the policy of the City to create an outstanding, award-winning greenway system and wildlife corridor in this area that serves to connect Aspen Grove Park to Harlinsdale Park to Bicentennial Park and downtown Franklin. This system shall include a pedestrian trail along Spencer Creek through this area.
2. An emphasis shall be placed on preserving significant amounts of open space south of Mack Hatcher Parkway.
3. Harlinsdale Park should be expanded if opportunities arise.
4. Land conservation and viewshed preservation need to be sensitive to maintaining existing land-development rights.
5. There shall be a restriction on over-lot grading techniques that dramatically alter site vegetation and topography. Development shall use the natural, existing topography and minimize grading to the maximum extent practicable.

Public Facilities and Service Delivery

1. Development shall be coordinated with appropriate improvements to infrastructure and public facilities and provided in a timely manner relative to the growth the facilities are intended to serve.

Open Space

1. A well-integrated network of connected open space and parks shall be encouraged to add public amenities and to preserve the existing qualities of the area.
2. Common design elements, such as fieldstone walls and wood plank fencing, shall be used to create and maintain the land-use character of the area.

SPECIAL AREA 7

Character

1. Franklin Road in this area is considered to be the last rural gateway into Central Franklin. This area is unique and has tremendous scenic value to the community. As such, it will remain a prominent and important gateway and corridor into Central Franklin.
3. Substantial areas of open space exist. Future land uses will be carefully developed to respect the rural character of the area.

Land Use

1. Established land uses include homesteads, farmsteads and large estate single family residential uses. Future development will be limited and may include clustered residential and institutional uses that maintain substantial areas of open space and preserve rural viewsheds.
2. Clustered development and open space conservation of surrounding areas shall be encouraged (FRSAP).
3. Appropriate uses include detached and attached residential. Commercial uses shall not be considered (FRSAP).
4. New growth should be encouraged only in areas where adequate public water, sewer and streets are currently available or are planned.

Development Form

1. The area should follow standards for the Rural Design Concept, unless the clustering option is employed. In the use of clustering, the traditional standards would be appropriate for the developed portion of the project.
2. Recommendations originally identified in the Franklin Road Small Area Plan, included herein, shall be applied to the area.
3. Building scale should be limited to 1-2 stories with an exception for civic and institutional buildings, which are subject to the PUD review process during which an alternative maximum height may be established.
4. Civic and institutional buildings may be appropriate in places other than Hamlets if designed in campus settings keeping with the character of the area.

5. Appropriate scale and architecture (FRSAP)
    a. Attached Residential may be appropriate if it has the massing and scale of D etached Residential, such as the "Big House" or "Farmstead Compound" concept, which would have multiple town house or flat units but resembles detached residential.
    b. Architectural sensitivity for new development shall be held in the utmost regard. The style and architecture shall draw from the surrounding area and historically significant buildings. Some of the historic dwellings in the area were built in the early 19th century and possess Federal and/or Greek Revival architecture.

Connectivity

1. The Major Thoroughfare Plan identifies the expansion of Franklin Road from 2 to 4 lanes between Mack Hatcher Parkway and Moores Lane in its short range projects. In addition, the Mallory Station Road intersection is set to be realigned with South Berrys Chapel Road at Franklin Road by 2025.
2. Coordination with TDOT is needed in the design and construction of proposed intersections with Mack Hatcher Memorial Parkway. Also, construction with TDOT is needed to ensure that Context Sensitive Design for Mack Hatcher Memorial Parkway is fully implemented for the entire loop.
3. Context Sensitive Solutions (CSS) shall be used for street infrastructure improvements to the Franklin Road/Mack Hatcher Memorial Parkway area in coordination with TDOT and City Streetscape Plans. Alternative options as appropriate shall be taken to avoid widening Franklin Road and the intersection (FRSAP).
4. New local streets shall be rural in character, with swales instead of curbs, informal street-tree plantings and traditional rural elements, such as wood plank fencing and stone walls (FRSAP).
5. The rural, scenic character of Franklin Road and Mack Hatcher Memorial Parkway shall be retained and enhanced. Streetscape improvements to Franklin Road shall be rural in nature, including informal, natural landscaping and traditional rural elements (FRSAP).
6. Corridor setbacks shall be a minimum of 150 feet. There shall not be parallel drives within the setback. A viewshed study shall be submitted by the applicant with any request to modify the minimum 150 feet. The purpose of this shall be to achieve optimal placement of clustered development in each quadrant to preserve the scenic viewshed and important natural features (FRSAP).
7. Orientation of structures shall address the streets with no rear yards between the structures and Mack Hatcher Memorial Parkway and Franklin Road. There shall be an emphasis on viewing open space from Franklin Road and Mack Hatcher Memorial Parkway, as opposed to structures (FRSAP).
8. Pedestrian crossings at the Franklin Road/Mack Hatcher Memorial Parkway intersection should be further studied. The pedestrian crossing shall emphasize safety for all modes of travel (FRSAP).
9. A pedestrian crossing of Franklin Road is an important connection that needs to be established. Appropriate field placement of this connection should be studied, and it may result in a pedestrian tunnel or an at-grade crossing (FRSAP).

10. Trail interconnectivity should be promoted in the plan area using current and future planned trails, together with trails along the Harpeth River (FRSAP).
11. It shall be the policy of the city to create an outstanding, award winning greenway system and wildlife corridor in this area that serves to connect Aspen Grove Park to Harlinsdale Park to Bicentennial Park and downtown Franklin. This system shall include a pedestrian trail along Spencer Creek through this area (FRSAP).
12. Development shall be coordinated with appropriate improvements to infrastructure and public facilities and provided in a timely manner relative to the growth the facilities are intended to serve (FRSAP).

Open Space

1. Open space should predominate the landscape. Significant areas of open space should be located along Franklin Road, hillsides, and hillslopes. Of significant interest is the Meadows Farm on the West of Franklin Road, and Jackson Lake and Legends Club on the East.
2. An emphasis shall be placed on preserving significant amounts of open space south of Mack Hatcher Memorial Parkway (FRSAP).
3. Land conservation and viewshed preservation need to be sensitive to maintaining existing land-development rights (FRSAP).
4. There shall be a restriction on over-lot grading techniques that dramatically alter site vegetation and topography. Development shall use the natural, existing topography and minimize grading to the maximum extent practicable (FRSAP).

Rural viewshed along Franklin Road

Detached residential conservation subdivision, Athens-Clarke County, GA

Big House concept, New Town of St. Charles, IL

Farmland Compound concept, Steve Bell rendering

COF no: 6194

CONDITIONS OF APPROVAL:

Engineering - PUD Plan Checklist

General Comments

1. D. Statement of Impacts

- Applicant has identified the following improvements needed to mitigate the development impacts:
  - Northbound right turn lane on Franklin Road at Mallory Station Road, and associated signal modifications.
  - Northbound right turn lane on Franklin Road at Legends Club Lane
  - Southbound left turn lane on Franklin Road at Legends Club Lane
  - The above turn lane improvements are to be bonded with TDOT, and completed and accepted prior to the issuance of the first certificate of occupancy. The above signal modifications are to be bonded with the City of Franklin, and are to be completed and accepted prior to the issuance of the first certificate of occupancy.
  - Signalization of the intersection of Franklin Road & Legends Club Lane. Such signal proposal shall be approved by TDOT, bonded with the City of Franklin, and activated when real-time field conditions warrant its operation. A bond for such field condition warrant analyses shall be posted with the City of Franklin with the final plat.
  - Only the first transportation mitigation improvement shall be eligible for Roadway Impact Fee offset. The offset agreement must be approved by BOMA prior to the approval of the site plan.

2. F. Development Plan

- Applicant shall provide detail of how emergency only access to Franklin Road is to be maintained as emergency only (i.e. not available to the general public). Provide details on the plan with specific call-out indicating gate location and how it is to be secured for emergency access only (i.e. with KnoxBox or similar lock)

3. I. Utility Plan

- Applicant shall locate all wastewater mains in exclusive easements outside of all detention basins, water quality ponds and/or other drainage structures/easements (Section 33 3113, 1.7) To clarify, no air-conditioning equipment, no pool equipment, no electric utility boxes, no cable boxes, no telephone boxes, no bioretention shall be located in the exclusive wastewater main easements. Provide the location of the existing sewer easement to the manhole adjacent to Legends Drive on the Utility Plan. The proposed sewer must be located in the center of the existing easement or the developer must obtain additional easement from the property owner.

Parks

General Comments

4. Fees In Lieu

- With the time frame for the trail system down to Spencer Creek being unknown at this time. Applicant shall work the trail back into the development to create a loop for your residents.

Planning

General Comments

5. Architecture

- Draft elevations are not being approved in their entirety with the development plan. Alterations may be needed to balconies, roof forms, etc. to achieve the single-family residential architectural style required for buildings on this site, per the Land Use Plan. Detailed elevations shall be approved with the site plan, and the Planning Department reserves the right to require changes/modifications to elevations at site plan stage should the Development Plan be approved.

6. Site Data Chart

- The applicant shall update the site data chart to include 270 units are intended for development. Several sheets still reference the 264.

7. Detached Garages

- Applicant shall ensure the proposed detached garages are not located within the 150 foot setback or in the front of buildings. The actual locations of these garages will be approved at site plan based on the location of infrastructure clear zones.

8. Viewshed Study

- Applicant shall submit a viewshed study of the impacts proposed development has for improvements in the 150 foot setback. This shall be required with the initial site plan submittal.

8.4.2016 Iron Horse Dev Plan Drawing Set.pdf

9. Acreage

- Applicant shall update site data chart to reflect the actual acreage provided by surveyor: 19.99 acres

Planning (Landscape)

General Comments

10. Issues at Site Plan

- At site plan stage these issues shall be resolved:

1. The pedestrian connection at some place are awkward and will need to be addressed.
2. The corner of Mack Hatcher needs some hardscape to identify it.
3. Plant materials in the buffer shall be discussed.

Water/Sewer

General Comments

11. Utility easement

- Applicant shall ensure permanent structures are located outside of any utility easements. The COF considers garages to be permanent structures.

8.4.2016 Iron Horse Dev Plan Drawing Set.pdf

12. Utility easement

- Applicant shall ensure footers of building "B" and any pool amenities are outside of the utility easements.

13. Storm structure conflict

- “Applicant shall at site plan, correct the conflict of sanitary and storm sewer lines near the intersections of building E and F”
- Andrew Wothers with Little John has been sent a mockup of what Ben McNeil and I think will correct this issue.

First Presbyterian Church

October 24, 2016

City of Franklin Board of Mayor and Alderman
109 Third Avenue North
Franklin, TN 37065-0305

Re: Rezoning and approval of Iron Horse Community Concept Plan

Dear Mayor Moore and Aldermen:

On October 16, 2016 the Session of First Presbyterian Franklin met with Embrey Partners to hear a presentation and discuss the development south of our church building.

The development is in keeping with the Franklin Road neighborhood and is proposed to be of high quality. The traffic issues have been addressed at Legends Club Lane and Mallory Lane.

We endorse both the rezoning and concept plan.

There are three issues that we will be discussing as site plans are developed. These are addressed in a separate letter.

We appreciate the diligence of the COF staff in following the guidelines for zoning and land use.

If you have any questions please contact me. I am the designated representative of First Presbyterian Church.

Yours truly;

Ronald Crutcher (615) 794-5442 recejc3@comcast.net

ASPEN GROVE PROPERTY OWNERS

October 18, 2016

Dear City of Franklin, Board of Mayor and Aldermen:

The Board of Directors of the Aspen Grove Property Owners Association met with the officers of Embrey Partners last month. The meeting was in regards to reviewing their development plans for the Iron Horse property at the corner of Franklin Road and Mack Hatcher Parkway.

In 2013, the Board had the pleasure to meet with Embrey Partners several times regarding their Artessa Project. Since completion, The Artessa has been a real asset to our association and to Cool Springs as a whole.

After our review of the renderings presented by Embrey Partners, we find that this second project would certainly be another quality development. The Board would therefore welcome another high-end apartment community like this one to Aspen Grove and would recommend approval by the Board of Mayor and Aldermen.

With Best Regards,

Lori Merkel, Orville Norton, Jonathan Dudor, Cianna Williams and Barbara Bedwell
2016 Board of Directors

The Aspen Grove POA is managed by Ghertner & Company, 50 Vantage Way, Suite 100, Nashville TN 37228
Contact Elecia Lewis at elecia.lewis@ghertner.com / Direct: 615-277-0344 / Fax: 615-259-4540

RESOLUTION 2016-50

TO BE ENTITLED: "A RESOLUTION APPROVING A DEVELOPMENT PLAN FOR IRONHORSE PUD SUBDIVISION WITH 1 MODIFICATION OF DEVELOPMENT STANDARDS (EXCEED BUILDING HEIGHT OF 2 STORIES), FOR THE PROPERTY LOCATED NORTH OF MACK HATCHER PARKWAY AND EAST OF FRANKLIN ROAD, 145 LEGENDS CLUB LANE."

WHEREAS, the Board of Mayor and Aldermen (BOMA) of the City of Franklin, Tennessee, has, or will, approve the zoning for the property as part of Ordinance 2016-34; 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; and

WHEREAS, in accordance with the provisions of *Tennessee Code Annotated* § 13-4-310, as amended, and subject to the exceptions set forth in said statute, the approval of the Development Plan by the BOMA will initiate a vesting period during which the development standards adopted by the City and in effect on the date of approval shall remain the standards applicable to the approved Development Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF MAYOR AND ALDERMEN 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
062---04300	19.99
Total	19.99

Legal Description

Being a tract of land lying in the 8th District of Williamson County, Franklin, Tennessee. Tract being Lot 84 of Aspen Grove, Section V as recorded in Plat Book 13, Page 60, Register's Office of Williamson County, Tennessee (ROWC). Bounded on the west by the eastern Right-of Way (ROW) of U.S. Highway 31 (Franklin Road) and by Lot 1 of Aspen Grove PUD Subdivision as recorded in Plat Book 13, Page 21, ROWC, on the north by said Lot 1 of Aspen Grove PUD Subdivision and by the southern ROW of Legends Club Lane, on the east by Lot 93 of Aspen Grove, Section A as recorded in Plat Book 15, Page 52, ROWC, and on the south by the northern charter ROW of CSX Railroad and the northern ROW of Mack Hatcher Parkway. Tract being more particularly described as follows:

POINT OF BEGINNING being a concrete monument at the intersection of the northern ROW of said Mack Hatcher Parkway and the eastern ROW of said Franklin Road; thence with the eastern ROW of said Franklin Road, North 35°57'28" East 176.28 feet to an iron rod with RLS# 2039 cap; thence North 26°25'08" East 403.11 feet to a ½" iron rod; thence North 33°47'34" East 61.22 feet to a point; thence leaving the ROW of said Franklin Road with the common line of said Lot 1 of Aspen Grove PUD Subdivision, South 56°24'58" East 922.54 feet to a concrete monument; thence North 33°35'02" East 573.18 feet to an iron rod with RLS# 2039 cap; thence with the southern ROW of said Legends Club Lane along a curve to the left having a length of 104.41 feet, a radius of 630.00 feet, a central angle of 09°29'44", and having a chord bearing and distance of South 72°54'14" East 104.29 feet to a ½" iron rod; thence leaving said ROW of Legends Club Lane with the common line of said Lot 93 of Aspen Grove, Section A, South 33°35'02" West 602.78 feet to a fencepost; thence South 28°19'20" East 656.70 feet to a ½" iron rod; thence with the charter ROW of said CSX Railroad, South 64°31'29" West 83.17 feet to an iron rod with RLS# 2039 cap; thence with a curve to the left having a length of 198.12 feet, a radius of 6131.57 feet, a central angle of 01°51'05", and having a chord bearing and distance of South 65°27'36" West 198.11 feet to an iron rod with RLS# 2039 cap; thence leaving said charter ROW of CSX Railroad with the northern ROW of said Mack Hatcher Parkway, North 60°02'45" West 838.90 feet to a concrete monument; thence North 54°40'18" West 315.30 feet to a concrete monument; thence North 66°15'16" West 263.23 feet to the point of beginning. Tract contains 870,808 square feet, or 19.99 acres. Bearings based on Tennessee State Plane Coordinate System.

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 Ironhorse PUD Subdivision are as follows:

Entitlements	Ironhorse PUD Subdivision
Base Zone District	Specific Development Residential (SD-R 13.5) District
Character Area Overlay	BCCO - 7
Development Standard	Conventional
Number of Dwelling Units	270
Open Space Requirements	43,562 square feet
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 Aldermen, after review and recommendation by the Franklin Municipal Planning Commission:

MOS 1: Exceed maximum building height of 2 stories. Elevations "C", "D", "E", and "F" are all considered to be 3 stories. Approved: _____ Denied: _____	Request to approve. *Staff recommended approval.*

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
City Administrator

_____
Dr. Ken Moore
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

PREAPPLICATION CONFERENCE: 6/23/2016

BOMA/FMPC JOINT CONCEPTUAL WORKSHOP: 6/23/2016

NEIGHBORHOOD MEETING: 6/22/2016

PLANNING COMMISSION RECOMMENDED APPROVAL: 8/25/2016

PUBLIC HEARING AND BOMA APPROVAL: _____

RESOLUTION 2016-62

A RESOLUTION TO FINALIZE THE DESIGN AND CONSTRUTION FOR THE LEWISBURG PIKE (U.S.431) ROADWAY PROJECT

WHEREAS, the concept plan for the Berry Farms Town Center was approved in 2006 and required the developer to make certain improvements to Lewisburg Pike (U.S. 431); and

WHEREAS, the proposed improvements to Lewisburg Pike (U.S. 431) included a four-lane, median divided facility from Goose Creek Bypass to Old Peytonsville Road as shown on the Berry Farms Town Center approved concept plan; and

WHEREAS, Lewisburg Pike (U.S. 431) is a major arterial roadway and is intended to primarily serve moderate to high traffic speeds and volumes within and through the City; and

WHEREAS, Evaluating traffic counts and growth factors, derived from the City's travel demand model, it is anticipated that that the Annual Average Daily Traffic (AADT) volumes will be exceed 20,000 vehicles per day along this segment; and

WHEREAS, the medians as shown in the approved concept plan restricted access to the property located at 1308 Lewisburg Pike (U.S. 431); and

WHEREAS, the Board of Mayor and Aldermen have reevaluated the medians and access control along Lewisburg Pike (U.S. 431); and

NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF MAYOR AND ALDERMEN OF THE CITY OF FRANKLIN, TENNESSEE, that Option ____, as shown on (Exhibit A), be selected and the City Administrator shall be authorized to spend the additional funding necessary to complete the project.

IT IS SO RESOLVED AND DONE on this the ____ day of _____, 2016.

ATTEST:

By:_____

ERIC S. 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 09.08.16

Res 2016-62 - Exhibit A
PG 1 of 4
Option 1
1304 Lewisburg Pike
1308 Lewisburg Pike
1312 Lewisburg Pike
N
City of Franklin GIS Dept.

Res 2016-62 - Exhibit A
PG 2 of 4
Option 2
1304 Lewisburg Pike
1308 Lewisburg Pike
1312 Lewisburg Pike
N
City of Franklin GIS Dept.

Res 2016-62 - Exhibit A
PG 3 of 4
Option 3
1304 Lewisburg Pike
1308 Lewisburg Pike
1312 Lewisburg Pike
N
City of Franklin GIS Dept.

Res 2016-62 - Exhibit A
PG 4 of 4
Option 4
1304 Lewisburg Pike
1308 Lewisburg Pike
1312 Lewisburg Pike
N
City of Franklin GIS Dept.

To Whom It May Concern:

I met with Mr. Paul Holzen at my home, 1304 Lewisburg Pike, this past Friday, July 22. During this time, I was presented with photographs illustrating the three different scenarios to address the situation regarding the median and how it will affect my home and the two homes to the South of me. I am of the opinion that this is a rather difficult situation for all parties involved. Unfortunately it seems that there is little possibility of reaching a solution that does not create ill will amongst the neighbors. I realize the city would like to keep the median for safety reasons. With this in mind, my first choice would be to keep the median with no vegetation other than grass. My second choice would be to do away with the median all together. I would like to point out that of my neighbors, I have lived here the longest, and my property has been affected the greatest by the Berry Farm development. I hope this will be taken into consideration regarding any future decisions that will further affect my property.

Rhonda Martocci

Res 2016-62 - Exhibit A
PG 1 of 4
Option 1
1304 Lewisburg Pike
1308 Lewisburg Pike
1312 Lewisburg Pike
N
City of Franklin GIS Dept.

Res 2016-62 - Exhibit A
PG 2 of 4
Option 2
1304 Lewisburg Pike
1308 Lewisburg Pike
1312 Lewisburg Pike
N
City of Franklin GIS Dept.

Res 2016-62 - Exhibit A
PG 3 of 4
Option 3
1304 Lewisburg Pike
1308 Lewisburg Pike
1312 Lewisburg Pike
N
City of Franklin GIS Dept.

Res 2016-62 - Exhibit A
PG 4 of 4
Option 4
1304 Lewisburg Pike
1308 Lewisburg Pike
1312 Lewisburg Pike
N
City of Franklin GIS Dept.

GSRM LAW

GULLETT SANFORD
ROBINSON & MARTIN PLLC

150 THIRD AVENUE SOUTH, SUITE 1700
NASHVILLE, TN 37201

M 615.244.4994
F 615.256.6339
W GSRM.COM

August 22, 2016

Via Electronic Mail and Hand Delivery
Board of Mayor and Aldermen
City of Franklin
City Hall
109 Third Avenue South
Franklin, Tennessee 37064

Re: Lewisburg Pike Access Issues

Dear Board of Mayor and Aldermen:

This firm represents Ms. Susan Harlan, who owns a National Register of Historic Places property known as "Walnut Winds," which is located outside of the Franklin city limits in Williamson County, at 1312 Lewisburg Pike. As you know, the agenda for the Board of Mayor and Alderman work session to be held tomorrow includes issues related to a parcel also located outside the City limits in Williamson County owned by Mr. and Mrs. John Philips.

The Phillips purchased their property, located at 1308 Lewisburg Pike, in January of 2015. Immediately across the street, construction of a large, mixed-use development project, known as Berry Farms, was already well underway. In conjunction with the Berry Farms project, a median was installed on Lewisburg Pike based on plans approved in 2006, which blocked the Phillips' ability to make a left turn out of their driveway onto Lewisburg Pike. As discussed further below, months after the Phillips identified this issue, Mr. Phillips approached Ms. Harlan regarding the possibility of a private easement to move his driveway across her property and into her driveway, so that he could exit at a break in the median. When Ms. Harlan declined given the historic significance of her property and the fact that a large and very old tree line would be destroyed under the proposal, Mr. Phillips began urging the City of Franklin to condemn Ms. Harlan's property to remedy this inconvenience. In response to Mr. Phillips' concerns, the City Engineer has prepared a report containing four potential options, one of which is for the City to take no action (Option 1). The City Engineer declined to make a recommendation in his report, and is now seeking input from the Board on how to proceed.

One of these options, identified as Option 2, would require the City's taking of a portion of Walnut Winds by eminent domain. However, eminent domain is not available under these facts. The City may not take Ms. Harlan's land, which is located in the County, for the purpose proposed. A key element of the exercise of eminent domain is that the property sought to be acquired must be for a "public purpose." "[I]t has generally been held that the state does not have power to authorize the taking of the property of an individual without his consent *for the private use of another*, even on the payment of full compensation." *Cross v. McCurry*, 859 S.W.2d 349, 353 (Tenn. Ct. App. 1993) (emphasis added). *See also, e.g., Montgomery v. Carter County*, 226 F.3d 758, 771 (6th Cir. 2000) ("If a taking had to be considered one for a public use simply by virtue of the fact that it benefits at least one other person . . . there would be little left to the prohibition against private-use takings.") Benefit to a single person has consistently been held to be wholly insufficient to constitute a public purpose necessary to take another's property.

The Tennessee Legislature concurs. In response to the United States Supreme Court's decision in *Kelo v. City of New London*, 545 U.S. 469 (2005), Tenn. Code Ann. § 29-17-101 was amended to emphasize that "the power of eminent domain shall be used sparingly, and that laws permitting the use of eminent domain shall be narrowly construed so as not to enlarge, by interference or inadvertently, the power of eminent domain." The Public Act amending Tenn. Code Ann. § 29-17-101 further provided that the definition of "public use" "shall not include either private use or benefit . . . ." 2006 Tenn. Pub. Acts 2143, 2144. Franklin's own municipal Charter, enumerating the City's powers, states that property may only be condemned "for present or future *public use for any municipal purpose*." Franklin Municipal Code, Charter, Part I.1, Art. II, Section I (6) (emphasis added).[1]

The proposed taking at issue is for a purely private purpose on property not even located in the City—to allow Mr. and Mrs. Phillips to avoid the inconvenience of not being able to turn left out of their driveway. However inconvenient this may be for them, it simply does not rise to the level of a "public purpose" as required by the Tennessee and Federal Constitutions. For this reason alone, the City is not permitted by law to take Ms. Harlan's land as proposed in Option 2.

In the event Mr. and Mrs. Philips did not have *any* access to their property, Tennessee law would allow them to privately condemn access—without involving the City whatsoever. In fact, prior to involving the City, Mr. Phillips approached Ms. Harlan to ask her to grant him a private easement across her property. When Ms. Harlan declined, Mr. Phillips contacted the City in an effort to convince the City to improperly condemn Ms. Harlan's property for his private convenience.

If Mr. and Mrs. Phillips had truly believed that they were entitled to a private taking, they could have filed suit under the appropriate statute and need not have involved the City at all. Mr.

[1] Considering the language of the City's Charter requiring its condemnation power to be used for a "municipal purpose," it is unclear whether the Board would even have jurisdiction over this issue. Option 2 involves access to a State road, proposes taking of a County property, and at its root involves a purely private purpose—all of which necessarily begs the question of whether there should be any City involvement at all. The City Attorney's office has confirmed that they could not even file such an action seeking condemnation and, instead, the City would have to seek the assistance of outside counsel to address the issue.

and Mrs. Phillips' claims, however, do not rise to the level needed to effectuate a private taking. *See* Tenn. Code Ann. § 54-14-101. "The existing statutes governing the condemnation of private property are thus designed to provide a remedy for *landlocked* property owners while protecting, to the extent possible, the interests of the servient estate owner." *Barge v. Sadler*, 70 S.W.3d 683, 687 (Tenn. 2002). To entitle a party to condemnation of a right-of-way, it must appear that the right-of-way is required as "a matter of necessity." *Towater v. Darby*, 15 Tenn. App. 53, 60 (Tenn. Ct. App. 1932). The statute conferring the power of eminent domain upon one private person to take another's property does not apply where such party already has adequate ingress and egress. *Vinson v. Nashville, C. & S. L. Ry.*, 321 S.W.2d 841, 843 (Tenn. Ct. App. 1958). *Vinson* specifically held that the statute does not warrant condemnation "as a mere matter of convenience." *Id.*

Mr. and Mrs. Phillips are not landlocked, nor is a right-of-way required as a necessity, which is why they have resorted to requesting that the City condemn as a remedy to the alleged inconvenience caused by loss of the ability to make a left turn. Mr. Phillips has even admitted in conversations with counsel for Ms. Harlan that there is no safety concern with entering or exiting his driveway. Rather, Mr. Phillips admitted his concern is the inconvenience that came with losing the ability to turn left out of his driveway—nothing more. That inconvenience cannot be shifted to another private owner of property—here, Ms. Harlan. In other words, a government entity may not remove an inconvenience to one property owner by taking the rights of another.

Clearly, the purely-private benefit proposed to be conferred upon Mr. and Mrs. Phillips, as set forth in Option 2, does not come close to the public purpose required to take Ms. Harlan's property. Other arguments advanced to justify a taking under Option 2 are also wholly without merit. First, it has been suggested that Option 1 will prevent Franklin Fire Department trucks from being able to directly access Mr. and Mrs. Phillips' property and will delay fire response times in the event an emergency should arise. It has been alleged that City fire trucks will be unable to make a U-turn on Lewisburg Pike in order to reach the Phillips' property. These allegations are made without any citation or basis.

First, the property is located in the County and has been serviced by Williamson County Fire Station 14. Contrary to the City's arguments, in an interview on July 26, 2016, a firefighter of Williamson County Fire Department Station 14 directly contradicted the argument that Option 1 would impede life safety access to the Phillips' home. The firefighter stated that Station 14 has been servicing 1308 Lewisburg Pike. To enter into the Phillips' property, the fire trucks currently turn right into the driveway. Thus, there is no need to even address the median under the current situation. In approximately two months, however, a new county fire station on Goose Creek Bypass will be opened. This station, which will be known as Station 24, will then service 1308 Lewisburg Pike. The firefighter confirmed that there would be no meandering, alternate route to get to 1308 Lewisburg Pike from Station 24 due to the median. Instead, he advised that a fire truck would simply make a U-turn on the North side of the median and would return South on Lewisburg Pike back to the house. He said that the firetruck would have no problem making a U-turn at that particular median and that this process would not add even one minute to the response time. He further stated that the fire truck could also choose to cross over to the other side of the median into oncoming traffic to turn into 1308 Lewisburg Pike. He advised that fire trucks regularly do this in the normal course without any problem whatsoever. Again, neither

alternative would require any alternate, meandering route or add any significant response time in servicing 1308 Lewisburg Pike. Therefore, there is no legitimate safety concern associated with Option 1.

Additionally, although 1308 Lewisburg Pike is located in unincorporated Williamson County and therefore would be served by the Williamson County Fire Department, a witness familiar with the operation of fire trucks in the City of Franklin opined on July 31, 2016, that a fire truck should be able to turn into the driveway entrance for 1308 Lewisburg Pike without any difficulty. Further, the witness stated that, if the firefighter felt for whatever reason he could not make the turn into the drive, the firefighter could simply drive over the median from the opposite side of the road. The witness saw no issues with access to 1308 Lewisburg Pike with the road and median as they are now, further showing that there is no legitimate safety issue with Option 1.

Further to safety issues, no one has argued that making a right turn out of the Phillips' property creates any safety issue that could arguably be a public purpose to justify a taking. In fact, Mr. Phillips has admitted there is no safety concern with making a right turn out of his driveway. Instead, he argues that because the median blocks a *left* turn out of the driveway, Option 1 will result in them being required to make a U-turn at an intersection—not in front of their property—further down Lewisburg Pike, each time they wish to travel North on Lewisburg Pike. Mr. Phillips indicates that he believes this U-turn would be unsafe altogether, or at minimum less safe than a left turn out of his driveway. Of course, thousands of Tennessee homeowners cannot make a left turn out of their properties due to medians or traffic volumes and have to find alternate routes in the event they wish to proceed in that direction. That is not a basis to take thousands of neighbors' property to create an untold number of private access drives paved and maintained in perpetuity by taxpayers' dollars. The issue is whether the Phillips have safe ingress and egress onto a public roadway. They do—via a right turn. How they handle routes and safety once on the public road cannot be the basis for a taking here.

What the Phillips want this Board to use as a public safety purpose related to the property at issue is inappropriate and is a red herring. They inappropriately focus on this proposed U-turn down the road from their property. Even if a U-turn at that intersection is determined to be unsafe, it is not a safety hazard for the Phillips related to their property. As licensed drivers, they are charged with choosing a safe route of travel. U-turns are widely permitted in the City of Franklin. The Tennessee Department of Transportation will determine whether the intersection at issue is safe for a U-turn. If not, it will clearly mark that no U-turn is permitted. If such a U-turn is deemed unsafe or the Phillips simply feel unsafe making such a turn, then they should not make such a turn and instead should proceed via another route to safely return to the North. For example, the Phillips have the option of turning right out of their driveway and then left into the Berry Farms subdivision, where they will have ample room to turn around and exit back onto Lewisburg Pike via a right turn. Again, simply because the Phillips may *prefer* not to make a U-turn or take a different, alternate route does not make this a public safety issue for their property.

Instead, this all really relates to the loss of a convenience by the Phillips due to the installation of the median in connection with the Berry Farms development, as Mr. Phillips has admitted. The proper means for the Phillips to address this loss—due to plans previously blessed

and approved by TDEC and the City as safe—is not to attempt to take their neighbor's property. Rather, they or their predecessors-in-interest should have challenged the placement of the median when its construction was first proposed. Had the Phillips or their predecessors-in-interest felt the taking of their ability to make a left turn devalued their property or was a safety risk, they should have challenged the alleged taking at that time. If they had done so and had not prevailed, then they certainly could have asserted their rights—either in a condemnation proceeding filed by the government or via an inverse condemnation action if no condemnation proceeding was instituted—to seek compensation for the diminution of value to their property based on losing their ability to make a left turn. They cannot now seek to shift the burden of any taking of their rights to Ms. Harlan, simply because they failed to pursue their rights against the government.

Further, another of the options presented is designed to eliminate the alleged safety concerns argued by Mr. Phillips that would not seek to unconstitutionally take any of the County residents' properties. This option—Option 4—would involve removing the median in front of 1308 Lewisburg Pike altogether. None of the homeowners' rights would be adversely affected under this option. In fact, it would provide further safety in the area generally by removing any possibility of vegetation in a median that impedes the line of sight for neighbors turning left onto Lewisburg Pike from their homes. Mr. Phillips' alleged concerns over the loss of a left-hand turn would no longer be an issue. Moreover, while it has been suggested that this option may be the most expensive, that is not the case. Other than taking no action, this would be the most cost-effective solution, avoiding the other alternatives involving long and extensive legal challenges to unconstitutional attempts to condemn that—even if successful—would require compensating one or more homeowners for highly-valuable and historic land located in the County.

Finally, in closing, Ms. Harlan's home, which was originally built in the 1840s, is listed on the National Register of Historic Places. Her property is bordered by a stand of extremely-mature trees and landscaping that will not be able to be replaced by way of maturity and screening in our lifetime. If the City decides to attempt to take her property to complete the throughway proposed by Option 2, these trees would be demolished, greatly diminishing the historical value, site and setting of Walnut Winds. Ms. Harlan considers herself a steward of this property, and her primary goal is to ensure its protection and preservation. She is currently in discussions with the Heritage Foundation of Franklin and Williamson County regarding placing the property into a conservation easement. She has no intent to develop this property and wishes to see it preserved for generations to come. Walnut Winds is a valuable piece of Williamson County's history and its Civil War story. The Phillips' proposals would permanently scar Walnut Winds, simply to abate an inconvenience. That is no basis for a taking.

Accordingly, Ms. Harlan respectfully requests that the Board reject Option 2, as it would be an unconstitutional taking of Ms. Harlan's land.

Sincerely,

Joshua R. Denton

cc: Mr. Eric Stuckey
Kristen Corn, Esq.

RESOLUTION 2016-56

A RESOLUTION AWARDING THE CONSTRUCTION CONTRACT (COF CONTRACT NO. 2014-0288) TO REVERE CONTROL SYSTEMS, INC., IN THE AMOUNT OF $1,949,980.00 FOR THE WATER DISTRIBUTION & COLLECTION SYSTEM SCADA IMPROVEMENTS PROJECT

WHEREAS, the Water Distribution & Collection System SCADA Improvements Project is one of the projects identified in the Integrated Water Resources Plan as a short range project; and

WHEREAS, the construction of the Water Distribution & Collection System SCADA Improvements Project generally includes the furnishing of all materials, equipment and labor for the following: installation of a PC-based SCADA workstation at Public Works, installation of a Master remote telemetry unit (RTU) at Public Works to include a new antenna, antenna tower and all necessary cabling, installation of a programmable logic controller (PLC) based RTU at each of the listed system sites, the establishment of dual redundant communication between the Master RTU and all listed remote sites, and application engineering services to program the RTU PLCs, configure the SCADA network equipment, and program, configure and design of the SCADA human-machine interface (HMI) software; and

WHEREAS, on August 9, 2016, sealed bids were received in the office of the City Engineer, City Hall, 109 3rd Avenue South, Franklin, Tennessee 37065 and were publicly opened and read aloud for the Water Distribution & Collection System SCADA Improvements Project (COF Contract No 2014-0288).

NOW THEREFORE, BE IT RESOLVED by the Board of Mayor and Aldermen of the City of Franklin, Tennessee, that approval is granted for the bid award to Revere Control Systems, Inc. for the Water Distribution & Collection System SCADA Improvements Project (COF Contract No. 2014-0288) in the amount of One Million Nine Hundred Forty-Nine Thousand Nine Hundred Eighty and No/100 Dollars ($1,949,980.00).

BE IT FURTHER RESOLVED BY THE BOARD OF MAYOR AND ALDERMEN OF THE CITY OF FRANKLIN, TENNESSEE that the Water Management Director is hereby authorized to have authority to review and approval the spending of all project funds included in the bid and award of the construction contract for the Water Distribution & Collection System SCADA Improvements Project (COF Contract No. 2014-0288).

IT IS SO RESOLVED AND DONE on this ___ day of _____, 201__.

ATTEST:

By:_____

Eric S. Stuckey
City Administrator

CITY OF FRANKLIN, TENNESSEE:

By:_____

Dr. Ken Moore
Mayor

Approved as to Form

By: _____
Shauna R. Billingsley
City Attorney

CDM Smith

3715 Northside Parkway NW
Building 300, Suite 400
Atlanta, Georgia 30327
tel: 404 720-1400

August 18, 2016

Mr. Mark S. Hilty, Director
City of Franklin Water Management Department
124 Lumber Drive
Franklin, Tennessee 37064

Subject: Evaluation of Bids – Water Distribution & Collection System SCADA Improvements
COF Contract No. 2014-0288

Dear Mr. Hilty:

Bids for the above referenced project were received on August 9, 2016, at 2 p.m. local time and subsequently opened. The bidders and their Total Bids are summarized in the certified Bid Tabulation, three copies of which are attached to this letter. The bids are listed below and in the Bid Tabulation in numerical order, with the low bidder listed first.

Bidder		Total Bid
1	Revere Control Systems Inc.	$1,949,980
2	PowerTek LLC	$2,098,322

The Engineer's Opinion of Probable Construction Cost was $3.5 million.

Each bidder acknowledged receipt of the three Addenda issued for this project and supplied a Bid Bond in the amount of 5 percent of the Total Bid. Bids for this project are to remain firm for a period of 90 calendar days, excluding Saturdays, Sundays, and legal holidays after the actual date of the opening of the bids; the bids will expire on December 16, 2016.

Each bidder submitted a Bid Proposal containing the following information as required by the Bid Documents.

- Bid Form (Section 00300), including Part 1 – Base Bid and Part 2 – Bid Summary
- Bid Security (Section 00410, Bid Bond), including Power of Attorney
- Indemnification Agreement (Section 00420)

- Affidavit of Drug-Free Workplace (Section 00440)
- Affidavit of Title VI Compliance (Section 00450)
- Affidavit of Non-Collusion (Section 00480)
- Tennessee Contractor's License Number

CDM Smith verified the status of each bidder's contractor's license using the License Search and Verification service at the State of Tennessee Department of Commerce & Insurance's Web site (http://verify.tn.gov/). Each bidder possesses a valid Class CE (Electrical Contracting) license with an Unlimited monetary limit.

Along with their Bid Proposals, both bidders submitted evidence that they had contacted, in letters sent via certified U.S. Mail or United Parcel Service, at least 10 certified Disadvantaged Business Enterprise (DBE) subcontractors, professional service providers, suppliers, and/or equipment vendors in order to solicit their subcontract participation in the work. This evidence was provided in accordance with the State Revolving Fund (SRF) Loan Program's Bidder's Requirements for Solicitation and Documentation of DBE Participation, found in Section 00801, SRF Contract Requirements.

No mathematical errors were found in either Bid Proposal.

The following issues were found during the review of Revere Control Systems' bid. CDM Smith requested and received satisfactory supporting information for these two items via e-mail from Revere Control Systems.

1. The amount entered for Bid Item B (Mobilization and Demobilization) was $309,996, which represents 15.9 percent of the Total Bid. However, per Specification Section 01025 (Measurement and Payment), Paragraph 3.01A.2, the amount of this Bid Item shall be not more than 5 percent of the Total Bid.

   Revere Control Systems responded that the amount for Bid Item B should be reduced from $309,996 to $97,649, which is approximately 5 percent of the Total Bid. Revere Control Systems also requested that the amount for Bid Item A (all work under the Bidding Documents, exclusive of Base Bid Items B through E) be increased to $1,277,437 so that the Total Bid Price remains the same at $1,949,980.

   These proposed changes to Bid Items A and B are acceptable to the City. The amounts of these bid items will be adjusted after the contract has been signed.

2. The amount entered for Bid Item C (Bonds and Insurance) was $16,258, which makes up 0.83 percent of the Total Bid. In CDM Smith's experience, the amount entered for bonds and insurance has typically represented a higher percentage (2 to 3 percent) of the Total Bid.

   Revere Control Systems stated that this amount includes the costs for the Performance and Payment Bonds, and confirmed that the specified insurance requirements and coverage limits will be met with no change to the Total Bid amount. The City is satisfied with this response.

Accordingly, CDM Smith recommends that the City of Franklin award a construction contract to the lowest, responsive, responsible, qualified bidder, Revere Control Systems Inc., of Birmingham, Alabama, the Water Management Department Water Distribution & Collection System SCADA Improvements project in the amount of $1,949,980.

Enclosed along with this letter and the copies of the Bid Tabulation are the original bid packages, which we are returning to you. If you have any questions or comments, or if you require any additional information, please do not hesitate to contact this office.

Sincerely,

Robert P. Huguenard, P.E., BCEE
Senior Project Manager
CDM Smith Inc.

cc: Patricia McNeese – City of Franklin Engineering Department
Project File (14915-96594-SCADA)

Attachments & Enclosures

BID TABULATION SHEET

PREPARED BY CDM SMITH INC.
3715 NORTHSIDE PARKWAY NW, BLDG. 300, STE. 400
ATLANTA, GEORGIA 30327

CITY OF FRANKLIN

WATER MANAGEMENT DEPARTMENT
WATER DISTRIBUTION AND COLLECTION SYSTEM
SCADA IMPROVEMENTS
COF CONTRACT NO. 2014-0288

BID OPENING:
AUGUST 9, 2016
2:00 P.M. LOCAL TIME

CERTIFIED AS CORRECT: Carol D. Carl DATE: 8/18/16

BIDDERS:				Revere Control Systems Inc. 2240 Rocky Ridge Road Birmingham, Alabama 35216 (205) 824-0004		PowerTek LLC 1865 Air Lane Drive, Suite 12 Nashville, Tennessee 37210 (615) 777-4040	
Item No.	Item Description	Estimated Quantity	Units	Unit Price in Figures	Total Price in Figures	Unit Price in Figures	Total Price in Figures
PART 1 - BASE BID							
A	All work under the Bidding Documents, complete as indicated on the Drawings and Specifications, exclusive of Base Bid Items B through E listed below	LS	LS	$ 1,065,089.00	$ 1,065,089.00	$ 1,541,500.00	$ 1,541,500.00
B	Mobilization and Demobilization: For all costs associated with project mobilization and demobilization in accordance with the Drawings and Specifications	LS	LS	$ 309,996.00	$ 309,996.00	$ 41,313.00	$ 41,313.00
C	Bonds and Insurance	LS	LS	$ 16,258.00	$ 16,258.00	$ 62,479.00	$ 62,479.00
D	Master Station: All work associated with furnishing and installation of a Master Remote Telemetry Unit (RTU) at the City of Franklin Public Works Building property	LS	LS	$ 158,637.00	$ 158,637.00	$ 53,030.00	$ 53,030.00
E	Owner's Contingency	N/A	N/A	$ 400,000.00	$ 400,000.00	$ 400,000.00	$ 400,000.00
	TOTAL, PART 1 - BASE BID (Items A through E)				**$ 1,949,980.00**		**$ 2,098,322.00**
PART 2 - BID SUMMARY							
	TOTAL PART 1 - BASE BID				**$ 1,949,980.00**		**$ 2,098,322.00**
	TOTAL BID				**$ 1,949,980.00**		**$ 2,098,322.00**

RESOLUTION 2016-58

A RESOLUTION AUTHORIZING CITY OF FRANKLIN CONTRACT 2016-0265 WITH THE STATE OF TENNESSEE RELATED TO THE CLEAN TENNESSEE ENERGY GRANT IN THE AMOUNT OF $250,000

WHEREAS, the City of Franklin (City) has contracted with CDM Smith, to perform design services for the upgrade and expansion project at the Water Reclamation Facility for both liquids and biosolids processes (COF Contract No. 2013-0001); and

WHEREAS, the design for the treatment systems focus on environmentally sustainable practices; and

WHEREAS, the City has applied for and is being offered a grant through the Tennessee Clean Energy Grant Program in the amount of $250,000 to help fund a component of the biosolids project (City of Franklin Contract 2016-0265).

NOW, THEREFORE, BE IT RESOLVED, by the Board of Mayor and Aldermen for the City of Franklin, Tennessee, as follows:

Section 1, that approval is granted to enter into Contract 2016-0265 with the State of Tennessee to receive grant monies under the Clean Tennessee Energy Grant Program.

Section 2, the Mayor, City Administrator, or designee shall have the authority to execute documents related to the grant, as necessary.

IT IS SO RESOLVED AND DONE on this ____ day of _____, 2016.

ATTEST:

BY: _____

ERIC S. STUCKEY
City Administrator

CITY OF FRANKLIN, TENNESSEE:

BY: _____

DR. KEN MOORE
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

Law Dept. approved 08.30.16

GOVERNMENTAL GRANT CONTRACT

(cost reimbursement grant contract with a federal or Tennessee local governmental entity or their agents and instrumentalities)

Begin Date	End Date	Agency Tracking #	Edison ID
9/1/2016	8/31/2018	32701-02803	PO_____

Grantee Legal Entity Name	Edison Vendor ID
City of Franklin	0000001552

Subrecipient or Contractor	CFDA #
☒ Subrecipient ☐ Contractor	Grantee's fiscal year end June 30th

Service Caption (one line only)

Clean Tennessee Energy Grant Program

Funding —

FY	State	Federal	Interdepartmental	Other	TOTAL Grant Contract Amount
2017			$250,000.00		$250,000.00
TOTAL:			**$250,000.00**		**$250,000.00**

Grantee Selection Process Summary

☒ Competitive Selection	Applications were solicited from Tennessee local governmental entities and were evaluated and grant amounts determined according to the following criteria: • energy efficiency, • air quality improvements, • general public benefit, • protection of environmental resources, and • creativity/new technology.
☐ Non-competitive Selection	

Budget Officer Confirmation: There is a balance in the appropriation from which obligations hereunder are required to be paid that is not already encumbered to pay other obligations.

Thomas W. Ehn

Speed Chart (optional)	Account Code (optional)
EN00017611	71302000

CPO USE – GG

Edison ID 49288

327.31

GRANT CONTRACT
BETWEEN THE STATE OF TENNESSEE,
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
AND
CITY OF FRANKLIN

This grant contract ("Grant Contract"), by and between the State of Tennessee, Department of Environment and Conservation, hereinafter referred to as the "State" or the "Grantor State Agency" and City of Franklin, hereinafter referred to as the "Grantee," is for the provision of Clean Tennessee Energy Grant Program services, as further defined in the "SCOPE OF SERVICES AND DELIVERABLES."

Grantee Edison Vendor ID # 0000001552

A. SCOPE OF SERVICES AND DELIVERABLES:

A.1. The Grantee shall provide the scope of services and deliverables ("Scope") as required, described, and detailed in this Grant Contract.

A.2. The grantee shall purchase, install and construct an environmental energy project that shall result in the reduction of emissions and pollutants as described in the Grantee's application.

A.3. Cleaner Alternative Energy improvements may include projects to generate energy using biomass, geothermal, solar, and wind.

A.4. Energy Conservation improvements may include lighting; heating, ventilation, and air conditioning (HVAC); improved fuel efficiency; insulation; and idling minimization.

A.5. Air Quality Improvement may include projects to reduce greenhouse gas (GHG), sulfur dioxide (SO_2), volatile organic compounds (VOC), nitrogen oxide (NO_X), and hazardous air pollutants (HAP).

A.6. The Grantee shall obtain all required permits prior to commencing work on the project.

A.7. The Grantee shall provide the State with reports on the results of the project for five (5) years after implementation. The Grantee expressly understands and agrees that the obligations set forth in this section shall survive the termination of this grant.

A.8. The Grantee shall comply with the International Energy Conservation Code (2006 edition to present). This code is founded on principles intended to establish provisions consistent with the scope of an energy conservation code that adequately conserves energy; provisions that do not unnecessarily increase construction costs; provisions that do not restrict the use of new materials, products or methods of construction; and provisions that do not give preferential treatment to particular types of classes of materials, products or methods of construction.

A.9. The Grantee shall enroll and engage in the Environmental Protection Agency's ENERGY STAR Portfolio Manager. The ENERGY STAR portfolio manager is an online tool that one can use to measure and track energy and water consumption as well as greenhouse gas emissions.

A.10. Incorporation of Additional Documents. Each of the following documents is included as a part of this Grant Contract by reference or attachment. In the event of a discrepancy or ambiguity regarding the Grantee's duties, responsibilities, and performance hereunder, these items shall govern in order of precedence below.

a. this Grant Contract document with any attachments or exhibits (excluding the items listed at subsections b. and c., below);

b. the State grant proposal solicitation as may be amended, if any;

c. the Grantee's proposal (Attachment 1) incorporated to elaborate supplementary scope of services specifications.

B. TERM OF CONTRACT:

This Grant Contract shall be effective on September 1, 2016 ("Effective Date") and extend for a period of twenty-four (24) months after the Effective Date ("Term"). The State shall have no obligation to the Grantee for fulfillment of the Scope outside the Term.

C. PAYMENT TERMS AND CONDITIONS:

C.1. Maximum Liability. In no event shall the maximum liability of the State under this Grant Contract exceed Two Hundred Fifty Thousand Dollars ($250,000.00) ("Maximum Liability"). The Grant Budget, attached and incorporated as Attachment 2 is the maximum amount due the Grantee under this Grant Contract. The Grant Budget line-items include, but are not limited to, all applicable taxes, fees, overhead, and all other direct and indirect costs incurred or to be incurred by the Grantee.

C.2. Compensation Firm. The Maximum Liability of the State is not subject to escalation for any reason unless amended. The Grant Budget amounts are firm for the duration of the Grant Contract and are not subject to escalation for any reason unless amended, except as provided in Section C.6.

C.3. Payment Methodology. The Grantee shall be reimbursed for actual, reasonable, and necessary costs based upon the Grant Budget, not to exceed the Maximum Liability established in Section C.1. Upon progress toward the completion of the Scope, as described in Section A of this Grant Contract, the Grantee shall submit invoices prior to any reimbursement of allowable costs.

C.4. Travel Compensation. Reimbursement to the Grantee for travel, meals, or lodging shall be subject to amounts and limitations specified in the "State Comprehensive Travel Regulations," as they are amended from time to time, and shall be contingent upon and limited by the Grant Budget funding for said reimbursement.

C.5. Invoice Requirements. The Grantee shall invoice the State no more often than monthly, with all necessary supporting documentation, and present such to:

Department of Environment and Conservation
Office of Sustainable Practices
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Ave., 2nd Floor
Nashville, TN 37243

a. Each invoice shall clearly and accurately detail all of the following required information (calculations must be extended and totaled correctly).

(1) Invoice/Reference Number (assigned by the Grantee).
(2) Invoice Date.
(3) Invoice Period (to which the reimbursement request is applicable).
(4) Grant Contract Number (assigned by the State).
(5) Grantor: Department of Environment and Conservation, Office of Sustainable Practices.
(6) Grantor Number (assigned by the Grantee to the above-referenced Grantor).
(7) Grantee Name.

(8) Grantee Tennessee Edison Registration ID Number Referenced in Preamble of this Grant Contract.
(9) Grantee Remittance Address.
(10) Grantee Contact for Invoice Questions (name, phone, or fax).
(11) Itemization of Reimbursement Requested for the Invoice Period— it must detail, at minimum, all of the following:

i. The amount requested by Grant Budget line-item (including any travel expenditure reimbursement requested and for which documentation and receipts, as required by "State Comprehensive Travel Regulations," are attached to the invoice).
ii. The amount reimbursed by Grant Budget line-item to date.
iii. The total amount reimbursed under the Grant Contract to date.
iv. The total amount requested (all line-items) for the Invoice Period.

b. The Grantee understands and agrees to all of the following.

(1) An invoice under this Grant Contract shall include only reimbursement requests for actual, reasonable, and necessary expenditures required in the delivery of service described by this Grant Contract and shall be subject to the Grant Budget and any other provision of this Grant Contract relating to allowable reimbursements.
(2) An invoice under this Grant Contract shall not include any reimbursement request for future expenditures.
(3) An invoice under this Grant Contract shall initiate the timeframe for reimbursement only when the State is in receipt of the invoice, and the invoice meets the minimum requirements of this section C.5.

C.6. Budget Line-items. Expenditures, reimbursements, and payments under this Grant Contract shall adhere to the Grant Budget. The Grantee may vary from a Grant Budget line-item amount by up to twenty percent (20%) of the line-item amount, provided that any increase is off-set by an equal reduction of other line-item amount(s) such that the net result of variances shall not increase the total Grant Contract amount detailed by the Grant Budget. Any increase in the Grant Budget, grand total amounts shall require an amendment of this Grant Contract.

C.7. Disbursement Reconciliation and Close Out. The Grantee shall submit any final invoice and a grant disbursement reconciliation report within sixty (60) days of the Grant Contract end date and in form and substance acceptable to the State.

a. The Grant Budget specifies a Grantee Match Requirement and the final grant disbursement reconciliation report shall detail all Grantee expenditures recorded to meet this requirement.

i. No Grantee expenditure shall be recorded and reported toward meeting a Grantee Match Requirement of more than one grant contract with the State.

ii. The final grant disbursement reconciliation report shall specifically detail the exact amount of any Grantee failure to meet a Match Requirement, and the maximum total amount reimbursable by the State pursuant to this Grant Contract, as detailed by the Grant Budget column "Grant Contract," shall be reduced by the amount that the Grantee failed to contribute to the Total Project as budgeted.

b. If total disbursements by the State pursuant to this Grant Contract exceed the amounts permitted by the section C, payment terms and conditions of this Grant Contract (including any adjustment pursuant to subsection a.ii. above), the Grantee shall refund

the difference to the State. The Grantee shall submit the refund with the final grant disbursement reconciliation report.

c. The State shall not be responsible for the payment of any invoice submitted to the state after the grant disbursement reconciliation report. The State will not deem any Grantee costs submitted for reimbursement after the grant disbursement reconciliation report to be allowable and reimbursable by the State, and such invoices will NOT be paid.

d. The Grantee's failure to provide a final grant disbursement reconciliation report to the state as required shall result in the Grantee being deemed ineligible for reimbursement under this Grant Contract, and the Grantee shall be required to refund any and all payments by the state pursuant to this Grant Contract.

e. The Grantee must close out its accounting records at the end of the contract period in such a way that reimbursable expenditures and revenue collections are NOT carried forward.

C.8. Indirect Cost. Should the Grantee request reimbursement for indirect costs, the Grantee must submit to the State a copy of the indirect cost rate approved by the cognizant federal agency or the cognizant state agency, as applicable. The Grantee will be reimbursed for indirect costs in accordance with the approved indirect cost rate and amounts and limitations specified in the attached Grant Budget. Once the Grantee makes an election and treats a given cost as direct or indirect, it must apply that treatment consistently and may not change during the Term. Any changes in the approved indirect cost rate must have prior approval of the cognizant federal agency or the cognizant state agency, as applicable. If the indirect cost rate is provisional during the Term, once the rate becomes final, the Grantee agrees to remit any overpayment of funds to the State, and subject to the availability of funds the State agrees to remit any underpayment to the Grantee.

C.9. Cost Allocation. If any part of the costs to be reimbursed under this Grant Contract are joint costs involving allocation to more than one program or activity, such costs shall be allocated and reported in accordance with the provisions of Department of Finance and Administration Policy Statement 03 or any amendments or revisions made to this policy statement during the Term.

C.10. Payment of Invoice. A payment by the State shall not prejudice the State's right to object to or question any reimbursement, invoice, or related matter. A payment by the State shall not be construed as acceptance of any part of the work or service provided or as approval of any amount as an allowable cost.

C.11. Non-allowable Costs. Any amounts payable to the Grantee shall be subject to reduction for amounts included in any invoice or payment that are determined by the State, on the basis of audits or monitoring conducted in accordance with the terms of this Grant Contract, to constitute unallowable costs.

C.12. State's Right to Set Off. The State reserves the right to set off or deduct from amounts that are or shall become due and payable to the Grantee under this Grant Contract or under any other agreement between the Grantee and the State of Tennessee under which the Grantee has a right to receive payment from the State.

C.13. Prerequisite Documentation. The Grantee shall not invoice the State under this Grant Contract until the State has received the following, properly completed documentation.

a. The Grantee shall complete, sign, and return to the State an "Authorization Agreement for Automatic Deposit (ACH Credits) Form" provided by the State. By doing so, the Grantee acknowledges and agrees that, once this form is received by the State, all

payments to the Grantee under this or any other grant contract will be made by automated clearing house ("ACH").

b. The Grantee shall complete, sign, and return to the State the State-provided W-9 form. The taxpayer identification number on the W-9 form must be the same as the Grantee's Federal Employer Identification Number or Social Security Number referenced in the Grantee's Edison registration information.

D. STANDARD TERMS AND CONDITIONS:

D.1. Required Approvals. The State is not bound by this Grant Contract until it is signed by the parties and approved by appropriate officials in accordance with applicable Tennessee laws and regulations (depending upon the specifics of this Grant Contract, the officials may include, but are not limited to, the Commissioner of Finance and Administration, the Commissioner of Human Resources, and the Comptroller of the Treasury).

D.2. Modification and Amendment. This Grant Contract may be modified only by a written amendment signed by all parties and approved by the officials who approved the Grant Contract and, depending upon the specifics of the Grant Contract as amended, any additional officials required by Tennessee laws and regulations (the officials may include, but are not limited to, the Commissioner of Finance and Administration, the Commissioner of Human Resources, and the Comptroller of the Treasury).

D.3. Termination for Convenience. The State may terminate this Grant Contract without cause for any reason. A termination for convenience shall not be a breach of this Grant Contract by the State. The State shall give the Grantee at least thirty (30) days written notice before the effective termination date. The Grantee shall be entitled to compensation for authorized expenditures and satisfactory services completed as of the termination date, but in no event shall the State be liable to the Grantee for compensation for any service that has not been rendered. The final decision as to the amount for which the State is liable shall be determined by the State. The Grantee shall not have any right to any actual general, special, incidental, consequential, or any other damages whatsoever of any description or amount for the State's exercise of its right to terminate for convenience.

D.4. Termination for Cause. If the Grantee fails to properly perform its obligations under this Grant Contract, or if the Grantee violates any terms of this Grant Contract, the State shall have the right to immediately terminate this Grant Contract and withhold payments in excess of fair compensation for completed services. Notwithstanding the exercise of the State's right to terminate this Grant Contract for cause, the Grantee shall not be relieved of liability to the State for damages sustained by virtue of any breach of this Grant Contract by the Grantee.

D.5. Subcontracting. The Grantee shall not assign this Grant Contract or enter into a subcontract for any of the services performed under this Grant Contract without obtaining the prior written approval of the State. If such subcontracts are approved by the State, each shall contain, at a minimum, sections of this Grant Contract pertaining to "Conflicts of Interest," "Lobbying," "Nondiscrimination," "Public Accountability," "Public Notice," and "Records" (as identified by the section headings). Notwithstanding any use of approved subcontractors, the Grantee shall remain responsible for all work performed.

D.6. Conflicts of Interest. The Grantee warrants that no part of the total Grant Contract Amount shall be paid directly or indirectly to an employee or official of the State of Tennessee as wages, compensation, or gifts in exchange for acting as an officer, agent, employee, subcontractor, or consultant to the Grantee in connection with any work contemplated or performed relative to this Grant Contract.

D.7. Lobbying. The Grantee certifies, to the best of its knowledge and belief, that:

a. No federally appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.

b. If any funds other than federally appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this contract, grant, loan, or cooperative agreement, the Grantee shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

c. The Grantee shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into and is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. § 1352.

D.8. Communications and Contacts. All instructions, notices, consents, demands, or other communications required or contemplated by this Grant Contract shall be in writing and shall be made by certified, first class mail, return receipt requested and postage prepaid, by overnight courier service with an asset tracking system, or by email or facsimile transmission with recipient confirmation. All communications, regardless of method of transmission, shall be addressed to the respective party as set out below:

The State:

Kathy Glapa, Office of Sustainable Practices
Department of Environment and Conservation
William R. Snodgrass Tennessee Tower, 2nd Floor
312 Rosa L. Parks Blvd
Nashville, Tennessee 37243
kathy.glapa@tn.gov
Telephone#: (615) 253-8780
FAX#:(615) 532-0199

The Grantee:

Mark Hilty, Water Management Director
124 Lumber Drive
Franklin, TN 37064
mark.hilty@franklintn.gov
Telephone # 615-794-4554
FAX # 615-790-1340

A change to the above contact information requires written notice to the person designated by the other party to receive notice.

All instructions, notices, consents, demands, or other communications shall be considered effectively given upon receipt or recipient confirmation as may be required.

D.9. Subject to Funds Availability. This Grant Contract is subject to the appropriation and availability of State or Federal funds. In the event that the funds are not appropriated or are otherwise unavailable, the State reserves the right to terminate this Grant Contract upon written notice to the Grantee. The State's right to terminate this Grant Contract due to lack of funds is not a breach of this Grant Contract by the State. Upon receipt of the written notice, the Grantee shall cease all work associated with the Grant Contract. Should such an event occur, the Grantee shall be entitled to compensation for all satisfactory and authorized services completed as of the termination date. Upon such termination, the Grantee shall have no right to recover from the State any actual, general, special, incidental, consequential, or any other damages whatsoever of any description or amount.

D.10. Nondiscrimination. The Grantee hereby agrees, warrants, and assures that no person shall be excluded from participation in, be denied benefits of, or be otherwise subjected to discrimination in the performance of this Grant Contract or in the employment practices of the Grantee on the grounds of handicap or disability, age, race, color, religion, sex, national origin, or any other classification protected by federal, Tennessee state constitutional, or statutory law. The Grantee shall, upon request, show proof of nondiscrimination and shall post in conspicuous places, available to all employees and applicants, notices of nondiscrimination.

D.11. HIPAA Compliance. The State and the Grantee shall comply with obligations under the Health Insurance Portability and Accountability Act of 1996 (HIPAA), Health Information Technology for Economic and Clinical Health Act (HITECH) and any other relevant laws and regulations regarding privacy (collectively the "Privacy Rules"). The obligations set forth in this Section shall survive the termination of this Grant Contract.

a. The Grantee warrants to the State that it is familiar with the requirements of the Privacy Rules and will comply with all applicable HIPAA requirements in the course of this Grant Contract.

b. The Grantee warrants that it will cooperate with the State, including cooperation and coordination with State privacy officials and other compliance officers required by the Privacy Rules, in the course of performance of this Grant Contract so that both parties will be in compliance with the Privacy Rules.

c. The State and the Grantee will sign documents, including but not limited to business associate agreements, as required by the Privacy Rules and that are reasonably necessary to keep the State and the Grantee in compliance with the Privacy Rules. This provision shall not apply if information received by the State under this Grant Contract is NOT "protected health information" as defined by the Privacy Rules, or if the Privacy Rules permit the State to receive such information without entering into a business associate agreement or signing another such document.

D.12. Public Accountability. If the Grantee is subject to Tenn. Code Ann. § 8-4-401 *et seq.*, or if this Grant Contract involves the provision of services to citizens by the Grantee on behalf of the State, the Grantee agrees to establish a system through which recipients of services may present grievances about the operation of the service program. The Grantee shall also display in a prominent place, located near the passageway through which the public enters in order to receive Grant supported services, a sign at least eleven inches (11") in height and seventeen inches (17") in width stating:

NOTICE: THIS AGENCY IS A RECIPIENT OF TAXPAYER FUNDING. IF YOU OBSERVE AN AGENCY DIRECTOR OR EMPLOYEE ENGAGING IN ANY ACTIVITY WHICH YOU CONSIDER TO BE ILLEGAL, IMPROPER, OR WASTEFUL, PLEASE CALL THE STATE COMPTROLLER'S TOLL-FREE HOTLINE: 1-800-232-5454.

The sign shall be on the form prescribed by the Comptroller of the Treasury. The Grantor State Agency shall obtain copies of the sign from the Comptroller of the Treasury, and upon request from the Grantee, provide Grantee with any necessary signs.

D.13. Public Notice. All notices, informational pamphlets, press releases, research reports, signs, and similar public notices prepared and released by the Grantee in relation to this Grant Contract shall include the statement, "This project is funded under a grant contract with the State of Tennessee." All notices by the Grantee in relation to this Grant Contract shall be approved by the State.

D.14. Licensure. The Grantee, its employees, and any approved subcontractor shall be licensed pursuant to all applicable federal, state, and local laws, ordinances, rules, and regulations and shall upon request provide proof of all licenses.

D.15. Records. The Grantee and any approved subcontractor shall maintain documentation for all charges under this Grant Contract. The books, records, and documents of the Grantee and any approved subcontractor, insofar as they relate to work performed or money received under this Grant Contract, shall be maintained in accordance with applicable Tennessee law. In no case shall the records be maintained for a period of less than five (5) full years from the date of the final payment. The Grantee's records shall be subject to audit at any reasonable time and upon reasonable notice by the Grantor State Agency, the Comptroller of the Treasury, or their duly appointed representatives.

The records shall be maintained in accordance with Governmental Accounting Standards Board (GASB) Accounting Standards or the Financial Accounting Standards Board (FASB) Accounting Standards Codification, as applicable, and any related AICPA Industry Audit and Accounting guides.

In addition, documentation of grant applications, budgets, reports, awards, and expenditures will be maintained in accordance with U.S. Office of Management and Budget's *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards*.

Grant expenditures shall be made in accordance with local government purchasing policies and procedures and purchasing procedures for local governments authorized under state law.

The Grantee shall also comply with any recordkeeping and reporting requirements prescribed by the Tennessee Comptroller of the Treasury.

The Grantee shall establish a system of internal controls that utilize the COSO Internal Control - Integrated Framework model as the basic foundation for the internal control system. The Grantee shall incorporate any additional Comptroller of the Treasury directives into its internal control system.

Any other required records or reports which are not contemplated in the above standards shall follow the format designated by the head of the Grantor State Agency, the Central Procurement Office, or the Commissioner of Finance and Administration of the State of Tennessee.

D.16. Monitoring. The Grantee's activities conducted and records maintained pursuant to this Grant Contract shall be subject to monitoring and evaluation by the State, the Comptroller of the Treasury, or their duly appointed representatives.

D.17. Progress Reports. The Grantee shall submit brief, periodic, progress reports to the State as requested.

D.18. Annual and Final Reports. The Grantee shall submit, within three (3) months of the conclusion of each year of the Term, an annual report. For grant contracts with a term of less than one (1) year, the Grantee shall submit a final report within three (3) months of the conclusion of the Term. For grant contracts with multiyear terms, the final report will take the place of the annual report for the final year of the Term. The Grantee shall submit annual and final reports to the Grantor State Agency and the Department of Finance and Administration ("F&A"). Send electronic copies of annual and final reports to F&A at fa.audit@tn.gov. At minimum, annual and final reports shall include: (a) the Grantee's name; (b) the Grant Contract's Edison identification number, Term, and total amount; (c) a narrative section that describes the program's goals, outcomes, successes and setbacks, whether the Grantee used benchmarks or indicators to determine progress, and whether any proposed activities were not completed; and (d) other relevant details requested by the Grantor State Agency. Annual and final report documents to be completed by the Grantee shall appear on the Grantor State Agency's website or as an attachment to the Grant Contract.

D.19. Audit Report. The Grantee shall be audited in accordance with applicable Tennessee law.

If the Grantee is subject to an audit under this provision, then the Grantee shall complete Attachment 3.

When a federal single audit is required, the audit shall be performed in accordance with U.S. Office of Management and Budget's *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards*.

A copy of the audit report shall be provided to the Comptroller by the licensed, independent public accountant. Audit reports shall be made available to the public.

D.20. Procurement. If other terms of this Grant Contract allow reimbursement for the cost of goods, materials, supplies, equipment, motor vehicles, or contracted services, procurements by the Grantee shall be competitive where practicable. For any procurement for which reimbursement is paid under this Grant Contract, the Grantee shall document the competitive procurement method. In each instance where it is determined that use of a competitive procurement method is not practicable, supporting documentation shall include a written justification for the decision and for the use of a non-competitive procurement. If the Grantee is a subrecipient, the Grantee shall comply with 2 C.F.R. §§ 200.318—200.326 when procuring property and services under a federal award.

The Grantee shall obtain prior approval from the State before purchasing any equipment or motor vehicles under this Grant Contract.

D.21. Strict Performance. Failure by any party to this Grant Contract to insist in any one or more cases upon the strict performance of any of the terms, covenants, conditions, or provisions of this Grant Contract is not a waiver or relinquishment of any term, covenant, condition, or provision. No term or condition of this Grant Contract shall be held to be waived, modified, or deleted except by a written amendment signed by the parties.

D.22. Independent Contractor. The parties shall not act as employees, partners, joint venturers, or associates of one another in the performance of this Grant Contract. The parties acknowledge that they are independent contracting entities and that nothing in this Grant Contract shall be construed to create a principal/agent relationship or to allow either to exercise control or direction over the manner or method by which the other transacts its business affairs or provides its usual services. The employees or agents of one party shall not be deemed or construed to be the employees or agents of the other party for any purpose whatsoever.

D.23. State Liability. The State shall have no liability except as specifically provided in this Grant Contract.

D.24. Force Majeure. "Force Majeure Event" means fire, flood, earthquake, elements of nature or acts of God, wars, riots, civil disorders, rebellions or revolutions, acts of terrorism or any other similar cause beyond the reasonable control of the party except to the extent that the non-performing party is at fault in failing to prevent or causing the default or delay, and provided that the default or delay cannot reasonably be circumvented by the non-performing party through the use of alternate sources, workaround plans or other means. A strike, lockout or labor dispute shall not excuse either party from its obligations under this Grant Contract. Except as set forth in this Section, any failure or delay by a party in the performance of its obligations under this Grant Contract arising from a Force Majeure Event is not a default under this Grant Contract or grounds for termination. The non-performing party will be excused from performing those obligations directly affected by the Force Majeure Event, and only for as long as the Force Majeure Event continues, provided that the party continues to use diligent, good faith efforts to resume performance without delay. The occurrence of a Force Majeure Event affecting Grantee's representatives, suppliers, subcontractors, customers or business apart from this Grant Contract is not a Force Majeure Event under this Grant Contract. Grantee will promptly notify the State of any delay caused by a Force Majeure Event (to be confirmed in a written notice to the State within one (1) day of the inception of the delay) that a Force Majeure Event has occurred, and will describe in reasonable detail the nature of the Force Majeure Event. If any Force Majeure Event results in a delay in Grantee's performance longer than forty-eight (48) hours, the State may, upon notice to Grantee: (a) cease payment of the fees until Grantee resumes performance of the affected obligations; or (b) immediately terminate this Grant Contract or any purchase order, in whole or in part, without further payment except for fees then due and payable. Grantee will not increase its charges under this Grant Contract or charge the State any fees other than those provided for in this Grant Contract as the result of a Force Majeure Event.

D.25. Tennessee Department of Revenue Registration. The Grantee shall comply with all applicable registration requirements contained in Tenn. Code Ann. §§ 67-6-601 – 608. Compliance with applicable registration requirements is a material requirement of this Grant Contract.

D.26. Charges to Service Recipients Prohibited. The Grantee shall not collect any amount in the form of fees or reimbursements from the recipients of any service provided pursuant to this Grant Contract.

D.27. Reserved.

D.28. State and Federal Compliance. The Grantee shall comply with all applicable state and federal laws and regulations in the performance of this Grant Contract. The U.S. Office of Management and Budget's Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards is available here: http://www.ecfr.gov/cgi-bin/text-idx?SID=c6b2f053952359ba94470ad3a7c1a975&tpl=/ecfrbrowse/Title02/2cfr200_main_02.tpl

D.29. Governing Law. This Grant Contract shall be governed by and construed in accordance with the laws of the State of Tennessee. The Grantee agrees that it will be subject to the exclusive jurisdiction of the courts of the State of Tennessee in actions that may arise under this Grant Contract. The Grantee acknowledges and agrees that any rights or claims against the State of Tennessee or its employees hereunder, and any remedies arising there from, shall be subject to and limited to those rights and remedies, if any, available under Tenn. Code Ann. §§ 9-8-101 through 9-8-407.

D.30. Completeness. This Grant Contract is complete and contains the entire understanding between the parties relating to the subject matter contained herein, including all the terms and conditions agreed to by the parties. This Grant Contract supersedes any and all prior understandings, representations, negotiations, or agreements between the parties, whether written or oral.

D.31. Severability. If any terms and conditions of this Grant Contract are held to be invalid or unenforceable as a matter of law, the other terms and conditions shall not be affected and shall

remain in full force and effect. To this end, the terms and conditions of this Grant Contract are declared severable.

D.32. Headings. Section headings are for reference purposes only and shall not be construed as part of this Grant Contract.

E. SPECIAL TERMS AND CONDITIONS:

E.1. Conflicting Terms and Conditions. Should any of these special terms and conditions conflict with any other terms and conditions of this Grant Contract, the special terms and conditions shall be subordinate to the Grant Contract's other terms and conditions.

IN WITNESS WHEREOF,

CITY OF FRANKLIN:

_____

GRANTEE SIGNATURE **DATE**

_____

PRINTED NAME AND TITLE OF GRANTEE SIGNATORY (above)

DEPARTMENT OF ENVIRONMENT AND CONSERVATION:

_____

ROBERT J. MARTINEAU, JR., COMMISSIONER **DATE**

APPROVED AS TO FORM

By:_____

Title:_____

ATTACHMENT 2

GRANT BUDGET				
Clean Tennessee Energy Grant Program				
The Grant Budget line-item amounts below shall be applicable only to expense incurred during the following Applicable Period: BEGIN: 9/1/2016 END: 8/31/2018				
POLICY 03 Object Line-item Reference	EXPENSE OBJECT LINE-ITEM CATEGORY [1]	GRANT CONTRACT	GRANTEE MATCH[3]	TOTAL PROJECT
1. 2	Salaries, Benefits & Taxes	0.00	0.00	0.00
4, 15	Professional Fee, Grant & Award [2]	0.00	0.00	0.00
5, 6, 7, 8, 9, 10	Supplies, Telephone, Postage & Shipping, Occupancy, Equipment Rental & Maintenance, Printing & Publications	0.00	0.00	0.00
11. 12	Travel, Conferences & Meetings	0.00	0.00	0.00
13	Interest [2]	0.00	0.00	0.00
14	Insurance	0.00	0.00	0.00
16	Specific Assistance To Individuals	0.00	0.00	0.00
17	Depreciation [2]	0.00	0.00	0.00
18	Other Non-Personnel [2]	0.00	0.00	0.00
20	Capital Purchase [2]	$250,000.00	$1,363,170.00	$1,613,170.00
22	Indirect Cost	0.00	0.00	0.00
24	In-Kind Expense	0.00	0.00	0.00
25	**GRAND TOTAL**	**$250,000.00**	**$1,363,170.00**	**$1,613,170.00**

[1] Each expense object line-item shall be defined by the Department of Finance and Administration Policy 03, *Uniform Reporting Requirements and Cost Allocation Plans for Subrecipients of Federal and State Grant Monies, Appendix A*. (posted on the Internet at: http://www.state.tn.us/finance/act/documents/policy3.pdf).

[2] Applicable detail follows this page if line-item is funded.

[3] A Grantee Match Requirement is detailed by this Grant Budget, and the maximum total amount reimbursable by the State pursuant to this Grant Contract, as detailed by the "Grant Contract" column above, shall be reduced by the amount of any Grantee failure to meet the Match Requirement.

ATTACHMENT 2

GRANT BUDGET LINE-ITEM DETAIL:

CAPITAL PURCHASE	AMOUNT
Biogas, Combined Heat and Power system to generate electricity and heat for use with the biosolids management processes.	$1,613,170.00
TOTAL	$1,613,170.00

ATTACHMENT 3

Parent Child Information

The Grantee should complete this form and submit it with the Grant Contract. The Grantee should submit only one, completed "Parent Child Information" document to the State during the Grantee's fiscal year.

"Parent" means an entity whose IRS filing contains the information of at least one other entity.

"Child" means an entity whose information is contained in another entity's IRS filing.

Grantee's Edison Vendor ID number:

Is Grantee Legal Entity Name a parent? Yes ☐ No ☐

If yes, provide the name and Edison Vendor ID number, if applicable, of any child entities.

Is Grantee Legal Entity Name a child? Yes ☐ No ☐

If yes, complete the fields below.

Parent entity's name: _____

Parent entity's tax identification number: _____

Note: If the parent entity's tax identification number is a social security number, this form must be submitted via US mail to:

Central Procurement Office, Grants Program Manager
3rd Floor, WRS Tennessee Tower
312 Rosa L Parks Avenue
Nashville, TN 37243

Parent entity's contact information

Name of primary contact person: _____

Address: _____

Phone number: _____

Email address: _____

Parent entity's Edison Vendor ID number, if applicable: _____

ATTACHMENT 1

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
William R Snodgrass Tennessee Tower – Office of Sustainable Practices
312 Rosa L Parks Ave, 2nd Floor, Nashville, TN 37243
EMAIL: Green.Initiatives@tn.gov

Clean Tennessee Energy Grant Program Application

(Limit one application per entity, per location)

To be considered, applications must be submitted no later than January 29, 2016.

Participant Information | **Please provide a description in the text boxes below for each section**

Applicant Name *(Organization that will enter into the Grant Agreement)*: City of Franklin

Applicant is a:

A. Municipal Government ✓
B. County Government
C. Utility District
D. Other Entities created by statute

List of Project Partners (if any): CDM Smith

List County/Counties location: Williamson

Applicant Address: 124 Lumber Drive
City: Franklin Zip Code(9-Digit): 37064 3957

Project Location Address: 135 Claude Yates Drive
City: Franklin Zip Code(9-Digit): 37064 2085

Applicant Contact (Person responsible for daily management of project):

Name: Mark Hilty
Telephone: 615 -794 -4554
Title: Water Management Director
Federal ID: 62-6000290
E-Mail: mark.hilty@franklintn.gov

Project Title: Franklin Water Reclamation Facility Biosolids Improvements Project

Project Categories

Cleaner Alternative Energy:
Biomass
Geothermal
Solar
Wind
Other: Biogas Combined Heat and Power

Air Quality Improvement/Reduction
GHG
SO_2
VOCs
NO_x
HAPs
Other:

Energy Conservation:
Lighting
HVAC Improvements
Improved fuel efficiency
Insulation
Idling Minimization
Other:

Brief Project Description *(No more than 500 characters)*:

Franklin is upgrading its biosolids processes. Various components utilize emerging technologies to promote energy efficiency, cost reductions, and beneficial reuse of solids. Technologies include thermal hydrolysis, anaerobic digestion, solar drying of Class A biosolids, and a biogas combined heat and power (CHP) system. Sustainability and efficiency are ingrained in the scope of the project. Due to the significant scope, the application and budget form presents only the CHP component.

Project Funding

Grant Amount Requested:	$250,000	15.5%
Match:	$1,363,170	84.5%
TOTAL PROJECT COST	$1,613,170	100%

Source & Amount of Applicant's Matching Funds

General Fund:	$1,363,170
In-kind Services:	$0
TOTAL MATCH	$1,363,170

(TOTAL MATCH should equal match in project funding section)

received 3/23/16 HW

Continued on Page 2

Grantee Information (Person responsible for communications and contact):

Name:	Mark Hilty	Address:	124 Lumber Drive, Franklin, TN 37064
Title:	Water Management Director	Telephone:	615 794 4554
E-Mail:	mark.hilty@franklintn.gov	Fax:	615 790 1340

Federal Congressional District

Congressperson's Name: Rep. Marsha Blackburn District Number: Tennessee's 7th Congressional District

State Districts

Senator's Name: Sen. Jack Johnson District Number: Tennessee Senate District 23

Representative's Name: Rep. Charles Sargent District Number: Tennessee House District 61

Signature of Elected Official/Date

3rd Avenue South, Franklin, Tennessee 37064

Mailing Address, City, State, Zip Code

Dr. Ken Moore, Mayor

Printed Name/Title

ken.moore@franklintn.gov

E-Mail

3/18/16

Signature of Project Partner/Date

210 25th Ave N, Nasvhille, TN 37203

Mailing Address, City, State, Zip Code

Zack Daniel

Printed Name/Title

danielza@cdmsmith.com

E-Mail

When you have completed this form print and sign and make a copy for your records and return the original to the following address:

Tennessee Department of Environment and Conservation
Office of Sustainable Practices
Attention: Clean Tennessee Energy Grant
William R Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 2nd Floor
Nashville, TN 37243

Application Procedure:

Applicants must complete and provide the items listed below in their grant request. Details for completing the items below are provided in this grant manual.

- Clean Tennessee Energy Grant Program Application
- Project Proposal (maximum five pages)
  - Selection Criteria
  - Estimate of reductions and or air emissions
- Budget page and Budget justification

ATTACHMENT 1

Kathy Glapa

From: Michelle Hatcher <michelle.hatcher@franklintn.gov>
Sent: Friday, March 18, 2016 4:28 PM
To: Mark Hilty; Kathy Glapa
Cc: Zack Daniel
Subject: RE: Franklin Energy Grant Information

Kathy,

Below is the scheduled timeline for the biosolids portion of theWWTP expansion, to where the CHP engine will be constructed.

Bidding – August 2016
Construction Notice to Proceed – October 2016
Construction Substantial Completion – August 2019
Construction Final Completion – October 2019

Please let me know if you need more detail or any other information, we're working on compiling the other original signatures to send to you in a package also.

Have a great weekend, thank you!

Michelle Hatcher, PE
Assistant Director
Water Management Department
City of Franklin
124 Lumber Drive
Franklin, TN 37064
O (615) 794 – 4554
F (615) 790 - 1340

City of Franklin
Water Reclamation Facility, Biosolids Improvements Project

1. Introduction

In 2010, the City of Franklin faced major decisions associated with its water resources systems including expansion of the Water Reclamation Facility (WRF) in order to meet the increasing demands of the wastewater system. The Integrated Water Resources Plan (IWRP), completed by the City in 2012, identified necessary capital improvements and resource management opportunities available to the City to meet its growing needs and future wastewater collection and treatment capacities requirements.

Key findings from the IWRP related to the WRF expansion included upgrades to the biosolids system. The biosolids system was identified as a risk to the overall plant operation due to the current practice of thickening, dewatering and hauling to the Camden, TN landfill. It was recommended to identify process improvements to produce a biosolids residual meeting Class A standards to enable beneficial reuse, long-term sustainability and efficient long-term operations and maintenance cost.

The City is in the process of finalizing design of the proposed biosolids system. The preliminary design report is attached as Appendix A and contains a significant amount of data and information that might be helpful in clarifying the scope of the project.

2. Existing Solids Management System

The WRF's existing biosolids treatment process consists of the following processes; waste activated sludge (WAS) from the secondary clarifiers is thickened in dissolved air flotation (DAF) thickeners before being dewatered by belt filter presses (BFPs) and hauled approximately 108 miles to a landfill for disposal. Because the solids handling equipment requires a high level of maintenance and is nearing the end of its expected service life, the overall system received a poor rating in CDM Smith's condition assessment conducted as part of the IWRP. The existing operation is not sustainable for long-term use due to its production of a non-classified solids that has to be disposed of in a solid waste landfill. The City had as one of its nine goals of the IWRP process the development of a sustainable biosolids process to produce either a Class B or Class A solid that could be beneficially reused.

3. Solids Alternatives

Through the development of the IWRP and through refinements during the preliminary and final design of the Biosolids Improvements Project, the City evaluated various options related to the solids management strategy. These options included the following:

Process Train	*Thickening*	*Digestion*	*Dewatering*	*Drying*	*Disposal*
Alternative 1: *Continue Current Treatment Process*	DAF	None	BFP	None	Haul Dewatered Sludge to Landfill
Alternative 2: *Replace Thickening, Add Digestion & Screw Press Dewatering*	RDT	MAD	BFP/ Screw Press	None	Class B Biosolids for Agricultural Use

Process Train	*Thickening*	*Digestion*	*Dewatering*	*Drying*	*Disposal*
Alternative 3: *Replace Thickening, Add Digestion & Screw Press Dewatering Plus Solar Drying*	RDT	MAD	BFP/ Screw Press	Solar Dryer	Class A Biosolids[1] for Public Use
Alternative 3A: *Replace Thickening, Add Digestion & Screw Press Dewatering Plus Partial Solar Drying*	RDT	MAD	BFP/ Screw Press	Solar Dryer (Partial Installation)	Dried Class A Biosolids[1], Dewatered Class B Biosolids
Alternative 4: *Replace Thickening, Add Digestion & Screw Press Dewatering Plus Solar Drying Plus Thermal Hydrolysis*	None	THP + MAD	Pre-THP: Centrifuge Post-Digestion: BFP	Solar Dryer	Class A Biosolids for Public Use
SELECTED ALTERNATIVE *Alternative 4A:* *Replace Thickening, Add Digestion & Screw Press Dewatering Plus Thermal Hydrolysis Plus Partial Solar Drying*	None	THP + MAD	Pre-THP: Centrifuge; Post-Digestion: BFP	Solar Dryer (Partial Installation)	Dried Class A Biosolids, Dewatered Class A Biosolids

As part of the multi-year IWRP process completed by the City of Franklin, the team utilized a Stella decision-making model to make the most advantageous water resources decisions based on the criteria for both the cost and non-cost factors. As indicated in the biosolids evaluation summary above, the City evaluated each of the options, with Alternative 4a being the chosen alternative for the biosolids facility. This was driven by the City's preference to implement a Class A biosolids alternative to ensure the long-term sustainability and operations and maintenance cost of the system. Although 4a was ranked second in the final analysis, the scores were extremely tight between Alternative 1, 2, 3A and 4A; and ultimately, the ability for 4 to produce a Class A, sustainable product was the final driver for its selection.

4. Proposed Solids Management System

As stated above the proposed solids management system is inclusive of thickening, Mesophilic anaerobic digestion, screw press dewatering, thermal hydrolysis to generate a Class A biosolids, and partial solar drying of Class A solids. Through the development of this alternative, the City is using emerging technologies that focus on long term sustainability, environmental stewardship and efficiency.

Due to the magnitude of the scope of this project and for the purpose of this application, the following sections focus on several key elements of the total scope of the project. Appendix A presents the Preliminary Design Report which provides greater detail with respect to the overall project.

A. Thermal Hydrolysis Process

The thermal hydrolysis process (THP) uses steam to hydrolyze solids before they are fed to the anaerobic digesters. The key objectives for the THP is to generate a Class A solids material, reduce the volume of solids and subsequently the size of the anaerobic digesters (approximately 40%), and to increase the potential for the production of useful biogas.

Thermal hydrolysis technology for use in municipal wastewater operations has been in place in Europe for a number of years however it just now gaining some traction in the United States Markets. CDM Smith, the City's partner with this project, is working through a design build delivery with DC Water at their Blue Plains facility to construct the first THP system in the United States. The system is also the largest CAMBI system in the world.

B. Mesophilic Anaerobic Digestion

The anaerobic digestion facilities will provide volatile solids reduction, which will further reduce the total solids to be disposed of and provide useful renewable energy by providing biogas that can be used as a fuel in the combined heat and power (CHP) system.

Under this project, anaerobic digestion facilities will be provided for 36,000 lb/day of hydrolyzed sludge. This is the projected mass of solids generated in the maximum month when the WWTP flow is 20 mgd. Space will be reserved on the site plan and inside the proposed Digester Building to accommodate solids production for an expanded WWTP treating flows up to 32 mgd.

Fats, oils and grease (FOG) injection is being provided for at the digesters. The purpose for this is to provide additional "fuel" to the digestion process which will result in increased production of biogas.

Biogas generated in the anaerobic digesters provides a source of energy that will be captured and utilized. A key element to utilizing the biogas produced is consideration of gas storage. It is anticipated that there will not be surplus biogas produced with the exception of periods in which the CHP unit is down for maintenance. As a result, the City is not providing for biogas storage facilities at this time.

C. Solar Drying System

Following post-dewatering from the digesters, the dewatered solids will be further dried in solar drying chambers. These large, ventilated greenhouse structures utilize solar radiation and mechanical mixing to produce a dried product with a solids content of 75 percent or more. The dried product bears a resemblance to soil and is considered to be more marketable than dewatered biosolids.

The proposed initial installation of solar dryers will be a "pilot" installation consisting of two drying chambers. The goals of the "pilot" installation is to allow City staff to determine the efficacy of solar drying under local climatic conditions, as well as to allow time for the City to assess the market demand for a solar dried biosolids product. Research is currently underway to determine the marketability of the finished product and will ultimately influence the decision regarding the size and scope of a future expansion of the solar drying facilities at the Franklin WRF.

D. Combined Heat & Power System

CHP is the use of an engine to simultaneously generate electricity and heat. While traditional power generation utilizes less than 50 percent of the thermal energy in fossil fuels in converting that energy to electricity, CHP technology provides power plants the capability to capture much of this "waste heat," producing cycle efficiencies that can reach 80 percent.

Traditional power generation converts a fossil fuel's thermal energy into electrical energy through the combustion process, the inefficiencies of which result in large quantities of waste heat released to the surroundings. CHP technologies include a number of methods for recovering this energy through heat exchangers, resulting in a useable source of heat to be distributed to the site.

The feasibility of CHP for a facility is mainly dependent on its load profile, the site's electrical and thermal demands. Although electricity is inexpensively transmitted over long distances, thermal energy requires insulated piping, which is not only becomes cost prohibitive at great lengths, but also decreases in efficiency as heat is lost to the surroundings. When a facility's load profile fits a CHP application and the plant can reach 80 percent, however, producing instead of purchasing expensive electricity can provide a substantial savings and a large return on investment.

At the Franklin WRF, the load profile presents a clear match for the CHP. In the year 2018, the THP system demands 190 psig, saturated steam at a rate of 1,120 lb/hr. The hydrolyzed sludge is then digested, producing 81 ft^3/min (scfm) of biogas for use in the CHP to produce the electricity and steam to continue the cycle.

A CHP study examined the economic effects of the two thermal hydrolysis processes that were considered during this project, as well as two options for loading the engine: running the engine to produce the entire steam demand of the THP or to consume the biogas available from the digesters. Franklin has moved forward with Scenario 1 as briefly described below. More detail about this study can be found in the Preliminary Design Report attached as Appendix A

- Scenario 1: The CHP system is sized and loaded to produce the entire CAMBI steam demand.
- Scenario 2: The CHP system is sized and loaded to produce the entire Kruger steam demand.
- Scenario 3: The CHP system is sized and loaded to consume the digested biogas, producing steam for the CAMBI system.
- Scenario 4: The CHP system is sized and loaded to consume the digested biogas, producing steam for the Kruger system.

Scenarios 1 and 2 adjust the engine loading to meet the steam demand of the THP system, called "steam load following," while Scenarios 3 and 4 adjust the engine loading to consume 100 percent of the biogas produced in the digesters, called "biogas load following."

A full analysis of the THP and digestion processes from 2018 to 2040 can be found in the preliminary design report. There, it is clear that the digesters produce a fraction of the gas that is required to load the engine to produce the full THP steam load, about 65 percent of CAMBI and 45 percent of Kruger. As a result, Scenarios 1 and 2 require natural gas purchased from the local utility to be blended with the biogas to fuel the engine. Two firetube boilers, each rated at 50 percent of the THP maximum steam demand act as backup, allowing normal THP system operation during CHP maintenance or failure.

The approach of Scenarios 3 and 4, running the engine to consume the available biogas, requires only one engine. The firetube boilers, however, must supplement the CHP steam production during normal operation, and another unit is recommended to ensure plant capacity and reliability.

With two engines and two boilers, the capital costs of Scenarios 1 and 2 are nearly $1,000,000 more than Scenarios 3 and 4, which require three boilers but only one engine. However, the added capital costs of the increased engine capacity are counteracted by the electrical savings, and Scenarios 1 and 2 yield more than an additional million dollars over the life of this study.

Pre-selection of the THP vendor was conducted to further evaluate the products which resulted in the selection of the CAMBI system.

5. Public Awareness/ Exposure

The IWRP process focused on consensus building—specifically on reaching agreements between participating stakeholders regarding selection of options and a final alternative which would be the most broadly accepted and beneficial to the public. Consensus was achieved during the process through extensive transfer and sharing of knowledge, discussions amongst the stakeholders and eventual agreement on plan goals, rather than on the project preferences of individuals or their organizations. Historically, plans that are focused on consensus goals, such as the IWRP, are much more likely to receive broad support than plans formulated on individual preferences for specific projects.

The stakeholders group, which consisted of over 20 individuals, were selected to represent citizens of Franklin, the City's utility staff, other local and regional utilities, watershed organizations, technical advisors, and regulatory officials. The group were involved throughout the multi-year process and in the final selection of the alternative presented.

In all, there were over 30 public meetings related to the IWRP which included meetings with the Stakeholders, the Board of Mayor and Aldermen, and open public meetings specific to the IWRP. Many of these meetings included presentations directly related to the Biosolids Improvement Project. Public involvement and exposure is ongoing, including a public meeting that is yet to be scheduled pursuant to the requirements of TDEC's State Revolving Fund.

6. Summary

The final product from the proposed facilities will be a 40% solids Class A biosolids product up to a 75% solids Class A product for use with agricultural applications, soil amendments, etc. The City is in the process of evaluating various disposal options to develop a portfolio of alternatives as we move forward. It is anticipated that the City will retain a contractual relationship with a landfill should there be a necessity but anticipates that the majority of the solids produced will be beneficially reused.

The project uses various emerging technologies such as the THP and solar dryers that will improve the City of Franklin's biosolids management systems in significant ways including:

- Near elimination of landfilling biosolids, thereby reducing the risks of hauling WAS, fuel consumption, and staffing and equipment requirements,
- Beneficial reuse of Class A material,
- Beneficial reuse of FOG to increase the generation of biogas,
- The use of biogas through a CHP system to generate heat and power to help run the biosolids processes, and
- The use of solar energy to dry solids material versus thermal drying.

It is for these reasons that Franklin believes that the proposed project is an excellent candidate for the Clean Tennessee Energy Grant Program.

CDM Smith

CLIENT Franklin, TN
PROJECT WBF
DETAIL Clean Energy Grant Calc TOTAL

JOB NO. 14915-96594
DATE CHECKED 3/17/16
CHECKED BY PAP/LTW

ATTACHMENT 1 GSM
DATE 3/17/16
PAGE NO. 1 of 1

OVERALL FRANKLIN CHP EMISSIONS REDUCTION

GHG EMISSIONS (CO_2e tons/yr)	CHP SYSTEM	TOTAL DISPLACEMENT (ELECTRIC, THERMAL, FLARE)	CHP PERCENT REDUCTION
2018 (MAX THERMAL) 16,498 MMBTU	2,199	7,265	70% (MAX)
2018 (MIN THERMAL) 8,322 MMBTU	2,199	6,662	67% (MIN)
2040 (MAX THERMAL) 34,649 MMBTU	4,618	15,273	70% (MAX)
2040 (MIN THERMAL) 17,478 MMBTU	4,618	14,006	67% (MIN)

WATER MANAGEMENT DEPARTMENT

Mark S. Hilty
Director

ATTACHMENT 1

Dr. Ken Moore
Mayor

Eric S. Stuckey
City Administrator

HISTORIC
FRANKLIN
TENNESSEE

January 29, 2016

Tennessee Department of Environment and Conservation
The Office of Sustainable Practices – Clean Tennessee Energy Grant
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 2nd Floor
Nashville, Tennessee 37243

RE: Clean Tennessee Energy Grant Program Application
City of Franklin Biosolids Improvements Project

Dear Sir or Madam,

The City of Franklin is pleased to present the attached application to the Clean Tennessee Energy Grant Program. The City has been working over the past several years to develop a biosolids management program that focuses on sustainable practices that generate a finished product that will also be used in a beneficial reuse capacity.

The project scope is fairly complex with an estimated construction value of over $50M. The attached pre-proposal narrative attempts to capture the key elements of the program. We are currently nearing the completion of final design. I have attached the preliminary design report (Appendix A) and the most recent opinion of probable costs (Appendix B) which I hope will provide valuable information as you consider our application. I would like to note that the current construction value is not identical to the OPPC due to some modifications not related to the application since the OPPC was developed.

Thank you very much for the opportunity to submit our application. I will be happy to provide additional information as you see fit and am excited about the opportunity to work with you on this project.

Sincerely,

Mark S. Hilty
Water Management Director
City of Franklin

RECEIVED

JAN 29 2016

ENVIRONMENT AND CONSERVATION
COMMISSIONER'S OFFICE

Appendix A: Preliminary Design Report

ATTACHMENT 1

REPORT

Franklin WRF Modifications & Expansion

Addendum to Preliminary Design Report – Preliminary Design of Solids Treatment Facilities

City of Franklin, Tennessee

June 2014

CDM Smith

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Abbreviations

ACH	Air changes per hour
ADF	Average daily flow
ADMM	Average day in the maximum month
AHJ	Authority having jurisdiction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
ARI	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning
ATAD	Autothermal thermophilic aerobic digestion
BFP	Belt filter press
BMP	Best management practice
BTU	British thermal unit
CCTV	Closed-circuit television
CFM, cfm, SCFM	Cubic feet per minute, standard cubic feet per minute
CFR	Code of Federal Regulations
CHP	Combined heat and power
CIP	Clean in place or cast-in-place
CMU	concrete masonry unit
CY	Cubic yard
DAF	Dissolved air flotation
DEM	Digital elevation model
DT	Dry ton
DWPC	TDEC's Division of Water Pollution Control
DWV	Drainage, waste and vent
ENRCCI	*Engineering News-Record* Construction Cost Index
EPA, USEPA	United States Environmental Protection Agency
FM	Factory Mutual
FOG	Fats, oils and greases
GC	General Contractor or General Conditions
GPM, gpm	Gallons per minute
H_2S	Hydrogen sulfide
HMI	Human-machine interface
HP, hp	Horsepower
HRSG	Heat recovery steam generator
HVAC	Heating, ventilation and air conditioning
I/O	Inputs/outputs
IBC	International Building Code

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ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronic Engineers
ISA	Instrument Society of America
IWRP	Integrated Water Resources Plan
kW, kWh	Kilowatt, kilowatt hour
LTSA	Long-term service agreement
MAD	Mesophilic anaerobic digestion
MBH	Thousand BTU per hour
MBR	Membrane bioreactor
MBTU	Thousand British thermal units
MCC	Motor control center
MD	Maximum day
MG	Million gallons
MGD, mgd	Million gallons per day
MMBTU	Million British thermal units
MOPO	Maintenance of plant operations
MW	Megawatt
NaOCl	Sodium hypochlorite
NaOH	Sodium hydroxide (caustic soda)
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and maintenance
OPCC	Opinion of probable construction cost
ORP	Oxidation-reduction potential
OSHA	Occupational Safety and Health Administration
P&ID	Process and instrumentation diagram
PDR	Preliminary Design Report
PFD	Process flow diagram
PLC	Programmable logic controller
PS	Primary sludge or pump station
psi, PSI	Pounds per square inch
RDT	Rotary drum thickener
RO	Reverse osmosis
SCADA	Supervisory control and data acquisition
SMACNA	Sheet Metal and Air Conditioning Contractors National Association

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SRT	Solids retention time
SSR	Smith Seckman Reid
TDEC	Tennessee Department of Environment & Conservation
THP	Thermal hydrolysis pretreatment
TM	Technical Memorandum
TS, TSS	Total solids, total suspended solids
UL	Underwriters Laboratories
VFD	Variable frequency drive
VS, VSD, VSR	Volatile solids, volatile solids destruction/reduction
WAS	Waste activated sludge
WRF	Water reclamation facility
WT	Wet ton
WWTF, WWTP	Wastewater treatment facility/plant

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Section 1
Introduction

1.1 Background

CDM Smith has been tasked by the City of Franklin (the City) to provide design services for the expansion of the Franklin Wastewater Reclamation Facility (WRF). The project includes an expansion of the facility's existing solids treatment facilities.

The previous Phase II Integrated Water Resources Plan (IWRP) project, also performed by CDM Smith, included an assessment of the Franklin WRF's existing solids handling facilities; a review of historical operating data and operation and maintenance (O&M) costs; an overview of solids treatment requirements based on projected future wastewater flows to the facility; an assessment of capital, O&M and net present costs for four potential solids process trains; and finally, a concept-level analysis of the selected option, which consisted of rotary drum thickening (RDT) followed by mesophilic anaerobic digestion (MAD), screw press dewatering, and solar drying. The City preferred anaerobic digestion because it could achieve Class B treatment, reduce the quantity of biosolids, and potentially produce energy (methane from digester biogas) in support of the City's sustainability goals. Furthermore, solar drying offers relatively low O&M costs and a product that can be beneficially reused in agriculture as well as by the public. The September 2012 Biosolids Conceptual Design Report, included as an appendix to the final IWRP report, recommended further study of the conceptual design and costs prior to final acceptance by the City and detailed design by CDM Smith.

Next, CDM Smith and the City explored the varying levels of solids treatment that would provide the City with flexibility in its reuse and disposal options. After developing four solids process train alternatives for the City's consideration, CDM Smith performed a preliminary engineering analysis of each alternative. The June 2013 Biosolids Management Preliminary Engineering Technical Memorandum (TM) presented information on these four alternatives and facilitated the City's selection and approval of a solids process train in January 2014.

The goals of this Preliminary Design Report (PDR) are to present the preliminary design criteria for the approved improvements to the Franklin WRF's solids treatment facilities, and to serve as the basis for final design.

This PDR is submitted as an addendum to CDM Smith's January 2013 Preliminary Design Report for Franklin Wastewater Reclamation Facility Expansion Project, hereinafter referred to as the January 2013 PDR.

1.2 Scope of Work

The scope of CDM Smith's work is described in Section 1.2 of the January 2013 PDR. Biosolids-related amendments to the scope of work include the following.

- Task 307C – Expansion of the Biosolids Management Evaluation Work
- Task 307E – Site Survey & Geotechnical Investigation of Expanded Biosolids Area

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- Task 406 – Expansion of the Biosolids Management System Design Scope
- Task 409 – Assistance with Competitive Pre-Selection of Certain Biosolids Equipment

1.3 Report Organization

This report is organized into the following sections. Many of the design concepts, regulatory requirements, and building codes previously presented in the January 2013 PDR apply to the solids treatment improvements described herein.

- Section 1 - Introduction
- Section 2 – Existing Solids Treatment Facilities
- Section 3 – New Solids Treatment Facilities Design Criteria
- Section 4 – Proposed Solids Treatment Facilities
- Section 5 – Civil/Site Work
- Section 6 - Architectural
- Section 7 – Structural
- Section 8 – Heating, Ventilation & Air Conditioning
- Section 9 – Plumbing
- Section 10 – Electrical Power Distribution
- Section 11 – Instrumentation & Control
- Section 12 – Permit Requirements & Maintenance of Plant Operations
- Section 13 – Opinion of Probable Construction Cost

Appendices accompanying this report include TMs that detail analyses that have been performed throughout the biosolids preliminary design phase. They are organized as follows.

- Appendix A –Evaluation of CHP Strategies
- Appendix B –Evaluation of Sludge Screening
- Appendix C –Rationale for Scope of Biosolids Equipment Pre-Selection

1.4 Reference Reports & Documents

The following references were used in the preparation of this report.

- CDM Smith's Preliminary Design Report for Franklin Wastewater Reclamation Facility Expansion Project, January 2013 (hereinafter referred to as the January 2013 PDR)
- CDM Smith's Biosolids Management Preliminary Engineering TM, June 2013

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- CDM Smith's Biosolids Conceptual Design Report, September 2012
- CDM Smith's Biosolids TM No. 1 – Evaluation of Existing Equipment & Sludge Production Forecast, dated April 14, 2011.
- Record Drawings and other drawings for the following expansions and modifications:
    - Wastewater Treatment Plant Biosolids Treatment Facilities, dated February 22, 1995
    - Wastewater Treatment Plant Additions and Modifications, dated March 1997
    - WWTP Renovation to 12 MGD, Contract 3 – Long Term Improvements, dated December 2004
    - WWTP Renovation to 12 MGD, Contract 2 – Near Term Improvements, dated April 2001
    - Sewerage System Additions, dated 1973
- Franklin WWTP O&M Manual & Standard Operating Procedures

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Section 2
Existing Solids Treatment Facilities

This section describes the existing solids treatment facilities at the Franklin WRF.

Because the new solids treatment process is a near-total replacement of these facilities, CDM Smith and the City expect that most of the existing equipment and structures will be demolished as part of the Modifications and Expansion Project. Buildings that can serve other purposes, such as storage or workshop space, will be retained.

2.1 Solids Facilities History

First constructed in the 1970s, the Franklin WRF's original solids treatment facilities included a rectangular aerobic digester tank that accepted sludge from two circular clarifiers. The digested sludge flowed to sludge drying beds at the southwest end of the plant prior to ultimate disposal.

In the 1990s, the City implemented a Class A biosolids stabilization process called autothermal thermophilic aerobic digestion (ATAD). Because the ATAD process, as implemented, was extremely odorous, this method of stabilization was soon abandoned. Other solids handling facilities added during this project included one dissolved air flotation (DAF) thickener and sludge storage and pumping facilities. Subsequent solids treatment improvements in the late 1990s and early 2000s removed much of the ATAD equipment and piping; increased WAS pumping capacity; added a second DAF thickener; added an odor control system; and added belt filter presses (BFPs) and supporting equipment for dewatering of the thickened sludge.

2.2 Equipment and Process Summary

Solids generated at the Franklin WRF are continuously thickened, stored during off times of dewatering operation, and dewatered approximately 12 hours per day, 5 days per week. The dewatered sludge is transported approximately 108 miles (one way) to a private landfill in Camden, Tennessee, for disposal. The City uses three City-owned trucks and employs three full-time drivers in its disposal operations.

Figure 2.2-1
WAS Pumps for Clarifiers 9 & 10

During CDM Smith's condition assessment, included in the April 2011 Biosolids Technical Memorandum No. 1, the overall solids treatment system received a poor rating. Nearly all of the solids handling equipment requires a high level of maintenance and is near – or past – the end of its service life.

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2.2.1 WAS Pumping

The waste activated sludge (WAS) pumps send sludge from the secondary clarifiers to the DAF system for thickening. There are two WAS pumping stations associated with the secondary clarifiers; the first station receives flow from Clarifiers 5 through 8, and the second station receives flow from Clarifiers 9 and 10. Each WAS pump is dedicated to a single clarifier and is a horizontal self-priming centrifugal pump.

Figure 2.2-2
DAF Thickener

2.2.2 Thickening

The components associated with the DAF thickening system include two DAF tanks, scum skimmers, and sludge rakes driven by two ¾-hp flotator drives, two 30-hp recycle pumps, two 10-hp thickened sludge pumps, and two 15-hp air compressors. As WAS is pumped from the secondary clarifiers and enters the DAF tanks, the lighter solids float, and heavier solids sink. Solids are removed from the tank and pumped to the thickened sludge tank, sludge storage tanks, or the BFP feed tank. Typically, these tanks are used during the week as temporary storage, as the BFPs are continuously operating. On the weekends, however, solids are stored in these tanks until Monday, when the BFPs begin operation and these tanks are incrementally emptied and bled back into the solids stream in preparation for the next weekend.

Operators report that the DAF thickening system is now the most maintenance-intensive solids treatment equipment at the plant.

2.2.3 Dewatering

The dewatering system consists of two Ashbrook Simon-Hartley Klampress extended-gravity, eight-roller BFPs, two BFP feed pumps, BFP feed tanks, sludge storage tanks, a polymer injection system, and a belt conveyor. The DAF-thickened feed sludge is pumped to holding tanks before being conditioned with a polymer solution. The conditioned sludge is then pumped to the BFPs by two progressive-cavity BFP feed pumps. The top section of the BFP is a gravity drainage section, where sludge is raked into ridges and furrows to enhance drainage. The two belts come together and roll through eight progressively smaller rollers, where excess water is squeezed out. These units were installed in 1996 and were reconditioned in 2011.

Figure 2.2-3
Belt Filter Press

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During the 2011 condition assessment, discussions with WRF staff revealed that there was an unequal distribution of sludge between the two BFPs due to inadequate splitting of the sludge in the piping. It was also observed that, in some places, sludge sticks to the belt. Sludge sticking to the belt is an indication of uneven mixing or overdosing of polymer. There is also limited additional storage space to store thickened sludge in an emergency or if pressing operations are stopped.

The sludge currently fed to the BFPs also contains grit and has been found to wear on the rubber helical lobe impellers of the feed pumps. On these pumps, the rotors and stators wear at a quicker pace than expected.

2.2.4 Supporting Facilities

Adjacent to the Dewatering Building is a chemical scrubber odor control system that is dedicated to the solids treatment facilities. This system, installed in the early 2000s, includes sodium hypochlorite and sodium hydroxide (caustic soda) storage and feed systems. The system treats odorous air drawn from the BFP room in the Dewatering Building, as well as from the truck loading bay, where trucks receive the dewatered sludge from the BFPs. A make-up air system provides fresh air to the BFP room.

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Section 3

New Solids Treatment Facilities Design Criteria

This section presents the design criteria for the Franklin WRF's new solids treatment facilities.

3.1 Historical & Projected Flows

An analysis of historical wastewater flows was presented in Section 2 of the January 2013 PDR.

Wastewater flow projections were developed by Smith Seckman Reid, Inc. (SSR), in 2011 and used as the basis for the IWRP and the January 2013 PDR; SSR has since updated the overall projections based on its 2013 updates to flow projections for selected drainage basins. The original and updated flow projections, transmitted by SSR to the City and CDM Smith, are listed in **Table 3.1-1.**

Table 3.1-1 Original & Updated Wastewater Flow Projections

Year	Original Projection (mgd)	Updated Projection (mgd)
2015	11.8	12.5
2020	14.3	16.1
2025	16.7	19.7
2030	19.1	23.3
2035	21.6	27.0
2040	24.0	30.6

Source: SSR
Flows listed are average daily flows (ADF).

As shown in **Figures 3.1-1 and 3.1-2,** these projections represent an increase in the anticipated flow to the facility throughout the planning period ending in 2040. Whereas the biosolids facilities presented in the September 2012 Biosolids Conceptual Design Report and the Biosolids Management Preliminary Engineering TM had been based on a 2040 design flow of 24 mgd, the updated projections now suggest the need for an ultimate solids treatment capacity based on a design flow of 30.6 mgd.

Although the location of the City's future treatment capacity expansion has not yet been determined, the City still intends to consolidate solids treatment at the Franklin WRF. At a March 26, 2014, meeting, the City and CDM Smith agreed that, regardless of whether the City expands the Franklin WRF or constructs a new treatment plant elsewhere, the Franklin WRF solids facilities will be designed to handle solids generated by an average daily wastewater flow of 20 mgd in Phase I (design year 2023) and an ultimate flow of 32 mgd ADF in Phase III (design year 2040).

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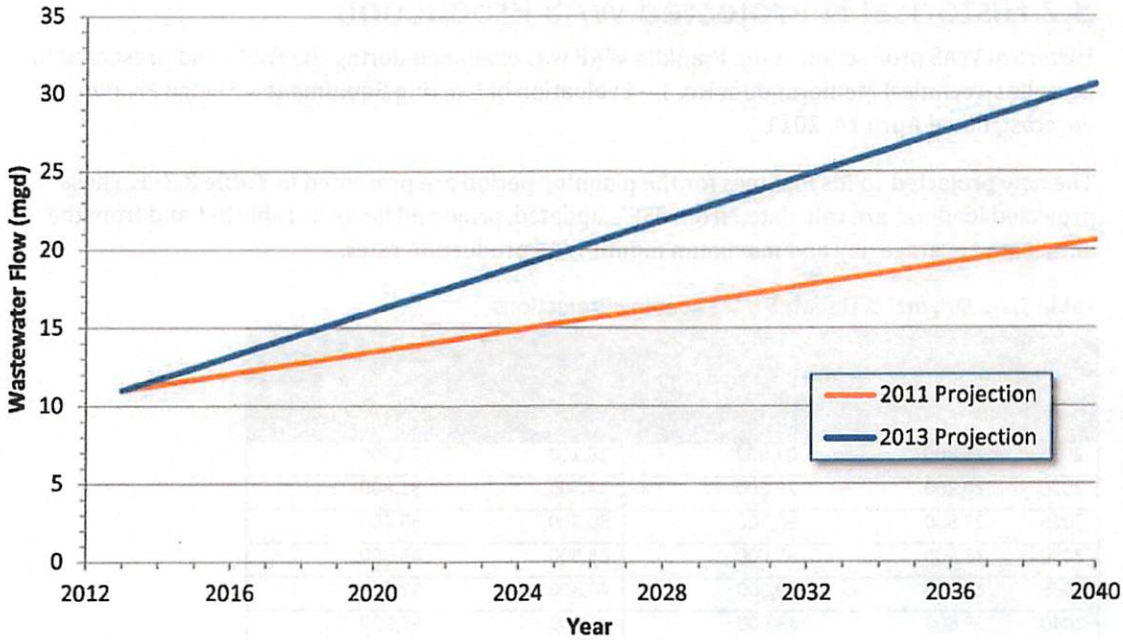

Figure 3.1-1
2011 & 2013 Wastewater Flow Projections

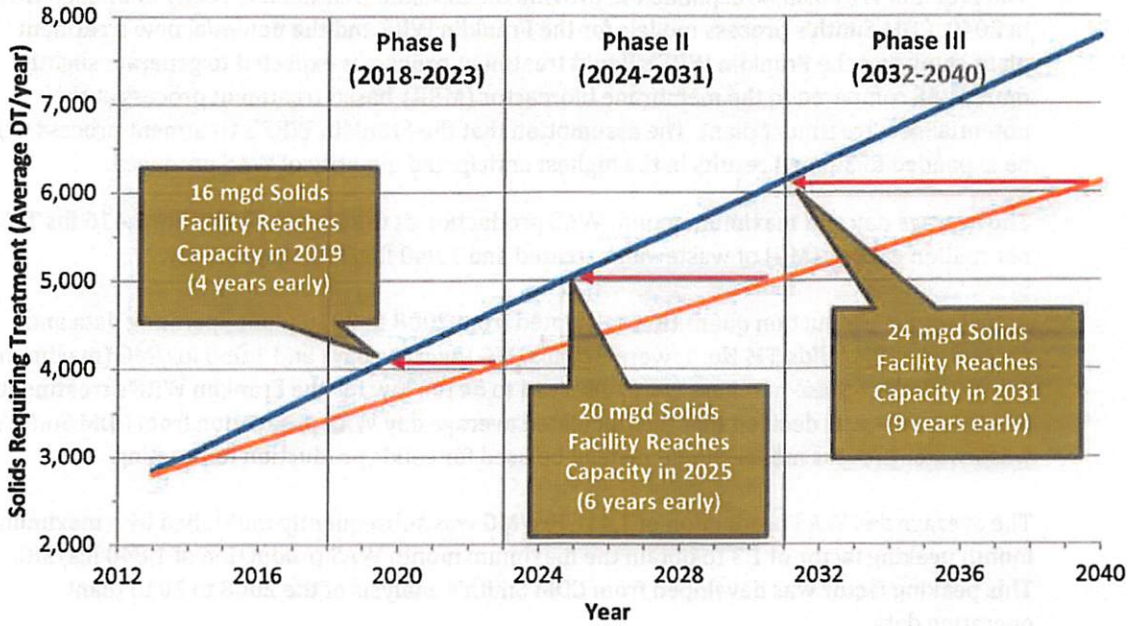

Figure 3.1-2
Original & Updated Projected Loads to Solids Treatment Process

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3.2 Historical & Projected WAS Production

Historical WAS production at the Franklin WRF was examined during the IWRP and presented in Biosolids Technical Memorandum No. 1 – Evaluation of Existing Equipment & Sludge Production Forecast, dated April 14, 2011.

The new projected solids loadings for the planning period are presented in **Table 3.2-1.** These projected loadings are calculated from SSR's updated, projected flows in Table 3-1 and from the anticipated average day and maximum month WAS production rates.

Table 3.2-1 Original & Updated WAS Loading Projections

	Original Projection		Updated Projection	
Year	Average Day Solids Production (lbs/day)	Maximum Month Solids Production (lbs/day)	Average Day Solids Production (lbs/day)	Maximum Month Solids Production (lbs/day)
2015	16,800	21,800	18,100	23,600
2020	20,200	26,300	24,500	31,800
2025	23,600	30,700	30,300	39,400
2030	26,900	35,000	35,300	45,900
2035	30,200	39,300	40,300	52,400
2040	33,600	43,600	45,300	58,900

In order to arrive at a conservative estimate of WAS production, CDM Smith made the following assumptions.

- The Franklin WRF will be expanded to provide the ultimate treatment capacity of 32 mgd ADF in 2040. CDM Smith's process models for the Franklin WRF and the potential new treatment plant show that the Franklin WRF's liquid treatment process is expected to generate slightly more WAS compared to the membrane bioreactor (MBR)-based treatment process at the potential new treatment plant. The assumption that the Franklin WRF's treatment process will be expanded to 32 mgd results in the highest anticipated quantity of WAS produced.

- The average day and maximum month WAS production at the Franklin WRF are 1,416 lbs TSS per million gallons (MG) of wastewater treated and 1,840 lbs/MG, respectively.

  Actual sludge production quantities, calculated from 2008 to 2010 plant operating data and presented in Biosolids TM No. 1, were 820 lbs/MG (average day) and 1,056 lbs/MG (maximum month). Both of these numbers were observed to be too low for the Franklin WRF's treatment process, and it was decided that the calculated average day WAS production from CDM Smith's wastewater process model should instead be used for solids production forecasting.

  The average day WAS production of 1,416 lbs/MG was subsequently multiplied by a maximum month peaking factor of 1.3 to obtain the maximum month WAS production of 1,840 lbs/MG. This peaking factor was developed from CDM Smith's analysis of the 2008 to 2010 plant operating data.

The sizing of the solids treatment equipment in this PDR is based upon these design parameters. Should the City choose to construct a new treatment plant instead of expanding the Franklin WRF, slightly lower WAS production is expected from the new treatment process.

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3.3 Historical & Projected FOG Addition to Digesters

According to City records, between 20,000 and 78,000 gallons of fats, oil, and grease (FOG) are pumped out of grease traps at Franklin's restaurants and food service establishments each month. This FOG is hauled to a privately-owned processing facility near Nashville for disposal. With the proposed addition of MAD at the Franklin WRF, the readily-biodegradable FOG represents an opportunity to enhance biogas production in the anaerobic digesters and increase production of useful heat and power at the new combined heat and power (CHP) facility included in this project.

In order to estimate the quantity of FOG that could be added to the anaerobic digesters, CDM Smith obtained monthly records from the City for 2010 to 2012. These records consisted of the daily quantities of grease pumped by permitted haulers from grease traps at the City's restaurants and other food service establishments. The results of this analysis are presented in **Table 3.3-1.**

Table 3.3-1 Quantities of FOG Pumped, 2010 to 2012

Year	Total FOG Pumped (gal)	Avg FOG Pumped in Max Month (gal/calendar day)	Avg Daily FOG Pumped (gal/calendar day)	Max Month Peaking Factor	Estimated Population[1]	Avg FOG Production (gal/ calendar day/ capita)
2010	439,000	1,900	1,200	1.55	62,700	0.019
2011	611,000	2,400	1,700	1.40	66,000	0.025
2012	641,000	2,600	1,800	1.48	69,000	0.025
Averages	**n/a**	**n/a**	**n/a**	**1.5**	**n/a**	**0.023**

[1] High population projection from IWRP.

Based on the design parameters obtained above, the average day and maximum month FOG production were estimated. **Table 3.3-2** presents these estimates.

The FOG production in Table 3.3-2 is expressed not only in terms of per calendar day, but also in terms of the number of days of the week on which the permitted hauling companies are actively pumping out grease traps around the City. On average, the haulers pumped out grease traps three to four days per week. The projected FOG production per operating day is based on an operating schedule of four days per week.

Table 3.3-2 FOG Production Projections

Year	Projected Population	Avg Daily FOG Production (gal/calendar day)	Avg Day FOG Production in Max Month (gal/calendar day)	Avg Daily FOG Production (gal/operating day)[1]	Avg Day FOG Production in Max Month (gal/operating day)[1]
2015	79,000	1,800	2,700	3,200	4,700
2020	91,000	2,100	3,200	3,700	5,600
2025	104,000	2,400	3,600	4,200	6,300
2030	119,000	2,700	4,100	4,700	7,200
2035	135,000	3,100	4,700	5,400	8,200
2040	154,000	3,500	5,300	6,100	9,300

[1] Based on operating schedule of four days per week.

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Table 3.3-3 presents the maximum day peaking factors for 2010 through 2012. This calculation was based on the same number of operating days used to calculate the projected FOG production in Table 3.3.-2. These results indicate that the maximum daily quantity of FOG the Franklin WRF's FOG receiving station could be expected to handle in a given day is more than five times the average daily quantity received. CDM Smith's experience with FOG receiving in other parts of the United States confirms that FOG deliveries can be highly variable in terms of volume.

Table 3.3-3 Maximum Daily FOG Pumping, 2010 to 2012

Year	Maximum Daily Total FOG Pumped (gal/operating day)	Average Daily Total FOG Pumped (gal/operating day)	Max Pumping Day Peaking Factor
2010	11,000	2,500	4.36
2011	14,000	2,900	4.68
2012	19,000	3,000	6.32
Averages	**n/a**	**2,800**	**5.1**

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Section 4
Proposed Solids Treatment Facilities

4.1 Overview

This section describes the proposed solids treatment facilities, which represent a complete replacement of the Franklin WRF's solids treatment processes.

Figure 4.1-1 presents a process flow diagram of the proposed process train. **Figures 4.1-2 and 4.1-3** present the layout of the Solids Processing Building, which houses the sludge screening, pre-dewatering, and post-dewatering processes. The preliminary solids treatment facilities site plan can be found in **Section 5.**

4.2 WAS Pumping, Screening & Storage

4.2.1 Existing Conditions

As described in Section 2, the Franklin WRF currently has two WAS pumping stations; one receives flows from Clarifiers 5, 6, 7 and 8, and the other receives flows from Clarifiers 9 and 10. The WAS pumps are horizontal, self-priming centrifugal T-Series pumps manufactured by Gorman Rupp. Each pump is dedicated to a single clarifier.

4.2.2 Design Criteria

Table 4.2-1 lists the design criteria for WAS pumping, screening, and storage.

Table 4.2-1 Design Criteria – WAS Pumping & Storage

Parameter	Value
WAS Pumping Upgrades	
Location(s)	TBD
Number of WAS Pumps	TBD
Pump Type	Horizontal split-case centrifugal
Pump Capacity (each)	TBD
Pump TDH	TBD
Pump Motor Horsepower	25 max.
Pumped Fluid	Raw WAS (0.84% to 1% solids)
Diameter of WAS Force Main	TBD
Manufacturers	Gorman Rupp or equal
WAS Screening	
Location	Solids Processing Building Second Floor
Number of Sludge Screens	Phase I: Two (one duty, one standby) Ultimate: Three (two duty, one standby)
Screen Type	Enclosed, pressurized flow-through type
Screen Size	5mm
Screen Capacity (each)	440 gpm at 1% solids
Screen Pressure Drop (each)	10 psi average, 17 psi maximum

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Parameter	Value
Number of Screenings Bins	Phase I: Two; Ultimate: Three
Screenings Bin Size (each)	6' x 6' x 6' (8 cubic yards)
Sludge Screen Manufacturers	Huber Technology, Hydro International or equal
WAS Storage & Mixing	
Location	West of Solids Processing Building
Number of Storage Tanks	One
Tank Capacity	280,000 gallons
Tank Type	Prestressed, wire-wrapped concrete or glass-lined steel
Tank Dimensions	45' diameter x 24' sidewater depth
Tank Suppliers	Prestressed concrete: CROM Corporation, Precon, DN Tanks or equal Steel: Tank Connection, Aquastore or equal
Type of Mixing System	Pumped recirculation with ductile iron in-tank mixing manifold
Number of Mixing Pumps	Two (one duty, one standby)
Mixing Pump Type	End suction centrifugal
Mixing Pump Capacity (each)	6,600 gpm
Mixing Pump TDH	18 feet
Mixing Pump Motor Horsepower (each)	40 HP, constant speed
Pumped Fluid	Screened WAS (0.84% to 1% solids)
Mixing System Manufacturers	Evoqua (JetMix), Vaughan (Rotamix) or equal

4.2.3 Proposed Improvements

Sludge screens are recommended in order to reduce wear on downstream pumps and THP system components; reduce the frequency of digester maintenance; and enhance the marketability of the Class A biosolids product. A discussion of sludge screening can be found in **Appendix B.**

CDM Smith has performed hydraulic modeling of the existing WAS pumps and concluded that they lack sufficient head to overcome the pressure drop introduced by the sludge screens. As a result, upgrades to the WAS pumps are needed. The scope of the WAS pumping upgrades will be completed and described in this section prior to the final PDR submittal to the City.

The upgraded WAS pumps will deliver raw WAS to the sludge screens, which will be located on the second floor of the Solids Processing Building. The screened sludge will be discharged to the WAS storage tank, located adjacent to the sludge screening room on the east side of the building. Screened solids will fall from the screens' discharge chutes into bins located on the first floor. The bins will be manually emptied by City truck drivers, who will access the bins via a dedicated roll-up door in front of each bin. To move screening equipment and parts in and out of the Solids Processing Building, plant staff will use dollies or portable cranes to roll the equipment into the adjacent pre-dewatering room, then use the traveling bridge crane in that room to transfer materials to the truck bay below.

The WAS storage tank, which will receive screened WAS, is sized to provide eight hours of storage at maximum month conditions in 2040. The tank will be a prestressed, wire-wrapped concrete tank with integral fixed roof and will include a mixing system. The mixing system will consist of two mixing

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pumps (one duty and one standby), with a ductile iron pipe mixing manifold inside the tank. The mixing pumps will be located outside the tank at grade level. Odor control will be provided for the WAS storage tank, as well as for the screenings bin room.

4.2.4 Preliminary Control Descriptions

The upgraded WAS pumps' controls and operating sequence will be described in this section prior to the final PDR submittal to the City.

Manual valves on the feed piping to the sludge screens will allow operators to select the duty screen(s) and place a screen out of service for maintenance or repair. Each sludge screen will be equipped with pressure transmitters on the sludge inlet and discharge, as well as a moisture sensor for the screened solids. An air pressure regulator regulates the pneumatic cone that dewaters the screened solids. In automatic mode, the screens will run continuously as long as the pressure differential between the sludge inlet and discharge is at a preset point. Motor overload, motor over-torque, high pressure at the sludge inlet, low air pressure, and detection of moisture in the screenings discharge will shut off the screen and trigger an alarm in the plant control system.

High level in the WAS storage tank will trigger an alarm in the plant control system, shut down the WAS pumps, and shut down the sludge screens.

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Insert Figure 4.1-1

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4.3 Pre-THP Dewatering (Pre-Dewatering)

Pre-THP dewatering (hereinafter referred to as pre-dewatering) is the first of two dewatering steps in the solids treatment train. This dewatering step reduces the water content of the screened WAS to a level that makes the sludge suitable for thermal hydrolysis.

Each of the two potential THP system suppliers requires a different dewatered cake dryness. For now, this section presents the design criteria for both suppliers. It will be refined after the THP supplier is selected.

4.3.1 Design Criteria

Table 4.3-1 presents the design criteria for the pre-dewatering system.

Table 4.3-1 Design Criteria – Pre-Dewatering System

Parameter	Value
Pre-Dewatering Centrifuge Feed Pumps	
Location	Solids Processing Building First Floor
Pump Type	Progressing cavity
Number of Pumps	Phase I: Three (two duty, one standby) Ultimate: Four (three duty, one standby)
Pump Capacity (each)	20 to 200 gpm
Pump TDH (approx.)	40 feet
Pump Motor Horsepower (each) (approx.)	25 HP
Pumped Fluid	Screened WAS (0.84% to 1% solids)
Manufacturers	Moyno, Netzsch, Seepex or equal
Pre-Dewatering Centrifuges	
Location	Solids Processing Building Second Floor
Dewatering Technology	Horizontal, solid-bowl centrifuge
Number of Centrifuges	Phase I: Three (two duty, one standby) Ultimate: Four (three duty, one standby)
Solids Capacity (each)	900 lbs dry solids/hour
Hydraulic Capacity (each)	200 gpm
Cake Solids	16% to 22%
Polymer Consumption	16% cake solids: 12 to 20 lbs active/DT 22% cake solids: 20 to 30 lbs active/DT
Minimum Solids Capture	95%
Motor Horsepower	Main Drive: 125 HP (max.) Backdrive: 40 HP (max.)
Manufacturers	Westfalia Separator, Andritz, Flottweg or equal
Pre-Dewatered Cake Conveyance	
Dewatered Solids Conveyance	Enclosed, shaftless screw conveyor
Number of Conveyors	Two (one per pair of centrifuges)
Materials of Construction	Stainless steel
Manufacturers	Spirac or equal

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4.3.2 Proposed Improvements

The pre-dewatering feed pumps will be located on the first floor of the Solids Processing Building. They will draw screened WAS from the WAS storage tank, accept inline injection of a polymer solution to aid in flocculation, and deliver the sludge/polymer mixture to the pre-dewatering centrifuges on the second floor. The pre-dewatering polymer system is discussed in **Section 4.11.**

The dewatered cake that drops out of the centrifuges' solids discharge chutes will be transferred via enclosed screw conveyor into the pre-dewatered cake storage bin on the first floor. The discharge chutes of the screw conveyors will drop through the second floor and directly into the bin. This bin is a part of the selected THP supplier's scope of supply, and it will be further detailed after pre-selection is completed.

The dewatered cake bin and the centrifuges' liquid discharge chutes will be odor controlled.

A traveling bridge crane will be provided for ease of centrifuge maintenance. The pre-dewatering room will be open to the Solids Processing Building truck bay so that equipment can be transferred to and from service trucks parked in the truck bay. The bridge crane will also be used to lift equipment brought over from the adjacent sludge screen room.

4.3.3 Preliminary Control Descriptions

The plant control system will enable the operator to select the duty and standby centrifuges and their respective WAS feed pumps. When started, the centrifuges will typically engage in an automated start-up procedure that typically consists of a timed clean-in-place (CIP) sequence using wash water and a gradual increase in bowl and scroll speed. After this startup sequence has been completed, the control system will start the WAS feed pumps, the polymer feed pumps, and the dewatered cake conveyors. The WAS feed pumps' speed will be adjusted to suit the centrifuge speed. The polymer feed pumps' speed will be flow paced to the WAS feed rate to deliver a consistent dose of polymer. The wet sludge that discharges from the centrifuge during start-up will be diverted to the plant drain through the use of a motorized knife gate on the solids discharge chute.

Low level in the WAS storage tank will trigger an alarm in the plant control system, which will subsequently shut down the active feed pumps and polymer feed pumps. The plant control system will also command the active centrifuges to begin their shutdown and CIP sequence.

Zero speed detection, motor overload, or motor over-torque at the dewatered cake conveyors will trigger an alarm in the plant control system and shut down the affected centrifuges and their WAS feed and polymer feed pumps. The conveyor covers will also be equipped with limit switches to shut them down if a cover is opened.

4.4 FOG Receiving & Treatment

4.4.1 Design Criteria

Table 4.4-1 presents the general design criteria for the FOG receiving station, including characteristics and quantities of the FOG.

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Table 4.4-1 General Design Criteria – FOG Receiving & Treatment

Parameter	Value
Peaking Factors	Max. Month: 1.5 Max. Day: 5.1
Receiving Station Days of Operation	4 to 5 days/week
Anticipated Quantity Received (2018)[1]	Average Day: 3,500 gal/day Max. Month: 5,200 gal/day Max. Day: 17,700 gal/day
Anticipated Quantity Received (2040)[1]	Average Day: 6,200 gal/day Max. Month: 9,300 gal/day Max. Day: 31,700 gal/day
Solids Content (assumed)	Total Solids: 4 to 10 percent Volatile Solids: 85 percent of total solids
Volatile Solids Destruction in Digester	75 percent
Digester Gas Yield of FOG	1.8 times typical WWTP sludge gas yield

[1] Per operating day at four operating days per week.

Table 4.4-2 describes the design criteria for the FOG receiving station.

Table 4.4-2 Design Criteria – FOG Receiving & Treatment

Parameter	Value
Location	Adjacent to Digester Building
Number of Tanker Unloading Stations	Two
FOG Storage & Mixing	
Number of Storage Tanks	Phase I: One Ultimate: Two
Storage Tank Type	Glass-lined, bolted steel with mixing system & hot water circulation
Storage Tank Capacity (each)	20,000 gallons
System Temperature	110°F
Type of Mixing System	Pumped mixing system with ductile iron pipe mixing manifold
Number of Mixing Pumps	Phase I: Two (one duty, one standby) Ultimate: Three (two duty, one standby)
Mixing Pump Type	Centrifugal chopper
Mixing Pump Capacity (each)	TBD
Mixing Pump TDH	TBD
Mixing Pump Motor Horsepower (each)	TBD
Pumped Fluid	FOG (4% to 10% solids)
Tank Manufacturers	Aquastore or equal
Mixing System Manufacturers	Evoqua (JetMix), Vaughan (Rotamix) or equal
FOG Pumping	
FOG Feed Point	TBD (dependent on THP system selection)
Pump Type	Progressing cavity
Number of Pumps	Two (one duty, one standby)
Pump Capacity (each)	2 to 25 gpm
Pump Motor HP	TBD (dependent on feed point)
Pump TDH	TBD (dependent on feed point)

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Parameter	Value
Accessories	Heat tracing & insulation (maintain temperature of 110°F)
Manufacturers	Seepex, Moyno, Netzsch or equal

4.4.2 Proposed Improvements

The FOG receiving station will be located in an area that can be separated from the rest of the Franklin WRF through the use of fencing and gates. For ease of entry and exit, the receiving station will be a drive-through facility. The receiving station will operate four to five days per week to coincide with the weekday schedules of the permitted haulers. Two unloading stations will be provided.

Drivers will connect their tankers to a 4- or 6-inch quick-connect coupling that leads to a cleanable polymer concrete "rock box" that captures large debris such as silverware and plastic wrappers. The FOG will overflow the rock box and flow by gravity to the storage tanks, which will employ a hot water circulation system to maintain a temperature of 110°F. To keep the FOG suspended, a pumped mixing system consisting of external chopper pumps and an in-tank nozzle system will be provided.

In addition to being heated, the FOG tanks will be odor controlled. Manway access will be provided for ease of cleaning the tanks and rock boxes. Hot water connections will be provided for flushing of FOG piping.

The use of a magnetic flow meter for FOG flow measurement has been problematic in other installations. CDM Smith recommends alternative methods of recording and billing for FOG deliveries, such as charging haulers a flat fee per load or using a weigh scale to measure trucks' weights before and after delivering their loads. If a weigh scale is installed, it could also be used to measure the quantities of dried or dewatered biosolids that are hauled away.

Closed-circuit television (CCTV) cameras and an intercom system will allow plant operators to monitor the activities at the station and communicate with drivers. To deter illicit dumping of materials harmful to the treatment process, other security measures such as automated cameras to photograph tankers and their drivers, or a receiving station access gate requiring key card or key code authentication, may also be included as design progresses. Regular sampling and analysis of the received FOG is also highly recommended.

4.4.3 Preliminary Control Descriptions

Failure of the FOG storage tank mixing pumps or the hot water circulation equipment will trigger an alarm in the plant control system. High level in the FOG storage tank will also trigger alarms both at the unloading station and in the plant control system.

The FOG feed pumps and associated piping will also be electrically heated to a temperature of 110°F. Low suction pressure and high discharge pressure switches will be provided for each pump.

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4.5 Thermal Hydrolysis Pretreatment (THP)

This section will be developed after pre-selection of the THP supplier is completed.

4.5.1 Design Criteria

4.5.2 Proposed Improvements

4.5.3 Preliminary Control Descriptions

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4.6 Anaerobic Digestion

This subsection summarizes the proposed anaerobic digestion facilities at the Franklin WRF. The anaerobic digestion facilities will provide volatile solids reduction, which will reduce the total solids to be disposed of and provide useful renewable energy by providing biogas that can be used as a fuel in the combined heat and power (CHP) system.

4.6.1 Design Criteria

The proposed anaerobic digestion facility will receive hydrolyzed sludge from the thermal hydrolysis process. The anaerobic digester system is comprised of the equipment and structures listed in **Table 4.6-1**. The table also provides the general location for the equipment.

Table 4.6-1 Proposed Major Anaerobic Digester System Equipment and Locations

Equipment/ Structure	Location
Feed Pumps	Thermal Hydrolysis Process Area
Cooling System (temperature control)	Digester Building
Recirculation Pumps	Digester Building
Tanks	Digester Tanks
Tank Cover	Digester Tanks
Mixing Pumps	Digester Tanks
Digested Sludge Transfer Pumps	Digester Building
Rapid Rise Overflow Tank	Digester Tanks
Gas Collection and Storage	Digester Tanks, Digester Building and Gas Storage
Gas Conditioning	Biogas/CHP Equipment Pad

Under this project, anaerobic digestion facilities will be provided for 36,000 lb/day of hydrolyzed sludge. This is the projected mass of solids generated in the maximum month when the WWTP flow is 20 mgd. Space will be reserved on the site plan and inside the proposed Digester Building to accommodate solids production for an expanded WWTP treating flows up to 32 mgd. **Figure 4.6-1** provides the preliminary layout of the Digester Building.

Table 4.6-2 provides an overview of the design parameters used for sizing the facilities associated with the anaerobic digestion process.

Table 4.6-2 Anaerobic Digester Design Parameters (Average Day and Max. Month) at Design Conditions

Parameter	Average Day Condition	Maximum Month Condition
Solids Loading to Digesters	28,000 lb/day	36,000 lb/day
Solids Concentration in Digester Influent	8.6%	8.7%
Feed Volume to Digesters	39,000 gal/day	50,000 gal/day

The solids loading to the digesters listed in **Table 4.6-2** are hydrolyzed solids coming from the THP system. The hydrolyzed solids are a mixture of WAS and pre-dewatered and screened WAS, that has been treated in the THP system.

The solids concentrations listed in **Table 4.6-2** are based off of the assumption that the THP system

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will dilute the hydrolyzed sludge to 9 percent solids, which will be mixed with FOG at 4 percent solids, to achieve a digester feed of 8.6 and 8.7 percent solids for average day and maximum month conditions, respectively. These assumptions are based off of Kruger's earlier proposals. CAMBI dilutes their hydrolyzed sludge to a higher percent solids. To be conservative, the sizing of anaerobic digestion system is based on Kruger's percent solids values because they result in higher flows.

4.6.1.1 Digester Feed/Pressure Reducing Pumps

The general design criteria for the digester feed/pressure reducing pumps are summarized in **Table 4.6-3**. "Digester Feed Pumps" is the terminology used for the CAMBI system. "Pressure Reducing Pumps" is the terminology used for the equivalent equipment in the Kruger system.

Table 4.6-3 Proposed Digester Feed/Pressure Reducing Pump Design Criteria

Parameter	Value
Number of Pumps	2 (1 duty, 1 standby)
Type of pump	Progressing Cavity
Capacity Per Pump	60 gpm (to be finalized after selection of THP System Supplier)
TDH Per Pump	(to be finalized after selection of THP System Supplier)
Pumped Fluid	Hydrolyzed sludge (temperature and percent solids to be finalized after selection of THP System Supplier)
Motor Size	15 hp (Conservative estimate, to be finalized after selectrion of THP System Supplier)
Drive Type	Variable Speed
Manufacturers	Seepex
Model	Model N with Special H-5 Stator

4.6.1.2 Hydrolyzed Sludge Cooling System

A summary of the proposed hydrolyzed sludge cooling system is listed in **Table 4.6-4.**

Table 4.6-4 Proposed Hydrolyzed Sludge Cooling System Equipment

Parameter	Value
Number of Cooling Heat Exchangers	2, 1 duty 1 Standby
Heat Exchanger Type	Tube in Tube
Heat Exchanger Capacity (MMBTU)	(to be determined after selection of THP System Supplier)
Number of Digester Recirculation Pumps	2, 1 duty 1 standby
Capacity Per Pump (gpm)	(to be determined after selection of THP System Supplier)
TDH Per Pump (ft)	(to be determined after selection of THP System Supplier)
Pump Type	Chopper
Motor Size	7.5 HP (to be finalized after selection of THP System Supplier)
Drive Type	Variable Speed
Manufacturers	Vaughan, WEMCO
Number of Cooling Water Pumps	2, 1 duty 1 standby
Capacity Per Pump (gpm)	(to be determined after selection of THP System Supplier)
TDH Per Pump (gpm)	(to be determined after selection of THP System Supplier)
Pump Type	Centrifugal

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Parameter	Value
Motor Size	10 HP (to be finalized after selection of THP System Supplier)
Drive Type	Variable Speed
Manufacturers	Peerless, Goulds

4.6.1.3 Digester Tanks

General design criteria for the digester tanks are summarized in **Table 4.6-5**. The tanks are proposed to be constructed using prestressed concrete cylinder tanks, similar to the WAS Holding Tank. Alternate construction materials including cast-in-place (CIP) concrete and steel are also available. Prestressed concrete is selected for this application. Prestressed tanks are expected to have a lower initial cost to construct than CIP tanks. Prestressed tanks are also expected to have less maintenance requirements than steel tanks.

While a variety of cover styles and materials of construction are available, it is recommended the covers be fixed steel domes with pressure/vacuum relief. Minimal gas storage will be provided with the tank covers. Instead, the gas storage will be provided in a separate structure. To facilitate removal of the biogas from the tanks, the covers (and tanks) will be designed to operate at a slight positive pressure. The exact cover pressure will be determined in the next phase of design; however, it is expected the operating pressure will be 8 to 12 inches of water column.

Depending on the final operating pressure of the gas system, concrete dome covers, provided as an integral element of the tank, can be an economical alternative to steel covers.

Table 4.6-5 Proposed Anaerobic Digester Tank Design Criteria

Parameter	Value
Number of Digester Tanks	2 (plus 1 additional tank in the future)
Digester Temperature Range	Tank materials are designed for 110 deg F, Digester will be operated at 100 deg F
Solids Retention Time (SRT)	15 days (average day) 12 days (maximum month)
Digester Type	Cylindrical with sloped bottom
Materials of Construction	Prestressed Concrete
Type and Material of Cover	Fixed Steel
Tank Volume	375,000 gallons
Tank Diameter	40 feet
Tank Bottom Slope	0.10 (1 foot fall for 10 feet of run)
Depth of Bottom Cone	2 feet
Tank Side Water Depth	40 feet
Side Wall Depth	42 feet
Buried Side Wall Depth	5 feet
Manufacturers	CROM Corporation, Precon, DN Tanks or equal

4.6.1.4 Digester Mixing Equipment

Mixing equipment will be provided with each digester tank to maintain a uniform solids concentration throughout the tank. The mixing equipment will also be designed to scour the floor of each tank and

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prevent the accumulation of debris at the bottom. Another important component of the mixing system is controlling the buildup of scum on the surface of the each tank.

Two types of mixing systems have been considered for this project. A pumped mixing system is recommended for this application. Pumped mixing utilizes fixed or moveable nozzles on the floor and near the top of each tank to inject a recirculated flow. Draft tube mixers can be considered as an alternate. Draft tubes mixing includes tall cylinders with propellers installed inside the cylinder. The tubes can be internal or external to the tank. The propellers are designed to operate in both clockwise and counter-clockwise rotation to allow mixing from top to bottom and from bottom to top.

Hydrolyzed sludge is more dense than standard WAS and primary sludge. Therefore pumped mixing is recommended for this application because of the extra mixing energy it provides to move the more dense hydrolyzed sludge. It also provides for easier maintenance as the mixing equipment will be located at ground level.

General design criteria for the digester mixing system are summarized in **Table 4.6-6.**

Table 4.6-6 Proposed Digester Mixing System Design Criteria

Parameter	Value
Number of Pumps	3, 1 duty per digester and 1 standby for the system (plus an additional 1 in the future)
Type of Mixing System	Pumped Recirculation
Tank Turnover Time	20-30 min
Fluid Pumped	Digested Sludge (100 deg F, 5%-10% dry solids)
Capacity Per Pump	1,500 gpm
Pump Type	Centrifugal Chopper
Motor Size	40 HP
Drive Type	Variable Speed
Manufacturers	Rotamix by Vaughan, Jetmix by Evoqua

4.6.1.5 Digester Transfer Pumps

General design criteria for the digester transfer pumps are summarized in **Table 4.7-7.**

Table 4.6-7 Proposed Digester Transfer Pump Design Criteria

Parameter	Value
Number of Digester Transfer Pumps	2 - 1 duty, 1 standby
Type of pump	Progressing Cavity
Pumped Fluid	Digested sludge (100 deg F, 5.3% dry solids)
Capacity Per Pump	250 gpm
Motor Size	20 HP
Drive Type	Variable Speed
Manufacturers	Moyno, Netzsch, Seepex

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4.6.1.6 Rapid Rise Overflow Tank

General design criteria for the digester rapid rise overflow tank is summarized in **Table 4.6-8.**

Table 4.6-8 Proposed Rapid Rise Overflow Tank Design Criteria

Parameter	Value
Number of Rapid Rise Overflow Tanks	1 (plus 1 additional tank in the future)
Design Storage Capacity	56,000 gallons (15% of digester volume)
Tank Location	Between Digester 1 and Digester 2
Materials of Construction	Steel
Tank Dimensions	18 feet in diameter and 30 feet tall
Overflow Pipe Diameter from Digester	36 inches
Manufacturers	Tank Connection, AquaStore

4.6.1.7 Gas Collection, Storage Equipment, and Waste Gas Flare

Biogas generated in the anaerobic digesters provides a source of energy that is planned to be captured and utilized. Components of the gas collection system, storage system, and the waste gas flares are described in this section.

Gas collection will be through piping located at the center dome on the cover of each tank. A condensate and sediment trap will be provided for each tank. Additionally, drip traps will be located at the low points of the gas piping to facilitate removal of condensate from the pipeline. Gas piping is recommended to be 304 SS when exposed above ground. Gas piping is proposed to remain above ground to facilitate access for maintenance and cleaning.

A key element to utilizing the biogas produced is gas storage. Storage provides a buffer to reduce the pressure drop when gas utilization equipment is being operated. A storage system separate from the digester tanks provides the flexibility to take the storage system off-line without affecting the digester capacity. An at-grade, slab mounted, dual membrane storage system is proposed.

General design criteria for the digester gas storage equipment is summarized in **Table 4.6-9.**

Table 4.6-9 Proposed Digester Gas Storage Equipment Design Criteria

Parameter	Value
Number of Gas Storage Units	1 (plus 1 additional unit in the future)
Type of Gas Storage	Slab Mounted, Dual Membrane
Capacity Per Unit	33,500 cubic feet
Diameter of Unit	43 feet
Blower (Fan) Motor Size	5 HP (max)
Manufacturers	WesTech Duosphere, JDV

While the objective is to utilize all of the biogas produced in equipment designed to produce heat, power, or both, waste gas flares provide a final back-up for combustion of the biogas prior to exhaust. The flares will likely be required by the air permit for the facility. Two 8 inch 'candlestick' flares, each having capacity up to 16,000 ft3/hr are proposed, with one on duty and one on standby.

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4.6.1.8 Gas Conditioning System

While the quality of the biogas is still unknown, it is anticipated a gas conditioning system will be required to remove contaminants. A treatment system designed to reduce moisture, hydrogen sulfide, and siloxanes is proposed. All of the biogas produced will be consumed by the CHP system, therefore the gas conditioning system shall be sized to treat 100 percent of the gas flow from the anaerobic digestion process.

General design criteria for the digester gas conditioning system are summarized in **Table 4.6-10**.

Table 4.6-10 Proposed Digester Gas Conditioning System Design Criteria

Parameter	Value
Number of Gas Conditioning Systems	1
Design Gas Flow	144 scfm (231 scfm in the future)
Conditioning Targeting Removal of:	Hydrogen Sulfide, Moisture & Siloxane
Hydrogen Sulfide Removal Capacity	One Vessel - 231 scfm
Moisture Removal Capacity	One Filter – 231 scfm
Siloxane Removal Capacity	4 filters split into two parallel series – each filter is rated for 143 scfm
Manufacturers	Unison, others as equal
Total System Electrical Demand	5 HP

4.6.2 Proposed Improvements

4.6.2.1 Digester Feed/Pressure Reducing Pumps

The digester feed (CAMBI)/pressure reducing (Kruger) pumps are part of the THP pre-selection package and will be located either on the THP equipment pad (for the CAMBI system) or in the digester building (for the Kruger system). If a CAMBI system is installed, the digester feed pumps will convey hydrolyzed sludge from the pulper to the digester building's Digested Sludge Loop. If a Kruger system is installed, the pressure reducing pumps shall reduce the pressure in the pipeline directly upstream of the digesters. The excess pressure will convey the hydrolyzed sludge into the digesters.

The digester feed/pressure reducing pumps will be moving high solids at high temperatures. Positive displacement pumps, such as progressing cavity and rotary lobe, are the most common types of pumps used in this application. Since these pumps would be part of the THP system supplier's scope, both suppliers were queried on their preference; both prefer to use progressing cavity pumps manufactured by Seepex. This is in line with CDM Smith's preference, as the majority of installed pumps moving hydrolyzed sludge have been the Seepex progressing cavity models.

Pumps associated with the THP system are subject to stator damage due to the high temperature sludges being pumped. The Seepex Model N with the H5 stator has performed well with high temperature sludges on past CDM Smith THP jobs. CDM Smith is requiring Seepex model N progressing cavity pumps with a special H5 stator for all pumps handling hydrolyzed sludge.

If the duty digester feed/pressure reducing pump fails, it shall trigger an alarm and the PLC shall bring online the standby pump. The pumps will be oversized and operated on a VFD to allow it to handle increased flows in the future.

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4.6.2.2 Hydrolyzed Sludge Cooling System

The cooling system consists of cooling heat exchangers, and their respective sludge and water pumps. The cooling system will be as proposed by the selected THP manufacturer and will be provided as part of the THP vendor package. General design criteria will be determined by the THP manufacturer, as part of their process to cool the hydrolyzed sludge.

Due to the high concentration of solids, it is recommended that tube-in-tube heat exchangers be provided.

Though details will be decided after a THP system supplier has been selected, CDM Smith has determined that the hydrolyzed sludge will enter a digested sludge recirculation loop, which will dilute and cool the hydrolyzed sludge and keep the velocity up in the pipe. The digested sludge will be recirculated by two digester recirculation pumps, with one on duty and one on standby. The sludge recirculation loop will convey the blended sludge (hydrolyzed sludge and digester sludge) through the cooling heat exchanger system prior to feeding the blended sludge to a selected digester. In addition to the digester recirculation pumps, the heat exchanger system consists of one duty and one standby heat exchanger and two cooling water pumps, with one on duty and one on standby.

4.6.2.3 Digester Tanks

Two anaerobic digester tanks are proposed, each with approximate dimensions of 40-feet diameter by 40-feet tall, providing 375,000 gallons of digester volume. Space is reserved on the site for construction of a third tank to accommodate expansion at the WWTP.

Prestressed concrete tanks are proposed for construction of the digester tanks. The tank floor will have a 0.10 slope (1 foot fall for every 10 feet of run) to a low area to facilitate draining and cleaning. The floor and tank foundation are expected to be provided by manufacturer of the prestressed concrete tanks.

The steel cover of the digester tank will be insulated to limit heat losses. The portion of the digester walls that are partially buried will benefit from natural insulation from the surrounding soil.

4.6.2.4 Digester Mixing Equipment

The digester mixing equipment will keep the solids in the digesters in a constantly mixed, homogeneous state. Pumped recirculation and draft tube mixers were chosen as the two options to be evaluated. The pumped recirculation system was chosen because it provides more power to mix the denser hydrolyzed sludge, has the added ability to knock down scum and foam, and can be located on the ground to provide easier maintenance.

Each digester will have its own designated recirculation pump, with one standby pump for the whole digestion system. When a third digester is added to handle future flows, an additional pumped recirculation system shall be added.

4.6.2.5 Digester Transfer Pumps

The digester transfer pumps will be located in the digester building and will convey digested sludge from the digesters to the digested sludge storage tank adjacent to the Solids Processing Building. The variable speed driven pumps will transfer sludge out of an assigned digester at a rate that will maintain digested sludge velocity above 4 feet per second.

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There will be one duty and one standby transfer pump for the whole system. The pumps are oversized and operate on a VFD so they will be able to handle the increased flows associated with future expansion.

4.6.2.6 Rapid Rise Overflow Tank

Rapid rise is the term used to describe a specific foaming event that can cause large amounts of digested sludge to rise inside the digester.

In traditional digester configurations, the overflow from the digesters is routed back to the primary clarifiers or to the head of the secondary treatment train. A rapid rise event causes sludge to overflow at rates that exceed the capacity of traditional overflow conveyance systems; this leads to sludge spills. A rapid rise overflow tank is designed to capture digester overflows and recycle them back into the digestion process.

The overflow piping from the digesters will be routed into the rapid rise tank. The overflowed sludge will then be pumped back into the digester through the digester recirculation pumps.

The location and controls of the rapid rise tank will be revisited during subsequent design phases. For this report, it is assumed a single structure will serve both tanks with a future rapid rise tank to serve a future digester.

4.6.2.7 Gas Collection and Storage Equipment

Biogas generated within the digester tanks will be conveyed through condensate traps prior to heading to the biogas system. The collection system consists of a biogas storage membrane, a waste gas flare, and connections to the steam generating boiler system and the gas conditioning system. The gas conditioning system cleans the gas prior to it being used in the CHP system.

Gas will enter the system and either flow towards the boilers and CHP system (in times of high heating and/or electrical demand or low gas production) or flow to the gas storage and flare system (in times of low heating and/or electrical demand or high gas production).

If the CHP system is operating, the gas flow will be measured, and then flow through the gas conditioning system. If the CHP system isn't operating, the gas will flow to the backup boilers.

Excess gas will be captured in the storage membrane, and released back toward the CHP system under low biogas production conditions. Any excess gas that cannot be captured by the storage system will be flared.

4.6.2.8 Gas Conditioning System

The gas conditioning system consists of a hydrogen sulfide removal vessel, followed by a moisture removal train before finally passing through two parallel series of siloxane removing tanks.

There is some redundancy provided for siloxane treatment during phase 1 flows. However, if the gas conditioning system is down for any reason, the backup boilers will use the biogas from the anaerobic digestion system to provide steam for the THP system.

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4.6.3 Preliminary Control Descriptions

The following sections describe the planned operational modes and means of control for the proposed anaerobic digestion facility at the WRF. Process and Instrumentation Diagrams (P&IDs) for these facilities are provided in Section 11.

4.6.3.1 Digester Feed/Pressure Reducing Pumps

The variable speed driven digester feed pumps/pressure reducing pumps shall be controlled by the THP system supplier's PLC to convey dry solids out of the THP system at a rate equal to the mass flow of dry solids entering the THP system. The pumps will be one duty, one standby, with the duty pump running to failure. Upon failure of the duty pump the THP system supplier's PLC will alarm and automatically bring on the redundant pump.

If the CAMBI system is installed, the digester feed pumps discharge into the digested sludge recirculation loop inside of the digester building. If the digester recirculation pumps, which feed the recirculation loop, are off, an alarm will be triggered and the digester feed pumps shall turn off.

If the Kruger system is installed, the pressure reducing pumps control the flow by reducing the pressure in the pipeline directly prior to feeding into the digester.

4.6.3.2 Hydrolyzed Sludge Cooling System

The hydrolyzed sludge cooling system cools the hydrolyzed sludge to a temperature that is required to maintain the digester temperature at 100°F. The hydrolyzed sludge shall be fed into a digested sludge recirculation loop inside of the digester building. The recirculated digested sludge will dilute and cool the hydrolyzed sludge prior to conveying it through the cooling heat exchanger. The recirculated digested sludge will also keep the hydrolyzed sludge velocities in the feed pipe above 4 feet per second. After the blended sludge (hydrolyzed and digested) passes through the cooling heat exchanger, it is conveyed into a digester.

The low hydrolyzed sludge flows make it impractical to feed multiple digesters simultaneously while maintaining minimum required pipe velocities. Therefore, only one digester will be fed at a time. The plant PLC will have programmable input to determine the consecutive hours a digester will be fed until it switches to the adjacent digester. The PLC shall control motor actuated valves to ensure digested sludge is being withdrawn from the selected "feed" digester and sent through the digested sludge recirculation loop by a digester recirculation pump.

The hydrolyzed sludge will be fed into that loop, blended with the digested sludge, pass through the cooling heat exchanger, and be fed into the digester. The digester recirculation pump, the cooling water pump, and the heat exchangers all operate as one duty and one standby. An operator can manually change the designated duty equipment. The THP system supplier's PLC shall alarm if the duty fails; this will signal a plant operator to manually change the valves to allow the standby equipment to start operating.

At the end of a digester feed period, the "feed" digester shall stop receiving flow, and the adjacent digester shall become the "feed" digester. For the purpose of describing the transition, the digester whose feed cycle is ending shall be called Digester 1, and the digester whose feed cycle is beginning shall be called Digester 2. The transition for this period shall be as follows:

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1. Digester 2 motor operated valves shall open to allow digested sludge from Digester 2 to be conveyed to the digester recirculation pumps AND to allow blended sludge from the heat exchangers to be conveyed into Digester 2.

    a. At this point, the digested sludge being sent into the digested sludge recirculation loop is coming from both Digester 1 and Digester 2. At the same time, blended sludge from the heat exchangers is being sent into both Digester 1 and 2.

2. Once the Digester 2 motor operated valves are confirmed open, the Digester 1 motor operated valves shall close to stop digested sludge flow Digester 1 from being conveyed to the digester recirculation pump AND to stop blended sludge from the heat exchangers to be conveyed into Digester 1.

    a. At this point all of the sludge being sent into the digested sludge recirculation loop is coming from Digester 2. At the same time, blended sludge from the heat exchangers is being sent into Digester 2.

4.6.3.3 Digester Tanks

The digester tanks will be operated as continuous flow units; although the fill and withdrawal cycle will be intermittent for each tank. In-line instrumentation for temperature monitoring, gas pressure, pH, tank level, and alarms will be provided. Additionally, sampling locations will be installed at a variety of locations, including the tank cover and piping (influent, effluent, and recirculation). Sampling will allow operators to monitor the digesters for total solids, volatile solids, alkalinity, volatile acids, and ammonia as a minimum.

4.6.3.4 Digester Mixing Equipment

Digested sludge will be withdrawn from each digester and enter a suction header as depicted in the Digestion System P&ID in Section 11. The suction header has control valves that direct sludge from a given digester into its assigned recirculation pump.

The digester mixing pumps have variable speed motors and a flow meter downstream of the discharge side of the pump. The pump speed and operational running time shall be controlled by a standalone control panel (not controlled by the plant SCADA) that has an adjustable timer and PLC that can adjust the VFD to meet an operator inputted flow rate. The control panel will be able to communicate run confirms and alarms with the plant SCADA system. If a pump fails, an alarm will trigger and the pump will be cycled off. The operator will have to manually operate the valves in the field and reassign the standby pump to duty status.

After the flow meter, the pumped digested sludge pass through a discharge header before being directed into its assigned digester. In the digester, the flow is split to multiple discharge nozzles as designed by the digester pump mixing supplier. Similar to the suction header, the discharge header has valves to control which digester each digester mixing pump is discharging to.

4.6.3.5 Digester Transfer Pumps

The digested sludge leaving the digesters needs to equal the hydrolyzed sludge entering the digestion system. Due to low hydrolyzed sludge feed flows, digested sludge cannot be continuously withdrawn from the digesters while maintaining minimum pipe velocity (without installing a recirculation loop). Therefore, digested sludge will be transferred to the digested sludge storage tank on an intermittent basis.

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A minimum transfer flow will be set to ensure minimum velocities are met. The transfer period (time the pump will be transferring sludge out of the digestion system) will be a function of that minimum flow and the hydrolyzed sludge feed flow. This flow will be set either manually or programmed into the PLC.

The transferring of sludge out of a given digester shall occur when that digester is no longer being fed blended sludge.

If the duty pump fails for any reason, it shall trigger an alarm to the Plant SCADA. An operator will have to manually actuate valves to allow flow to pass through the standby pump, and reassign the standby pump to duty status for the alarm to turn off.

4.6.3.6 Rapid Rise Overflow Tank

The rapid rise overflow tank shall detect an overflow event by a level sensor in the overflow tank, a flow sensor in the overflow pipe, or both. This detection shall trigger an alarm in the PLC. The recycling of the overflowed sludge back into the digesters can be initiated by an operator or by a set program in the PLC.

The overflowed sludge shall be recycled back into the same digester it originated from. This will be accomplished by actuating the valves so that the flow feeding the digester recirculation pumps is coming from the rapid rise overflow tank and not the digester that overflowed. Once the level in the rapid rise overflow tank has dropped below a set point, the valves shall actuate so that the flow feeding the digester recirculation pumps is coming from the digester being fed and not the overflow tank.

4.6.3.7 Gas Collection, Storage Equipment, and Waste Gas Burner

The digester gas system will be designed to operate based on pressure. Although the exact operating pressure has not been determined, it is expected to be 8 to 12 inches of water column. The gas pressure will be determined based on manufacturer input during the final design of the storage membrane and the tank covers.

Pressure relief valves (and vacuum relief valves) will be installed on the digester covers to prevent over-pressurization and/or vacuum conditions. Two pressure/ vacuum relief valves are recommended for each cover.

A pressure regulating valve at the waste gas burner is another pressure control point for the gas system. The relief pressure for this valve is typically 0.5 inches water column less than the design operating pressure of the covers.

The gas storage system will be used to maintain a constant gas pressure to the utilization equipment. The setting of the storage system will be slightly lower than the setting on the relief valve to waste gas burner. Fans are used to control the pressure in the dual membrane storage system. By inflating the outer membrane, the inner membrane (storing the biogas) will see a nearly constant pressure.

4.6.3.8 Gas Conditioning Equipment

The gas conditioning equipment will be controlled using a local panel. The system will generally operate on pressure. As the demand for gas increases in the CHP system, the gas conditioning system will sense the pressure drop and adjust by opening throttling valves.

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4.7 Combined Heat & Power System

This section of the preliminary design report summarizes the purpose of the CHP facility, as well as its preliminary design conditions, costs, and savings.

4.7.1 Introduction to CHP

CHP is the use of an engine to simultaneously generate electricity and heat. While traditional power generation utilizes less than 50 percent of the thermal energy in fossil fuels in converting that energy to electricity, CHP technology provides power plants the capability to capture much of this "waste heat," producing cycle efficiencies that can reach 80 percent.

4.7.1.1 CHP Technologies

Traditional power generation converts a fossil fuel's thermal energy into electrical energy through the combustion process, the inefficiencies of which result in large quantities of waste heat released to the surroundings. CHP technologies include a number of methods for recovering this energy through heat exchangers, resulting in a useable source of heat to be distributed to the site.

4.7.1.1.1 High Grade Heat and Exhaust Energy

Much of the heat recovery comes from high temperature exhaust, called flue gas. While CHP prime movers, specifically gas turbines and reciprocating engines, produce electrical energy through the mechanical work created during combustion, the flue gas sent to the stack as a byproduct can exceed 900°F. Equipped with a heat recovery steam generator (HRSG), essentially a gas to water heat exchanger, this high grade thermal energy becomes valuable and can be transmitted to feed water until it vaporizes into steam to be used on site.

There are a number of ways to utilize the steam as an energy source. The first and simplest is direct heating, where the steam is sent to the facility's heat distribution system. If the heat distribution system runs on hot water, a steam to water heat exchanger is required. Steam energy can also be used to reduce a plant's electric load, either through steam turbine driven equipment (like pumps) or absorption chilling, which uses steam to drive the refrigeration process in the creation of chilled water for cooling rather than an electric compressor.

4.7.1.1.2 Low Grade Heat

CHP equipment has a number of other heat sources that can provide thermal energy. However, these sources are at lower temperatures, below the temperature in which water vaporizes into steam. In capturing this energy, a plant can either send the energy directly to a hot water distribution system or increase its feed water temperature to increase the steam production through the HRSG.

A reciprocating engine contains a number of low grade heat sources, including an intercooler, a lube oil cooler, and a jacket water heat exchanger. The intercooler removes the heat created during the compression stage of combustion. Typically around 150°F, this should be the first source of heat recovery. Next is the lube oil cooler, which removes the heat from the oil coolant, entering the engine near 155°F and leaving at 190°F. Lube oil cooling is also required in gas turbines. The last source of low grade heat is engine jacket water. Similar to the lube oil cooler, the jacket water cools the engine to prevent overheating. The jacket water heat exchanger then transfers the thermal energy from the jacket water loop to the makeup water before being sent back to the engine as coolant.

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4.7.1.1.3 Anaerobic Digestion and CHP

Since 1980, about 50,000 megawatts (MW) of CHP power has been installed in the United States. This growth has increased in recent years, as the recent dip in natural gas prices has local utilities, hospitals, and universities investigating methods to increase fuel efficiency while providing a good return on investment.

The feasibility of CHP for a facility is mainly dependent on its load profile, the site's electrical and thermal demands. Although electricity is inexpensively transmitted over long distances, thermal energy requires insulated piping, which is not only becomes cost prohibitive at great lengths, but also decreases in efficiency as heat is lost to the surroundings. When a facility's load profile fits a CHP application and the plant can reach 80 percent, however, producing instead of purchasing expensive electricity can provide a substantial savings and a large return on investment.

At the Franklin WRF, the load profile presents a clear match for the CHP. In the year 2018, the THP system demands 190 psig, saturated steam at a rate of 1,120 lb/hr. The hydrolyzed sludge is then digested, producing 81 ft^3/min (scfm) of biogas for use in the CHP to produce the electricity and steam to continue the cycle.

4.7.2 CHP Selection

CHP comes in a wide variety of shapes and sizes, each with their distinct advantages and disadvantages. Reciprocating engines are very electrically efficient, reaching 40 percent, but of the 45 percent recoverable thermal energy, only half is high grade heat. Gas turbines are less electrically efficient, ranging from 25 to 30 percent, but provide nearly 53 percent of the total energy as high grade exhaust. Generally, reciprocating engines provide a cost effective solution up to 5 MW, above which gas turbines are preferred.

Having analyzed the load profile at the Franklin WRF, CDM Smith determined that the steam demand was best suited for an engine in the 600-kilowatt (kW) range, and a Jenbacher JMS 312 engine was selected for further analysis in the CHP study. The JMS 312 energy balance data is shown in **Table 4.7-1** below.

Table 4.7-1 Jenbacher JMS 312 Energy Balance Data

CHP Loading	100%	75%	50%
Gas In (scfm/MBH)	164/5,886	127/4,572	91/3,259
Electricity Output (kW)	633	473	312
Steam Output (lb/hr, CAMBI/Kruger)	1,182/1,156	887/867	591/578

4.7.2.1 CHP Study

4.7.2.1.1 Background

Because two differing THP strategies have emerged, one the Kruger Exelys system utilizing 220 psig steam and the other by CAMBI at 190 psig, CDM Smith analyzed the economics of both processes. While both require saturated steam, the CAMBI technology demands 1.00 lb of steam to hydrolyze 1 lb of dry solids, while Kruger calls for 1.41, a 41 percent difference. In addition, the higher pressure of the Kruger process needs 2.5 percent more energy to produce each pound of steam.

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The CHP study examined the economic effects of these technologies, as well as two options for loading the engine: running the engine to produce the entire steam demand of the THP or to consume the biogas available from the digesters.

- **Scenario 1:** The CHP system is sized and loaded to produce the entire CAMBI steam demand.
- **Scenario 2:** The CHP system is sized and loaded to produce the entire Kruger steam demand.
- **Scenario 3:** The CHP system is sized and loaded to consume the digested biogas, producing steam for the CAMBI system.
- **Scenario 4:** The CHP system is sized and loaded to consume the digested biogas, producing steam for the Kruger system.

Scenarios 1 and 2 adjust the engine loading to meet the steam demand of the THP system, called "steam load following," while Scenarios 3 and 4 adjust the engine loading to consume 100 percent of the biogas produced in the digesters, called "biogas load following." It is important to note that engine loads are in reference to one engine; therefore 50 percent load requires one engine running at half load, while 150 percent has one at full load with an additional at half load. Firetube boilers, equipped with natural gas and biogas burners, are included to backup (Scenarios 1 and 2) or supplement the CHP steam production (Scenarios 3 and 4). **Table 4.7-2** outlines the equipment and design basis for this analysis.

Table 4.7-2 CHP Scenarios Analyzed

CHP Scenario	Design Basis Load Following, THP Process	Equipment Selection CHP Engine(s)	Boiler(s)
1	Steam, CAMBI	2 x JMS 312 Fuel: Biogas/Natural Gas	2 x 1,250 lb/hr Steam Production: 190 psig, saturated
2	Steam, Kruger	2 x JMS 312 Fuel: Biogas/Natural Gas	2 x 1,250 lb/hr Steam Production: 220 psig, saturated
3	Biogas, CAMBI	1 x JMS 312 Fuel: Biogas	3 x 1,250 lb/hr Steam Production: 190 psig, saturated
4	Biogas, Kruger	1 x JMS 312 Fuel: Biogas	3 x 1,250 lb/hr Steam Production: 220 psig, saturated

A full analysis of the THP and digestion processes from 2018 to 2040 can be found in **Appendix A.** There, it is clear that the digesters produce a fraction of the gas that is required to load the engine to produce the full THP steam load, about 65 percent of CAMBI and 45 percent of Kruger. As a result, Scenarios 1 and 2 require natural gas purchased from the local utility to be blended with the biogas to fuel the engine. Two firetube boilers, each rated at 50 percent of the THP maximum steam demand act as backup, allowing normal THP system operation during CHP maintenance or failure.

The approach of Scenarios 3 and 4, running the engine to consume the available biogas, requires only one engine. The firetube boilers, however, must supplement the CHP steam production during normal operation, and another unit is recommended to ensure plant capacity and reliability. Despite normal

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engine and boiler operation burning only biogas and natural gas, respectively, it is recommended to equip both engine and boiler burners with dual fuel capability, ensuring plant flexibility shall biogas become unavailable.

For more details regarding the design conditions and assumptions, refer to Appendix A.

4.7.2.1.2 Pricing

As expected, the steam load following and gas load following scenarios led in two divergent paths. Compared to their biogas load following cases, the CHP capacities were much higher in the steam load following cases, averaging over 50 and 120 percent higher engine loading for CAMBI and Kruger, respectively. This increased capacity came with a cost, of course, in the form of natural gas. In 2011, natural gas cost $7.83 per million British thermal units (MMBTU), roughly one-third of the equivalent cost of electrical energy at $0.095 per kilowatt-hour. Costs for both natural gas and electricity were expected to grow at an annual rate of 3 percent for the life of this study. Annual O&M costs were estimated at $0.016 per kWh, based on the United States Environmental Protection Agency's (USEPA's) CHP Project Development Handbook.

Because of the utility price difference, the added costs of natural gas are small compared to the electrical savings provided by generating on site. This tradeoff in gas to electricity costs is the basis for CHP.

In completing the economic analysis, the CHP's "First Cost" was estimated. This accounted for the upfront capital required to purchase, install, test, and commission the equipment, and also to construct the buildings to house them. Using the CHP Project Development Handbook for "total installed cost" and feedback from equipment suppliers, the first cost estimates for the engines were $1,650 per kW and the boilers were $150,000, each. The total installed cost includes equipment, installation labor and materials, engineering, project management, and financial carrying costs during the construction period. Because the engine and HRSG are expected to be installed in outdoor enclosures, the costs of the CHP Plant space were isolated to outdoor pads projected at $600 per cubic yard. Based on vendor provided footprints of 40 ft x 8 ft and 30 ft x 10 ft for the engine and HRSG, respectively, these expected costs are $100,000. Space costs associated with the water treatment, deaerator, and two auxiliary boilers are incorporated in the digester building costs.

4.7.2.1.3 Analysis and Results

The complete CHP study calculations are included as Appendix A, with a summary of overall project incomes and expenses, as well as cost breakdowns for three representative years (2018, 2030, and 2040) provided in **Table 4.7-3**. This section of the report will analyze the data and results of each Scenario.

<u>Scenario 1</u>

The CHP load in Scenario 1 was set to 73 percent in 2018. This required 4,461 thousand BTU per hour (MBH) (4,461,000 BTU/hr) of gas, of which only 2,915 MBH (65 percent) of biogas came from the digesters. The supplemental natural gas, at a rate of $9.63 per MMBTU, cost the CHP $130,000 for the year, and another $64,000 were added for CHP O&M costs. Due to the electrical savings of $455,000, however, the CHP provided $260,000 in 2018 alone.

The economic advantages grew as the capacity of the WRF increased through the life of the study. In 2040, the facility more than doubled its capacity, demanding twice as much steam for the THP and

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creating twice as much biogas from the digesters. That year the engine was loaded to 153 percent, meaning that one engine would be at full load while the other was at 53 percent, and annual costs of natural gas and O&M were $514,000 ($18.45/MMBTU) and $135,000, respectively, nearly three and a half times those from 2018. The higher electricity production provided a savings of $1,832,000 and a net savings of $1,183,000.

Over the life of the study, the CHP in Scenario 1 is expected to provide just over $12 million, and regain its $2.4 million first cost investment in its eighth year of operation, 2025.

Scenario 2

As discussed previously, the Kruger Exelys THP system requires more than 40 percent more thermal energy to produce the same results as the CAMBI THP. Despite this efficiency reduction, the economics remain comparable, albeit slightly less favorable, due to the increased loading of the CHP.

In 2018, the CHP demanded a 106 percent loading (two engines at 53 percent) to generate the steam demand. The annual natural gas costs were more than double those of Scenario 1 in 2018, totaling $328,000, and O&M costs were also higher at $92,000. With electric savings at $653,000, the net savings was $232,000, only ten percent less than that from Scenario 1.

Despite this slightly lower initial value, the net savings in Scenario 2 grew at a much quicker rate than Scenario 1. By 2026, Scenario 2's net value exceeded $515,000 compared to $441,000 in Scenario 1.

That growth continued until 2040, when both engines were fully loaded and the net value exceeded $1.3 million.

Scenario 2 is expected to provide $13,566,000 in total savings with a payback year of 2025.

Scenario 3

Unlike the previous cases, the Scenario 3's CHP was biogas load following, which significantly reduced its capacity. The reduction in electrical savings was mitigated by the decreased cost of natural gas, which efficiently produced the remaining steam in the aux boiler at a rate of 80 percent. Also, less CHP capacity required only one engine, decreasing the first costs by nearly $1 million.

Starting in 2018, the engine was loaded to 43 percent, producing 270 kW and about 60 percent of the steam required for the CAMBI CHP. The other 40 percent steam was produced in the auxiliary boilers, requiring 509 MBH of natural gas at an annual cost of $43,000. The lower electrical production provided annual savings of $267,000, netting $186,000 after included the O&M costs of $38,000.

The engine loading grew until 2040, when it produced 660 kW and 1,232 lb/hr (78 percent) of the required steam. That year the net savings increased to just over $1 million. Scenario 3's lifecycle profit reached only $10,718,000, significantly less than Scenarios 1 and 2. However, the lower capital costs associated with this case resulted in a payback year of 2024, making this option desirable if lower capital costs are prioritized.

Scenario 4

While the economics effects of the less efficient Kruger Exelys THP system were minimized in Scenario 2 due to an increase in CHP loading, Scenario 4 included none of those benefits. The THP's biogas production was determined by the Franklin WRF incoming flow, which were the same for each

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Scenario. As a result, the CHP loading in Scenario 4 was equal to Scenario 3. But the increase in steam energy demand in Kruger's system required more than double the natural gas in the auxiliary boilers. The result is an equal value in electrical savings and O&M costs, but with over twice the natural gas costs. Thus, it is clear that this option is not preferred.

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Table 4.7-3 Economic Evaluation Summary

CHP Governor		Steam		Gas	
Scenario- THP Process		1- CAMBI	2- Kruger	3- CAMBI	4- Kruger
Estimated CHP Capital Costs ($)		($2,489,000)	($2,713,000)	($1,639,000)	($1,639,000)
Payback Year		2025	2025	2024	2025
Lifecycle Profit		**$12,056,000**	**$13,566,000**	**$10,718,000**	**$8,322,000**
2018	Biogas Gas Generated (MBH)	2,915	2,915	2,915	2,915
	CHP Natural Gas Purchased (MBH)	1,545	3,894	0	0
	Aux Boiler Natural Gas Purchased (MBH)	0	0	509	1,050
	CHP Steam Generated (lb/hr)	861	1,220	514	502
	Aux Boiler Steam Generated (lb/hr)	0	0	348	718
	Electricity Generated (kW)	459	660	270	270
	Annual Natural Gas Costs ($)	($130,000)	($328,000)	($43,000)	($89,000)
	Annual CHP O&M Costs ($)	($64,000)	($92,000)	($38,000)	($38,000)
	Annual Electricity Savings ($)	$455,000	$653,000	$267,000	$267,000
	Total Savings ($)	**$260,000**	**$232,000**	**$186,000**	**$140,000**
2030	Biogas Gas Generated (MBH)	4,652	4,652	4,652	4,652
	CHP Natural Gas Purchased (MBH)	2,722	5,460	0	0
	Aux Boiler Natural Gas Purchased (MBH)	0	0	688	1,554
	CHP Steam Generated (lb/hr)	1,375	1,947	904	885
	Aux Boiler Steam Generated (lb/hr)	0	0	470	1,062
	Electricity Generated (kW)	729	1,064	483	483
	Annual Natural Gas Costs ($)	($327,000)	($657,000)	($83,000)	($187,000)
	Annual CHP O&M Costs ($)	($102,000)	($149,000)	($68,000)	($68,000)
	Annual Electricity Savings ($)	$1,035,000	$1,510,000	$685,000	$685,000
	Total Savings ($)	**$605,000**	**$704,000**	**$535,000**	**$431,000**
2040	Biogas Gas Generated (MBH)	6,109	6,109	6,109	6,109
	CHP Natural Gas Purchased (MBH)	3,179	6,776	0	0
	Aux Boiler Natural Gas Purchased (MBH)	0	0	838	1,977
	CHP Steam Generated (lb/hr)	1,805	2,557	1,232	1,205
	Aux Boiler Steam Generated (lb/hr)	0	0	573	1,352
	Electricity Generated (kW)	964	1,402	660	660
	Annual Natural Gas Costs ($)	($514,000)	($1,095,000)	($135,000)	($320,000)
	Annual CHP O&M Costs ($)	($135,000)	($196,000)	($93,000)	($93,000)
	Annual Electricity Savings ($)	$1,832,000	$2,664,000	$1,255,000	$1,255,000
	Total Savings ($)	**$1,183,000**	**$1,373,000**	**$1,027,000**	**$843,000**

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Conclusions

The CHP's lifespan economic analysis results were shown in Table 4.7-3. With two engines and two boilers, the capital costs of Scenarios 1 and 2 are nearly $1,000,000 more than Scenarios 3 and 4, which require three boilers but only one engine. However, the added capital costs of the increased engine capacity are counteracted by the electrical savings, and Scenarios 1 and 2 yield more than an additional million dollars over the life of this study.

Differentiating between Scenarios 1 and 2 is a matter of preference between lifecycle profit and cycle efficiency. It is obvious that Scenario 1's CAMBI system is more efficient, requiring less energy to satisfy the system demands. Scenario 2, on the other hand, provides an additional $1.5 million in savings due to its increased engine loading and electrical production.

The economic advantages of Scenario 2 are heavily affected by the volatile utility market, where current natural gas prices are reaching record lows. Should gas prices rise, or electricity prices drop (less likely), the more efficient CAMBI THP system in Scenario 1 would provide the most savings. For those reasons, Scenario 1 is recommended as it provides an efficient method of providing millions of dollars in value to the WRF throughout the duration of this study.

4.7.3 CHP Operation

Once the CHP is selected and installed, it becomes the responsibility of the plant operator to ensure the functionality of the system. The control system is designed to adjust the CHP operation as conditions fluctuate, from steam demand and gas production fluctuations to changes in the ambient environment. Also, major equipment requires preventative maintenance and scheduled outages to ensure their reliability. This section will discuss these considerations and effects.

4.7.3.1 CHP Control System

Despite the study in Section 4.7.2.1 assuming a steady state having constant steam demand and biogas production, fluctuations are expected to be managed via a central control system. In fact, the reciprocating engine was selected not only because it provides a good fit for the system demands, but also because its technology allows for greater flexibility in loading.

While gas turbine technologies are typically limited to running above 50 percent because loading any less results in incomplete combustion and higher emissions, the reciprocating engine limit is as low as 6 percent. Also, the engine efficiency stays relatively flat at throughout its entire load. By contrast, the gas turbine efficiency can decrease by as much as ten, from 35 percent at full load to 25 percent at half load. Because the contents and volume of wastewater flow into the Franklin WRF are expected to vary, and the heat required to maintain the digester temperature (approximately 95°F) swings with the ambient temperature, the THP steam demand will likely fluctuate significantly. For this reason, the engine is a superior CHP technology for this application. **Figure 4.7-1** displays part load efficiencies of reciprocating engines and gas turbines. The specific brands and equipment vary, but the general trends hold true for both technologies.

In addition to adjusting the engine load, the control system will also have to regulate the steam conditions and ensure that the engine does not overheat. Steam conditions are monitored by the "plant master," a pressure transmitter on the steam distribution header that controls the steam flows in (from the HRSG) and out (to the THP). As the THP demands steam, the header pressure drops and the plant master demands more feedwater to the HRSG while simultaneously increasing the load on

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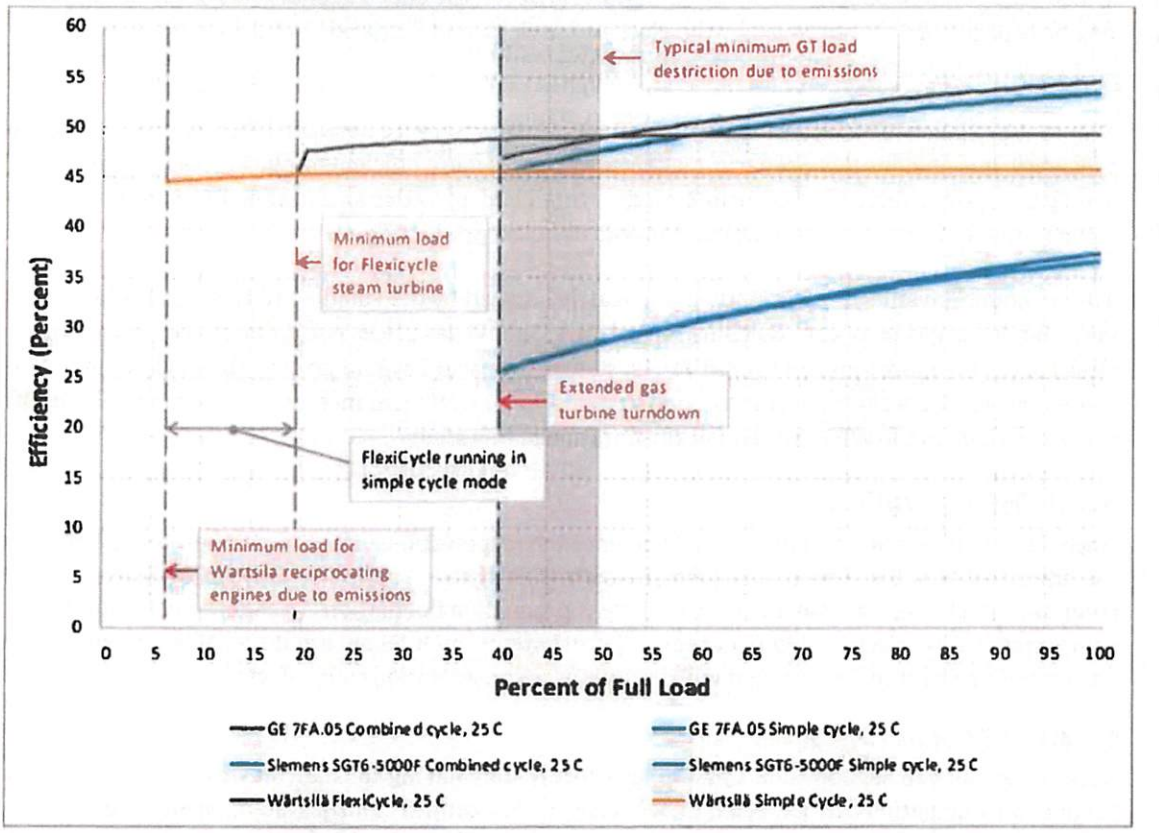
the engine to supply heat in the form of exhaust gas to generate the required steam. When the steam demand to the THP decreases, the plant master will see an increase in pressure, decrease the feedwater flow, and unload the engine.

Figure 4.7-1 Part Load Efficiency of Engines and Gas Turbines



The engine heat recovery system, which provides the CHP with "waste heat," is made up of a number of closed loops that must reject heat from the engine to prevent overheating, whether or not there is an application to use the heat. At full load, the intercooler, lube oil cooler, and jacket water cooler must remove 461 MBTU/hr, 276 MBTU/hr, and 672 MBTU/hr, respectively. Initially, this energy will increase the temperature of reclaimed make-up water through heat exchangers. However, the maximum steam demands only provide about one-fourth (7 gpm) of the cold water flow to fully remove the heat from these loops. For this reason, another 20 gpm of cold water will be sent through the engine heat recovery system, delivering another source of energy for another heating application on site.

Should the cold water not provide enough heat removal, the radiators supplied by the engine vendor will activate, and the cooling will be provided by ambient air being passed over the hot pipes by the radiator fans. This operation is not preferred, however, because the heat is lost as it is rejected to the atmosphere and additional electrical energy is required to drive the radiator fans. Any heat not recovered by the HRSG will simply be exhausted through the stack to atmosphere.

Water treatment is required to ensure feedwater is of boiler quality, specifically by removing hardness and sodium that, at higher boiler pressures, can corrode metal or accumulate on heat exchange

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surfaces and reduce their effectiveness. A carbon filter removes chlorine, and dissolved organic material from the makeup water stream through granular activated carbon resin, and those removed particles must be purged when they begin to block the fluid flow. The filters should be expected to be replaced periodically.

Water softeners remove "hardness" in the water, which use ion exchange resin to reduce mineral scale in the feedwater supply. Hardness ions in the water, mainly calcium and magnesium that precipitate on the metal surfaces of pipes or boilers, are replaced with sodium ions from the resin. When the softener's resin has been exhausted of its sodium, it must be regenerated, during which flow will be redirected to the other softener while water is pumped from the nearby brine tank to replace the sodium. The brine tank should be expected to be refilled periodically.

The feedwater, now appropriately soft but having elevated sodium levels, must be sent through a reverse osmosis (RO) unit before it can be considered "boiler quality." Unlike the carbon filter and softeners, the RO is constantly rejecting 25 percent of the water containing 99 percent of the impurities. RO membranes require periodic replacement, and four feet of space is required on both sides of the skid for membrane removal.

As the RO operates on differential pressure, it assumes an atmospheric outlet pressure, which is provided by a vented storage tank containing a volume of two hours of steam flow. An RO water pump must then be provided to drive the flow to the HRSG.

CHP plants require a boiler plant operator on site, who shall verify the operation of the boiler plant and control system while also conducting rounds to visual inspect the plant and its equipment. Although Williamson County does not regulate the qualifications of the boiler plant operator, it is recommended that the operator be a licensed fireman due to the presence of the combustion process and potential hazards present within the facility.

4.7.3.2 Engine Maintenance

To ensure the smooth operation of the engine and CHP, frequent maintenance is required. Whether planned or unplanned, most models predict maintenance outages to account for five percent of the engine's operating time. During these down times, the backup auxiliary boiler systems will be activated.

Scheduled maintenances are expected every 1,000 to 2,000 operating hours to replace consumables like oil, filters, and spark plugs. Intermediate services occur every 10,000 hours to inspect the equipment, such as pistons and cylinder heads.

Overhauls, recommended every 60,000 operating hours, are the most complete form of engine maintenance, where the entire engine is inspected and serviced with specialized machinery to ensure its continued operation. They often require a long period of down time and come at a significant expense.

Due to all of these engine maintenance requirements, vendors provide Long Term Service Agreements (LTSAs), which act as a form of insurance where the purchaser will pay a steady rate, covering scheduled and intermediate services, as well as major and minor overhauls. Parts and labor are included in most LTSAs, as is unscheduled maintenance when troubleshooting engine trips and other unplanned outages. For most applications, especially those with operators who are inexperienced in

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CHP operation, these LTSAs provide the service and knowledge to ensure the longevity of CHP equipment.

4.8 Post-Digestion Dewatering (Post-Dewatering)

Post-digestion dewatering (hereinafter referred to as post-dewatering) is the second of two dewatering steps in the proposed solids treatment train. In this dewatering step, screw presses remove water from the digested, hydrolyzed sludge before it is transferred to the solar dryer.

4.8.1 Design Criteria

The design criteria for the post-dewatering system are listed below in **Table 4.8-1.**

Table 4.8-1 Design Criteria – Post-Dewatering System

Parameter	Value
Digested Biosolids Storage Tank & Mixer	
Location	Adjacent to Solids Processing Building
Tank Type	Bolted, painted steel
Tank Capacity	24,000 gallons
Material Stored	Anaerobically digested, hydrolyzed biosolids (5% to 6% solids)
Mixer Type	Top-mounted, vertical shaft
Mixer Motor Horsepower	2 HP
Tank Manufacturers	Aquastore or equal
Mixer Manufacturers	Chemineer, Philadelphia Mixer or equal
Post-Dewatering Screw Press Feed Pumps	
Location	Solids Processing Building First Floor
Pump Type	Progressing cavity
Number of Pumps	Phase I: Two (one duty, one standby) Ultimate: Three (two duty, one standby)
Pump Capacity (each)	5 to 50 gpm
Pump TDH (approx.)	40 feet
Pump Motor Horsepower (each) (approx.)	15 HP
Pumped Fluid	Anaerobically digested, hydrolyzed biosolids (5% to 6% solids)
Manufacturers	Seepex, Moyno, Netzsch or equal
Post-Dewatering Screw Presses	
Location	Solids Processing Building Second Floor
Dewatering Technology	Inclined screw press
Number of Units	Phase I: Two (one duty, one standby) Ultimate: Three (two duty, one standby)
Solids Capacity (each)	1,200 lbs dry solids/hour
Hydraulic Capacity (each)	5 to 50 gpm
Cake Solids	20% to 30%
Polymer Consumption	20 to 30 lbs active/DT
Minimum Solids Capture	95%
Motor Horsepower	5 HP

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Parameter	Value
Manufacturers	Huber Technology or equal
Post-Dewatered Cake Conveyance	
Dewatered Solids Conveyance	Enclosed, shaftless screw conveyor
Number of Conveyors	One (common to all three presses)
Materials of Construction	Stainless steel
Manufacturers	Spirac or equal

4.8.2 Proposed Improvements

Digested, hydrolyzed biosolids from the anaerobic digesters will be transferred to the digested biosolids storage tank. This tank, which is sized to provide eight hours of storage at ultimate design flows, will include a top-mounted, vertical-shaft mixer to keep the solids in suspension. The post-dewatering feed pumps will draw from this storage tank, accept inline injection of an aluminum sulfate (alum) and polymer solutions to aid in phosphorus removal and flocculation, and deliver the sludge/alum/polymer mixture to the post-dewatering screw presses on the second floor. The post-dewatering polymer system is described in Section 4.11. The alum feed system is described in the January 2013 PDR.

Dewatered cake from the screw presses will drop into one of two enclosed screw conveyors serving all three presses. Two conveyors will be provided so that loading of trucks can continue while one conveyor is out of service for maintenance or repair. A diverter gate on each screw press discharge will direct the dewatered cake to one conveyor or the other. Both conveyors will discharge to a truck in the post-dewatering truck bay. Multiple cake discharge points above the trucks are recommended, as the dewatered cake will not level itself easily. Once the truck is full, the truck driver will haul the load of dewatered cake to the solar dryer. In the time it takes to pull one truck out of the truck bay and bring an empty truck into the bay, the discharge gate on the conveyor may simply close to prevent dewatered cake from falling onto the floor, or a small hopper may be provided at the conveyor discharge to provide a few minutes' worth of storage until an empty truck can be positioned below the conveyor.

Odor control will be provided for the post-dewatering truck bay. A traveling bridge crane will be provided for maintenance of the screw presses. The post-dewatering room will be open to the post-dewatering truck bay, enabling plant staff to transfer equipment to and from the truck bay.

Because alum will be added for phosphorus removal, CDM Smith does not expect struvite formation in post-dewatering filtrate piping to be a major concern. However, if the City elects not to feed alum to the process year-round or if struvite deposits should become a problem, it may be necessary in the future to add a phosphorus removal system. The site layout will allow space in or adjacent to the Solids Processing Building for addition of a building to house the phosphorus removal equipment.

4.8.3 Preliminary Control Descriptions

The plant control system will enable the operator to select the duty and standby screw presses and their respective feed pumps. The control system will start the digested biosolids feed pumps, polymer feed pumps, and the dewatered cake conveyor. The digested biosolids feed pumps' speed will be adjusted to suit the screw press speed, and the polymer feed pumps' speed will be flow paced to the sludge feed rate in order to ensure a consistent dose of polymer.

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Low level in the digested biosolids storage tank will trigger an alarm in the plant control system and subsequently shut down the active feed pumps and polymer feed pumps. The active screw presses will begin their shutdown and CIP sequence.

Similar to the pre-dewatering cake conveyors, zero speed detection, motor overload, or motor over-torque at the dewatered cake conveyor will also trigger an alarm in the plant control system and shut down the screw presses and their sludge and polymer feed pumps. Limit switches on the conveyor covers will shut down the conveyor if one is opened.

4.9 Solar Drying

Following post-dewatering, the dewatered solids can be further dried in solar drying chambers. These large, ventilated greenhouse structures utilize solar radiation and mechanical mixing to produce a dried product with a solids content of 75 percent or more. The dried product bears a resemblance to soil and is considered to be more marketable than dewatered biosolids.

4.9.1 Design Criteria

The design criteria for the solar drying system are listed below in **Table 4.9-1.**

Table 4.9-1 Design Criteria – Solar Drying System

Parameter	Value
Location	West of Solids Processing Building & Digester Building
Type of Solids to Be Dried	Dewatered, thermally-hydrolyzed, anaerobically-digested biosolids
Solids Throughput	Phase I: Up to Ultimate:
Dewatered Sludge Solids Content	20% to 30%
Dried Sludge Solids Content (typical)	75% to 80%
Number of Drying Chambers	Phase I: Two Ultimate: Up to 12
Drying Chamber Dimensions	Approx. 45' W x 360' L (varies by manufacturer)
Total Motor Horsepower per Chamber (approx.)	35 to 50 without odor control
Loading & Unloading Methods	Manual (by City staff)
System Manufacturers	Infilco Degremont, Parkson Corporation, Kruger, Huber Technology or equal

4.9.2 Proposed Improvements

Per discussions with the City, the desired initial installation of solar dryers will be a "pilot" installation consisting of two drying chambers. The goals of a "pilot" installation are to allow City staff to determine the efficacy of solar drying under local climatic conditions, as well as to allow time for the City to assess the market demand for a solar dried biosolids product. This hands-on research will ultimately allow the City to decide the size and scope of a future expansion of the solar drying facilities at the Franklin WRF.

All of the systems under consideration consist of a greenhouse installed upon a concrete foundation. The greenhouse structures will be designed by the solar dryer system vendor based on the prevailing

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building code requirements, and the foundation will be designed by CDM Smith. Greenhouse materials vary from tempered glass to clear polycarbonate and polyvinyl chloride (PVC) panels. A climate-controlled, prefabricated enclosure adjacent to the drying chambers may be required to house electrical and control panels.

No conveyances will be provided to transfer the dewatered cake from the Solids Processing Building to the solar dryer, or to remove the dried biosolids from the drying chambers. CDM Smith assumes that City staff will bring the dewatered biosolids to the solar dryer via City trucks, load the drying chambers with the aid of a front-end loader, and use the front-end loader to remove the material and load it into trucks. However, CDM Smith recommends standardizing the means by which the drying chambers are loaded with dewatered biosolids. Trucks bringing dewatered cake from the Solids Processing Building will dump the cake into a hopper that would distribute the cake to each chamber at a depth that is suitable for spreading by the dryer's automated tilling machine.

It is CDM Smith's understanding that the City intends to contract with a third-party distributor to pick up and dispose of the Class A dried product. The perimeter of the drying facility will be paved for ease of access all around the chambers. A biosolids pick-up area consisting of a concrete pad with short walls, will be used for loading of the third-party distributor's trucks. This pick-up area will be located within the same secure area used for FOG unloading. If the FOG trucks will be weighed on a scale before and after deliveries, then the same scale could be used to measure the quantity of biosolids that will be hauled away.

The solar drying system will be included in the Franklin WRF Modifications and Expansion project bid documents as two additive alternates. The first additive alternate will consist of the "pilot" installation of two drying chambers. The second additive alternate will be the full solar drying system, sized to handle the plant's entire Phase I solids production. Depending on the bid pricing that is submitted, the City may select either additive alternate, or none at all. If no solar dryers are constructed, then it is assumed that the City will contract with a third-party distributor to receive the Class A dewatered cake at the Solids Processing Building and haul the material to local farms, where it will be land for land application.

Odor control is not included with the solar drying system, as sludges that have been hydrolyzed and anaerobically digested are far less odorous compared to undigested sludges. Should the need for odor control become apparent during operation of the "pilot" solar dryer installation, it can be added at a later date. Space and provisions for the addition of odor control will be included in the site design.

4.9.3 Preliminary Control Descriptions

Each drying chamber will be equipped with exhaust fans and motorized louvers to control the flow of air inside the greenhouse structures. Temperature and humidity instruments will monitor the air and adjust the fan speeds and louver positions to optimize the drying process.

Automated tilling machines will mix the solids and speed the drying process. These tilling machines can take the form of a rotating scoop or multi-bladed rotor that spans the entire width of the chamber, a narrower machine that forms the solids into windrows, or a roving vehicle with paddles attached to the drive axles.

Failure of a drying system component, such as the tilling machine, air control louvers, or fans, will trigger an alarm in the plant control system.

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4.10 Odor Control

To control odorous air emissions from the new biosolids processes, the following sources will be ventilated and treated in a central odor control system.

- Solids Processing Building
  - Post-Dewatering Room
  - Sludge Screenings Bin Room
  - Liquid & solids discharge chutes from pre-dewatering centrifuges
  - Sludge Pumping & Cake Storage Room
  - Pre- & Post-Dewatering Truck Bays
- WAS Storage Tank
- FOG Storage Tank

4.10.1 Design Criteria

4.10.1.1 Odorous Compounds and Concentrations

Solids and wastewater contain an array of odorous compounds (or odorants), which can be grouped into the key categories shown in **Table 4.10-1**. The table also shows the primary sources of these odorants associated with solids and wastewater.

Table 4.10-1 Solids and Wastewater Odorants

Odorant	Examples	Dominate
Hydrogen Sulfide		▪ Sewer systems ▪ Wastewater treatment systems ▪ Sludge holding, thickening, dewatering and stabilization
Organic Sulfur Compounds	▪ Dimethyl Sulfide ▪ Methyl Mercaptan ▪ Carbon Disulfide	▪ Sludge holding, thickening, dewatering and stabilization
Nitrogen Compounds	▪ Ammonia ▪ Amines ▪ Skatole ▪ Indole	▪ Wastewater anoxic basins ▪ Sludge digestion (anaerobic, ATAD) ▪ Sludge lime stabilization
Volatile Fatty Acids	▪ Acetic Acid ▪ Butyric Acid ▪ Valeric Acid	▪ Gravity thickeners ▪ ATAD
Aldehydes and Ketones	▪ Acetaldehyde ▪ Methyl Ethyl Ketone ▪ Acetone	▪ Sludge holding, thickening, dewatering and stabilization

As shown in the table, hydrogen sulfide is common to many wastewater and solids processes, however, in different proportions. Wastewater odors will have a high proportion of H_2S as compared

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to organic reduced sulfur compounds, such as methyl mercaptan and dimethyl sulfide. In contrast, solids processing odors will include some H_2S with a greater proportion of organic reduced sulfur compounds than odors. H_2S is nonetheless a focal point of many solids process odor control designs because H_2S can be accurately measured and even logged over several days. For design purposes of this biosolids facility, the odor control system will be designed to treat concentrations of both hydrogen sulfide and organic reduced sulfur compounds as well as some of the other odorants listed above. The reduced sulfur compounds will be listed as "total reduced sulfur" compounds.

The biosolids facility is new, and therefore, no sampling or testing can be done to accurately anticipate the concentration loading for the new odor control treatment system. Based on past sampling and testing efforts at similar treatment facilities, the following concentration assumptions will be made to design the odor control system.

- Hydrogen Sulfide – Average: 5 ppm, Peak: 25 ppm
- Total Reduced Sulfur Compounds – Average: 5 ppm, Peak: 10 ppm
- Other (Fatty Acids, Aldehydes, Ketones) – Average: 2 ppm, Peak 5 ppm

4.10.1.2 Ventilation Rates

Each source will be ventilated continuously to the odor control system. To determine the rate at which each source will be ventilated, National Fire Protection Association (NFPA) 820 code (2012 edition) was followed as guidance. Where no ventilation rate was stated or required by the code, six air changes per hour (ACH) was used as a standard.

Post-Dewatering Room

The Post-Dewatering Room is located on the second floor of the new Solids Processing Building and contains three screw presses. The proposed room is approximately 48-ft by 41-ft with 20-ft ceilings. The room is 39,360 cubic feet in volume. At 6 ACH, the airflow from this source is approximately 3,940 cubic feet per minute (cfm).

Sludge Screenings Bin Room

The Sludge Screenings Bin Room is located on the first floor of the new Solids Processing Building and contains open bins into which the three enclosed screens above discharge. The proposed room is approximately 16-ft by 46-ft with 20-ft ceilings. The room is 14,720 cubic feet in volume. At 6 ACH, the airflow from this source is approximately 1,470 cfm.

Pre-Dewatering Centrifuge Chutes

The four pre-dewatering centrifuges are located in the Pre-Dewatering Room on the second floor of the new building. These centrifuges are enclosed. They have liquid and solids discharge chutes where odorous air can be emitted and are typically ventilated from these locations. The liquid discharge chutes are recommended to be ventilated at a rate of 200 cfm for a total of 800 cfm. The solids discharge chutes are recommended to be ventilated at a rate of 175 cfm for a total of 700 cfm.

Sludge Pumping & Cake Storage Room

The Sludge Pumping and Cake Storage Room is located on the first floor of the new Solids Processing Building and contains open cake storage from the centrifuges above. The proposed room is approximately 45-ft by 60-ft with 20-ft ceilings and a small annex around the adjacent Sludge

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Screenings Bin Room. The room is 58,480 cubic feet in volume. At 6 ACH, the airflow from this source is approximately 5,850 cfm.

Pre- & Post-Dewatering Truck Bays

The Pre- and Post-Dewatering Truck Bays are located on the south side of the Solids Processing Building allowing for the loading of sludge from both the Pre- and Post-Dewatering Rooms. The Pre-Dewatering Truck Bay is approximately 34-ft by 18-ft with 40-ft ceilings resulting in a volume of 24,480 cubic feet. The Post-Dewatering Truck Bay is approximately 48-ft by 18-ft with 40-ft ceilings resulting in a volume of 34,560 cubic feet. At 6 ACH, the airflow from both truck bays is approximately 5,900 cfm.

WAS Storage Tank

The WAS Storage Tank is located to the east of the new Solids Processing Building. The proposed tank is approximately 45-ft in diameter. The tank has a side wall of 24-ft. To ensure that odorous air is captured under all operating conditions, the airflow is calculated assuming an empty tank. The empty tank is 38,170 cubic feet in volume. At 6 ACH, the airflow from this source is approximately 3,820 cfm.

FOG Storage Tank

The FOG Storage Tank is located to the west of the new Solids Processing Building. The proposed tank is approximately 15,000 gallons in capacity. To ensure that odorous air is captured under all operating conditions, the airflow is calculated assuming an empty tank. The empty tank is 2,005 cubic feet in volume. At 6 ACH, the airflow from this source is approximately 200 cfm.

Table 4.10-2 summarizes the sources and airflows to be treated in the odor control system.

Table 4.10-2 Ventilation Rates for Odor Control System

Source	Volume	Ventilation Rate	Airflow
Post-Dewatering Room	39,360 ft^3	6 ACH	3,940 cfm
Sludge Screenings Bin Room	14,720 ft^3	6 ACH	1,470 cfm
Pre-Dewatering Centrifuge Chutes	NA	6 ACH	1,500 cfm
Sludge Pumping & Cake Storage Room	58,480 ft^3	6 ACH	5,850 cfm
Pre- & Post-Dewatering Truck Bays	59,040 ft^3	6 ACH	5,900 cfm
WAS Storage Tank	38,170 ft^3	6 ACH	3,820 cfm
FOG Storage Tank	2,005 ft^3	6 ACH	200 cfm
TOTAL			**22,680 cfm**

4.10.2 Proposed Improvements

4.10.2.1 Treatment Technologies

Two types of odor control systems were evaluated. These include biofiltration, and wet chemical scrubbing. Both of these technologies have the capability of treating a wide range of odorous compounds typically seen in solids processing facilities. Each technology has been described below in more detail.

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Biofiltration

In the biofiltration process, air is passed through an organic and/or inorganic media that supports a population of microorganisms. The pollutants in the air stream are absorbed onto the media, where microorganisms feed on them in an aerobic environment. While the biological reactions are complex, it is safe to say that simpler and less odorous compounds are formed in the process.

Nutrients, to support biological growth, may be available in the organic media or may have to be supplied if inorganic media is used. The air must be warm and should be humidified for effective biofiltration. Biological performance decreases sharply when the air temperature is below 55 degrees Fahrenheit (°F) and essentially ceases at 40°F. Air collected from highly ventilated tank headspaces will essentially be at the same temperature as the outside air. Therefore, some systems require an air heater to raise the temperature to acceptable levels and almost all systems provide a means of humidification before the air enters the biofilter. A VFD fan is recommended for the biofiltration systems to accommodate the change in the pressure drop across the biofilter as media compaction takes place over time.

Two discrete biological processes take place during the biofiltration process. H_2S is converted to sulfuric acid, and organic compounds are oxidized. H_2S removal will cause the pH of the media to drop, eventually inhibiting the oxidation of organics. The media has a finite life and must be replaced after either the pressure drop increases to a point where the fan will not properly operate or the environment becomes unfit for microbial growth. The environment can also become unfit by a loss of critical nutrients required to sustain growth or a change in the system parameters such as a large drop in pH.

Biofiltration can be accomplished by vendor-supplied, package biofilters for low capacity (5,000 cfm or less) odor control systems. For higher capacity systems, "built-in-place" type biofilters are more cost-effective. These systems entail a concrete vessel that will include a humidification chamber, air distribution plenum, biofilter media support grating, inorganic and organic media stages and will be protected from the elements by fiberglass-reinforced plastic (FRP) covers. Biofilter media will provide adequate retention time for microbes to react with odorous contaminants. The media has to be irrigated with water and nutrients (phosphorus and nitrogen) to maintain the moisture content of the media.

Wet Chemical Scrubbing

In a wet chemical scrubber, odorous air is passed counter-current to chemicals in a tower filled with chemical-resistant packing. The packing provides the required surface area for mass transfer of odorous contaminants from the vapor phase to the liquid phase. Since the solubility of H_2S increases with pH, sodium hydroxide (NaOH) is added to the recirculating chemical solution to maintain a pH of around 10. Sodium hypochlorite (NaOCl) is added to oxidize the dissolved sulfide and prevent it from re-entering the air stream. Chemical storage tanks need to be provided for NaOH and NaOCl. These tanks need to be insulated and heat traced to prevent freezing. Secondary containment should be provided either by using double wall tanks or by providing concrete containment capacity. Chemical feed, using metering pumps, is controlled by feedback from probes measuring pH and oxidation-reduction potential (ORP). Automatic water make-up and blowdown is provided to control the liquid levels in the chemical scrubber sumps. A chevron demister is included at the outlet of the chemical scrubber to remove any entrained droplets before clean air is exhausted from the scrubber.

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4.10.2.2 Evaluation

Both technologies are capable of reducing odors from solids processing facilities. The majority of sources to be treated will be rooms within the facility, and therefore, the concentrations and subsequent pollutant loading rates to the odor control system will be significantly less than if it were from all enclosed spaces. In addition to these lower concentrations, the solids being processed will not be continuous, and biofiltration systems work most efficiently when the pollutant loadings are constant. Chemical scrubbing systems can adjust the chemical addition for treatment when pollutant loading rates are lower or higher. It is recommended that a multi-stage chemical scrubber system, sized to treat 23,000 cfm be used for odor control at the new biosolids facility. **Table 4.10-3** presents the design criteria for the odor control system.

The odor control system will be located east of the Solids Processing Building. CDM Smith recommends locating the chemical tanks and pumps indoors to protect them from freezing.

Table 4.10-3 Design Criteria for Odor Control System

Parameter	Value
Maximum Capacity	23,000 cfm
Vessel Type	Multi-stage chemical scrubber
Fan	Constant speed- 50 HP
Recirculation Pumps	15 HP each
Chemical Feed Pumps	<1 HP
Chemicals Used	Sodium Hydroxide (Caustic Soda), 25% Sodium Hypochlorite, 12.5%

4.10.3 Preliminary Control Descriptions

As discussed in Section 4.10.2, the multi-stage wet scrubber will include instrumentation for measurement of pH and ORP. The control system will automatically adjust the delivery rate of the NaOH and NaOCl metering pumps in response to signals from the pH and ORP probes. The scrubber vessels will include differential pressure and level switches. Air flow switches in the exhaust fan ductwork will detect a loss of air flow and trigger an alarm in the plant control system.

The recirculation and chemical metering pumps will be equipped with low suction pressure and high discharge pressure switches, which will trigger an alarm and shut off the affected pump.

The storage tanks for NaOH and NaOCl will be equipped with level sensors. The truck unloading station for each tank will include a level display and alarm that will sound upon high level. A level switch will be provided inside each chemical containment area (regardless of whether it is the interstitial space of a double wall tank or a concrete containment sump) to trigger an alarm if leakage of chemical occurs.

4.11 Supporting Facilities

4.11.1 Management of Process Drainage

The proposed solids treatment process is expected to generate a substantial quantity of wastewater that will be returned to the head of the plant for treatment. The majority of this process drainage is expected to be filtrate from the pre- and post-dewatering processes. Other contributors to process drainage include wastes from regeneration of the water softening resins, as well as washdown water

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from the pre- and post-dewatering equipment's automated cleaning sequence. **Table 4.11-1** lists the anticipated process drainage quantities.

Left untreated, the digested sludge is expected to contain a significant amount of phosphorus. Rather than returning this phosphorus to the head of the plant, alum will be applied to the digested sludge prior to post-dewatering in order to precipitate the phosphorus and remove it in the post-dewatering process. The alum feed system is discussed in the January 2013 PDR.

Tie-in of the solids treatment facilities' process drains to the Franklin WRF's existing drain system is discussed in Section 5.

Table 4.11-1 General Design Criteria – Solids Process Drainage System

Parameter	Value
Contributors	Including, but not limited to: ▪ Pre-dewatering centrate ▪ Pre-dewatering centrifuge washdown ▪ Post-dewatering filtrate ▪ Post-dewatering screw press washdown ▪ Wastes from water softening & RO systems ▪ Wastes from THP system[1] ▪ Seal water & cooling water drains ▪ Area washdown throughout plant
Flow Rate (approx.) (without THP waste streams[1])	Phase I (Year 2023): ▪ Average Day: 341,000 gal/day ▪ Maximum Month: 443,000 gal/day Ultimate (Year 2040): ▪ Average Day: 489,000 gal/day ▪ Maximum Month: 636,000 gal/day

[1] To be determined following selection of THP system supplier.

4.11.2 Polymer Storage & Feed Systems

Polymer storage and feed systems will be provided for both the pre-dewatering and post-dewatering processes.

4.11.2.1 Design Criteria

Table 4.11-2 lists the general design criteria for both polymer storage and feed systems.

Two completely separate systems will be provided to allow for the use of different polymer products and solution concentrations for pre- and post-dewatering. However, the City may elect to standardize on a single emulsion polymer if bench-scale test results indicate that it is possible to do so.

Tables 4.11-3 and 4.11-4 provide specific design criteria for the pre- and post-dewatering polymer storage and feed systems, respectively.

At present, equipment sizing for the pre-dewatering polymer system is based on polymer consumption rates for both of the possible pre-dewatering design conditions (16 and 22 percent cake

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solids) described in Section 4.3. The design criteria in Table 4.11-2 will be refined after the THP supplier is selected.

Table 4.11-2 General Design Criteria – Polymer Storage & Feed Systems

Parameter	Value
Systems' Location	Solids Processing Building First Floor
Containment Volume Design	At least 110% of largest tank capacity plus 12 inches of sprinkler water
Neat Polymer Characteristics & Storage	
Type of Polymer	Liquid emulsion
Emulsion (Neat) Polymer Density (assumed)	8.7 lbs/gallon
Neat Polymer Activity (assumed)	30% to 40%
Days of Storage	At least 14 days at maximum month conditions
Polymer Solution Characteristics & Storage	
Polymer Solution Activity	0.25% to 0.50%
Polymer Solution Density (assumed)	8.34 lbs/gallon
Dilution Water Quality	Protected water (primary source) Plant reuse water (backup source)
Polymer Solution Aging Time	30 to 60 minutes

Table 4.11-3 Design Criteria – Pre-Dewatering Polymer Storage & Feed System

Parameter	Value
General Design Criteria	
Anticipated Polymer Consumption	16% Cake Solids: 12 to 20 lbs active/DT 22% Cake Solids: 20 to 30 lbs active/DT
Pre-Dewatering Neat Polymer Storage Tanks	
Number of Tanks	Phase I: One tank Ultimate: Two tanks
Tank Type	Single wall, vertical crosslinked polyethylene (XLPE) with domed top & mixer
Tank Capacity (each)	16% Cake Solids: 1,600 gallons 22% Cake Solids 2,500 gallons
Days of Storage	Phase I: 14 days at max month Ultimate: 18 days at max month
Mixer Type	Top mounted, vertical shaft mixer or progressing cavity recirculation pump
Mixer Motor Horsepower (each)	TBD
Tank Manufacturers	Poly Processing, Snyder Industries or equal
Vertical Shaft Mixer Manufacturers	Chemineer, Philadelphia Mixer or equal
Recirculation Pump Manufacturers	Moyno, Netzsch, Seepex or equal
Pre-Dewatering Polymer Dilution System	
Number of Units	Two (1 duty, 1 standby)
Neat Polymer Feed Rate	50 to 100 gal/hour
Dilution Water Feed Rate	10 to 100 gpm

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Parameter	Value
Manufacturers	VeloDyne, Prominent or equal
Pre-Dewatering Polymer Aging Tanks	
Number of Tanks	Phase I: One tank Ultimate: Two tanks
Tank Type	Single wall, vertical crosslinked polyethylene (XLPE) with open top & mixer
Tank Capacity (each)	16% Cake Solids: 1,000 gallons 22% Cake Solids 1,500 gallons
Minimum Solution Aging Time	16% Cake Solids: 41 minutes 22% Cake Solids 36 minutes
Mixer Type	Top bracket mounted, vertical shaft
Mixer Motor Horsepower (each)	1 HP
Tank Manufacturers	Poly Processing, Snyder Industries or equal
Mixer Manufacturers	Chemineer, Philadelphia Mixer or equal
Pre-Dewatering Polymer Solution Feed Pumps	
Pump Type	Progressing cavity
Number of Pumps	Phase I: Three (2 duty, 1 standby) Ultimate: Four (3 duty, 1 standby)
Pump Capacity (each)	1 to 15 gpm
Pump TDH (approx.)	70 feet
Pump Motor Horsepower (each) (approx.)	5 HP
Pumped Fluid	Pre-Dewatering Polymer Solution, 0.25% to 0.5%
Manufacturers	Seepex, Moyno, Netzsch or equal

Table 4.11-4 Design Criteria – Post-Dewatering Polymer Storage & Feed System

Parameter	Value
General Design Criteria	
Anticipated Polymer Consumption	20 to 30 lbs active/DT
Post-Dewatering Neat Polymer Storage Tanks	
Number of Tanks	Phase I: One tank Ultimate: Two tanks
Tank Type	Single wall, vertical crosslinked polyethylene (XLPE) with domed top & mixer
Tank Capacity (each)	2,000 gallons
Days of Storage	Phase I: 16 days at max month Ultimate: 14 days at max month
Mixer Type	Top mounted, vertical shaft mixer or progressing cavity recirculation pump
Mixer Motor Horsepower (each)	TBD
Tank Manufacturers	Poly Processing, Snyder Industries or equal
Vertical Shaft Mixer Manufacturers	Chemineer, Philadelphia Mixer or equal
Recirculation Pump Manufacturers	Moyno, Netzsch, Seepex or equal
Post-Dewatering Polymer Dilution System	

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Parameter	Value
Number of Units	Two (1 duty, 1 standby)
Neat Polymer Feed Rate	50 to 100 gal/hour
Dilution Water Feed Rate	10 to 100 gpm
Manufacturers	VeloDyne, Prominent or equal
Post-Dewatering Polymer Aging Tanks	
Number of Tanks	Phase I: One tank Ultimate: Two tanks
Tank Type	Single wall, vertical crosslinked polyethylene (XLPE) with open top & mixer
Tank Capacity (each)	1,250 gallons
Minimum Solution Aging Time	35 minutes
Mixer Type	Top bracket mounted, vertical shaft
Mixer Motor Horsepower (each)	1 HP
Tank Manufacturers	Poly Processing, Snyder Industries or equal
Mixer Manufacturers	Chemineer, Philadelphia Mixer or equal
Post-Dewatering Polymer Solution Feed Pumps	
Pump Type	Progressing cavity
Number of Pumps	Phase I: Two (1 duty, 1 standby) Ultimate: Three (2 duty, 1 standby)
Pump Capacity (each)	1 to 15 gpm
Pump TDH (approx.)	70 feet
Pump Motor Horsepower (each) (approx.)	5 HP
Pumped Fluid	Post-Dewatering Polymer Solution, 0.25% to 0.5%
Manufacturers	Seepex, Moyno, Netzsch or equal

4.11.2.2 Proposed Improvements

The pre- and post-dewatering polymer systems will be located on the first floor of the Solids Processing Building. The systems will be in separate concrete containment areas, with separate truck unloading stations for each system. The truck unloading stations will be equipped with a small containment sump below the fill connection, as well as a high tank level alarm.

Each containment area will have a two-foot-tall wall. Stair access to the two containment areas will be provided.

Storage of neat polymer will be in vertical, crosslinked polyethylene tanks with top-mounted, vertical shaft mixers or a pumped recirculation system using progressing cavity pumps. Operators will typically run the mixers for a short time every few days to keep the emulsion mixed and prevent stratification. The polymer dilution systems will draw neat polymer from the tanks, mix it with dilution water, and deliver the solution to one of two aging tanks, where gentle mixing will be applied to fully activate the polymer. The polymer solution feed pumps will draw solution from the aging tanks and deliver it to the sludge feed piping via an inline mixer provided by the dewatering equipment manufacturer. Protected (non-potable) water will be the primary source of polymer

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dilution water, with plant reuse water available as a backup source in the event that protected water becomes unavailable.

In order to provide a continuous supply of aged polymer solution to the dewatering process, the solution will be made up in batches. At the start of an operating day, operators will make up a batch of solution in the No. 1 aging tank and allow it to age for at least 30 minutes. When dewatering begins, the polymer solution feed pumps will draw from the No. 1 aging tank. While the polymer solution pumps are draining the No. 1 tank, a batch will be made up in the No. 2 aging tank. When the No. 1 tank has been depleted, the polymer feed pumping system will switch over to the aged solution in the No. 2 tank. Polymer solution batches will thus be made up in alternating tanks until the end of the operating day.

The neat polymer tanks will be vented to the outside.

4.11.2.3 Preliminary Control Descriptions

Prior to the start of an operating day, operators will start the polymer dilution system and make the first batch of polymer solution and allow it to age at least 30 minutes. The polymer feed pumps will be called to run by the dewatering control system and will be flow paced to the sludge feed rate in order to ensure a consistent dose of polymer. One polymer feed pump will be dedicated to each sludge feed pump. The pumps will be equipped with low suction pressure and high discharge pressure switches.

During normal dewatering operation, low level in the No. 1 aging tank will prompt the control system to open the solenoid valve on the No. 2 aging tank discharge, then close the solenoid valve on the No. 1 aging tank. The polymer dilution system will then be called to run and make up a batch of solution in the No. 1 aging tank. The system will alternate between the two aging tanks through the use of the solenoid valves.

Low level in the neat polymer tank will trigger an alarm in the plant control system and stop the polymer dilution system if it is running. Low level in the aging tank that is feeding the polymer solution pumps will, as described above cause the system to switch over to the other aging tank. A low level in both aging tanks will trigger an alarm and shut off the polymer feed pumps. High level in an aging tank will shut off the polymer dilution system.

The containment areas and truck unloading stations will each be provided with emergency shower/eye wash stations. Activation of one of these stations will trigger an alarm.

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Section 5
Civil/Site Work

5.1 Existing Site

The site chosen for the biosolids improvements is located west of the existing plant site in the predominantly unimproved field south of the existing tree line and north of Claude Yates Drive. The biosolids facilities will lie north of the existing solar array and east of an existing gravel overflow parking area for the sports facilities located to the west. The biosolids structures are located outside of the 1 percent annual probability (100-year) floodplain; however, a portion of the biosolids site lies within the 0.2 percent annual probability (500-year) floodplain.

The area proposed for the biosolids facilities slopes gently from south to north, with a large, flat, low area along the north side adjacent to the tree line. Based upon the USGS 3 meter digital elevation model (DEM) for the area, this large area flat area represents a closed depression, which may indicate the presence of a sinkhole or karst geology. The topographic relief across the proposed site is approximately 21 feet. The site is currently unimproved open grassland; therefore, demolition of existing facilities will not be required.

Figure 5.1-1 is a preliminary site plan showing the relative location, size, and orientation of proposed biosolids facilities in relation to the existing plant site. Please note that the exact size and location of the facilities shown are subject to further refinement as the design progresses.

5.2 Paving, Grading & Drainage

Due to the substantial topographic relief across the site, a significant amount of earthwork will be required to prepare the site for construction of the biosolids facilities. Although some variation in finished elevations across the site can be accommodated, a significant amount of cut will be required along the south side of the site. The possibility of rock excavation may also exist to due to the amount of cut anticipated.

Over 3,000 linear feet of new roadway is expected to accompany the development of the biosolids facilities. The roadways will be constructed of 24-foot-wide, heavy-duty asphalt pavement for two-way traffic. Roadway alignments will be designed to accommodate WB-40 turning movements with 45-foot minimum radii used at street intersections. Roadways will be designed with extruded concrete curb edge treatments.

Storm drainage from the site will be collected in a combination of open swales and ditches and storm sewer piping and directed to on-site storm water detention facilities to be designed in accordance with the City's Stormwater Management Ordinance. It is anticipated that the stormwater detention facilities will be located in the low area south of the tree line.

5.3 Site Piping

The following is a list of known piping anticipated at this time.

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- WAS force mains from the two WAS pump stations to the sludge screens at the Solids Processing Building.
- Gravity flow of screened WAS from the sludge screens to the WAS storage tank.
- Pre-dewatering centrifuge feed pump suction from the WAS storage tank to the pre-dewatering feed pumps on the first floor of the Solids Processing Building.
- Post-dewatering feed pump suction from the digested biosolids storage tank to the post-dewatering feed pumps on the first floor of the Solids Processing Building.
- Biogas piping from the anaerobic digesters to the biogas storage system and the waste gas flare.
- Steam, biogas and hot water piping between the digester gas storage and conditioning areas at the Digester Building to the CHP system and the THP system.
- Digested sludge transfer from the Digester Building to the digested biosolids storage tank.
- Numerous sludge feed, recirculation and withdrawal pipes between the anaerobic digesters and the digester building.
- FOG piping from the FOG feed pumps to the Digester Building.
- Buried and exposed foul air ductwork from the WAS storage tank and the Solids Processing Building to the odor control system.
- Potable and plant reuse water piping service to the solids facilities.
- Alum feed tubing from the alum storage and feed system to the first floor of the Solids Processing Building.
- Numerous process drains throughout the solids facilities. These drains will combine and will ultimately be returned to the head of the treatment plant. It is anticipated that a single drain line from the solids treatment facilities will connect to an existing manhole located to the south of the existing solids treatment odor control system. Preliminary analysis by CDM Smith indicates that sufficient capacity exists in this line to handle the process drainage from the new solids facilities.

The exact size and location of proposed piping is subject to further refinement as the design progresses through the final phase of the project.

5.4 Erosion & Sediment Control

All erosion protection and sediment control measures will be designed according to the Best Management Practices (BMPs) of the City of Franklin and the Tennessee Department of Environment & Conservation (TDEC). Erosion and sediment control will be designed upon completion of the site grading plan.

5.5 Landscaping & Revegetation

Revegetation in areas of disturbance will be accomplished by reapplication of topsoil, soil enrichment, seeding, and straw mulch. Steep slopes may require additional stabilization measures such as erosion

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control blankets or matting. In order to minimize site maintenance, no trees or shrubs are proposed for this project. Limits of revegetation will be determined upon completion of the site grading plan.

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Insert Figure 5.1-1

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Section 6
Architectural

6.1 Architectural Codes & Design Standards

The City adopted the 2012 International Building Code (IBC) and the 2012 International Existing Building Code on March 1, 2014. Section 6 of the January 2013 PDR is hereby amended to reference the current design codes for the structural design of the liquid treatment and biosolids facility improvements.

6.2 Solids Processing Building

The Solids Processing Building's basic character and primary materials will be concrete post and beam frame system with a CMU-block infill and brick veneer two-story building. The roof construction will consist of a precast double tee system with low-slope built up roofing system. CMU block will present an aesthetically pleasing, yet economical facility on the plant site. Horizontal bands of translucent panels and/or windows will be incorporated to allow for natural day-lighting of the interior spaces. Exterior aluminum personnel doors will complete the exterior building envelope.

The interior will be composed of painted CMU walls. The floors will be sealed concrete, and there will be a suspended acoustical ceiling in any electrical rooms.

6.3 Digester Building

The Digester Building's basic character and primary materials will be CMU-block and brick veneer one-story building. The roof construction will consist of a precast double tee system with low-slope built up roofing system. As with the Solids Processing Building, CMU block will present an aesthetically pleasing yet economical facility on the plant site. Horizontal bands of translucent panels will be incorporated to allow for natural day-lighting of spaces. Exterior aluminum personnel doors will complete the exterior building envelope.

The interior will be composed of painted CMU walls. The floors will be sealed concrete, and there will be a suspended acoustical ceiling in any electrical rooms.

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Section 7
Structural

New structures and modifications to existing structures identified in Section 4 of this PDR will be designed in accordance with the structural codes and design standards in Section 7.1.

7.1 Structural Codes & Design Standards

7.1.1 Building Code

The City adopted the 2012 IBC and the 2012 International Existing Building Code on March 1, 2014. Section 7.4.1 of the January 2013 PDR is hereby amended to reference the current design codes for the structural design of the liquid treatment and biosolids facility improvements.

7.2 Design Loads

Design criteria presented in Section 7.5 of the January 2013 PDR apply to the biosolids facilities, with the following modifications or additions.

- 7.5.2.2 Floor Live Loads
  - Elevator machine rooms 300 psf
- 7.5.2.4 Impact Loads
  - Elevator Supports: 100 percent of the total reaction to the supports.
- 7.5.3 Environmental Loads
  - The proposed structures for the wastewater treatment plant are designated as non-essential facilities in accordance with the governing code.
  - Risk category: III
- 7.5.3.2 Wind Loads

  The change in the governing code results in the following changes to the wind loads for the liquid treatment and biosolids facility improvements.
  - Ultimate design wind speed: 120 mph
  - Nominal design wind speed: 93 mph
  - Importance factor: 1.00
- 7.5.3.3 Seismic Loads

  The change in the governing code results in the following changes to the seismic loads for the liquid treatment and biosolids facility improvements.
  - Seismic Design Category: D
  - Site Class: D

7.3 Foundation Design

Design criteria presented previously in Section 7.6 of the January 2013 PDR apply to the biosolids facilities.

7.4 Concrete Design

Design criteria presented previously in Section 7.7 of the January 2013 PDR apply to the biosolids facilities.

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7.5 Masonry Design

Design criteria presented previously in Section 7.8 of the January 2013 PDR apply to the biosolids facilities.

7.6 Structural Metal Design

Design criteria presented previously in Section 7.9 of the January 2013 PDR apply to the biosolids facilities.

7.7 Performance Specification Design

Design criteria presented previously in Section 7.6 of the January 2013 PDR apply to the biosolids facilities.

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Section 8
Heating, Ventilation & Air Conditioning

Heating, ventilation, and air conditioning (HVAC) design is used during the design of buildings to ensure the appropriate environmental conditions are maintained during the daily operation of the facility. The WRF expansion will include HVAC design for all new structures identified during design.

8.1 HVAC Codes & Design Standards

The applicable codes for HVAC design shall include the following:

- 2012 International Building Code with Amendments
- 2012 International Existing Building Code with Amendments
- 2012 International Mechanical Code with Amendments
- 2012 International Fire Code with Amendments
- 2012 International Fuel Gas Code with Amendments
- 2009 International Energy Conservation Code with Amendments
- 2012 National Fire Protection Association (NFPA) Life Safety Code 101
- 2009 ICC A 117.1 Accessible and Useable Buildings and Facilities
- Applicable State of Tennessee Regulations
- Occupational Safety and Health Administration (OSHA)
- NFPA 820 Standard for Fire Protection in Wastewater Treatment and Collection Facilities
- NFPA 90A Standard for the Installation of Air-Conditioning and Ventilating Systems
- All other applicable National Fire Protection Association (NFPA) Standards
- American Society of Heating, Refrigeration, and Air Conditioning (ASHRAE) Handbooks
- Air Conditioning and Refrigeration Institute (ARI)
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Duct Manuals
- Air Moving and Conditioning Association (AMCA)
- Recommended Standard for Wastewater Facilities (10 States Standards)
- The International Building Codes, NFPA 820 and other applicable NFPA standards, and the International Energy Conservation Code are the applicable codes of the local jurisdiction. The 10-State standard is a widely accepted industry design standard.

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NFPA 820 was developed based on fire and/or explosion incidents at wastewater facilities that are infrequent, but relatively severe when they do occur. The provisions of this standard apply to all new installations, and any new additions or modifications to existing facilities. The provisions of this standard are not retroactive to facilities, equipment, structures, or installations that existed prior to the effective date of the standard, unless the Authority Having Jurisdiction (AHJ) determines that the existing situation presents an unacceptable degree of risk. The AHJ also has the authority to modify the application of NFPA 820 to existing situations if it is clearly impractical to apply the provisions of the standard strictly.

8.2 Solids Processing Building

8.2.1 Administrative Areas

Administrative areas (control room, offices, lab, Storage/Library, toilets, etc) will be heated and cooled to maintain a temperature between 75°F summer and 70°F winter indoor temperature. A nighttime setback will be provided, 85°F summer and 68°F winter, that will be field adjustable. A minimum of 20 cubic feet per minute (cfm) of outside air per person will be introduced into the administrative area HVAC system.

Toilet areas will be ventilated as required by code.

Laboratory areas will be provided with fume and canopy hoods if required by final design.

8.2.2 Process Areas

Process areas covered under the scope of NFPA 820 will be provided with ventilation systems as required by NFPA 820 to provide the lowest possible electrical hazard possible.

The primary ventilation for the Solids Building (Sludge Pumping & Cake Storage, Sludge Screening Bin, Dewatering, and Sludge Screening Rooms) will be provided by the odor control system. The building HVAC systems will be coordinated with odor control system to provide the required ventilation, and tempered make-up air. No humidity control is to be provided.

Areas classified under NFPA 820 (Sludge Pumping & Cake Storage, Sludge Screening Bin, Dewatering, and Sludge Screening Rooms) will be ventilated at 6 or 12 air changes per hour based on the applicable requirements for the specific area. Additional ventilation will be provided, if required, to maintain a maximum temperature rise of 10°F above ambient conditions within the space caused by heat generating equipment. Heating systems will be provided to maintain a minimum temperature of 50°F±5°F, unless otherwise required by the specific process. No humidity control is to be provided.

Non-hazardous process areas not covered under the scope of NFPA 820 (Polymer Rooms) will be ventilated with outside air at a minimum rate of 6 air changes per hour (intermittent) utilizing exhaust fans. Additional ventilation will be provided, if required, to maintain a maximum temperature rise of 10°F above ambient conditions within the space caused by heat generating equipment. Heating systems will be provided to maintain a minimum temperature of 50°F±5°F, unless otherwise required by the specific process. No humidity control is to be provided.

8.2.3 Electrical Equipment Rooms

Electrical rooms will be cooled to maintain operation of electrical equipment and reduce the heat and humidity effects on the electrical equipment. The cooling design condition shall be a maximum

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temperature of 80°F. For electrical rooms containing equipment essential to plant operation, such as variable frequency drive (VFD) rooms, redundant air conditioning systems will be provided. Heating systems will be provided to maintain a minimum temperature of 50°F. Temperature/trouble alarms shall be provided to alert plant operators if temperatures rise or fall outside of required operating ranges.

8.3 Digester Building

8.3.1 Process Areas

Process areas covered under the scope of NFPA 820 will be provided with ventilation systems as required by NFPA 820 to provide the lowest possible electrical hazard possible.

Areas classified under NFPA 820 (Digester Gas Handling Equipment and Sludge Pumping Room) will be ventilated at 6 or 12 air changes per hour based on the applicable requirements for the specific area. Additional ventilation will be provided, if required, to maintain a maximum temperature rise of 10°F above ambient conditions within the space caused by heat generating equipment. Heating systems will be provided to maintain a minimum temperature of 50°F±5°F, unless otherwise required by the specific process. No humidity control is to be provided.

Non-hazardous process areas not covered under the scope of NFPA 820 (Heat Recovery Steam Generator, RO, Digester Boiler Rooms) will be ventilated with outside air at a minimum rate of 6 air changes per hour (intermittent) utilizing exhaust fans. Additional ventilation will be provided, if required, to maintain a maximum temperature rise of 10°F above ambient conditions within the space caused by heat generating equipment. Heating systems will be provided to maintain a minimum temperature of 50°F±5°F, unless otherwise required by the specific process. No humidity control is to be provided.

8.3.2 Electrical Equipment Rooms

Electrical rooms will be cooled to maintain operation of electrical equipment and reduce the heat and humidity effects on the electrical equipment. The cooling design condition shall be a maximum temperature of 80°F. For electrical rooms containing equipment essential to plant operation, such as variable frequency drive (VFD) rooms, redundant air conditioning systems will be provided. Heating systems will be provided to maintain a minimum temperature of 50°F. Temperature/trouble alarms shall be provided to alert plant operators if temperatures rise or fall outside of required operating ranges.

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Section 9
Plumbing

Plumbing will be used on the design of the WRF for the new building structures. All new buildings, e.g., any buildings associated with the biosolids expansion will be designed to incorporate the regulations governing new construction.

9.1 Plumbing Codes & Design Standards

The applicable codes for the plumbing, fire protection, and fuel systems portions of the expansion will include the following:

- 2012 International Building Code with amendments
- 2012 International Existing Building Code with Amendments
- 2012 International Plumbing Code with Amendments
- 2012 International Fire Code with Amendments
- 2012 International Fuel Gas Code with Amendments
- 2009 International Energy Conservation Code with Amendments
- 2012 National Fire Protection Association (NFPA) Life Safety Code 101
- 2009 ICC A 117.1 Accessible and Useable Buildings and Facilities
- Applicable State of Tennessee Regulations
- Occupational Safety and Health Administration (OSHA)
- NFPA 820 Standard for Fire Protection in Wastewater Treatment and Collection Facilities
- NFPA 13 Standard for the Installation of Sprinkler Systems
- NFPA 30 Flammable and Combustible Liquids Code
- NFPA 37 Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
- All other applicable National Fire Protection Association (NFPA) Standards
- Recommended Standard for Wastewater Facilities (10 States Standards)
- The International Building Codes, NFPA 820 and other applicable NFPA standards, and the International Energy Conservation Code are the applicable codes of the local jurisdiction. The 10-State standard is a widely accepted industry design standard.

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9.2 Solids Processing Building

Plumbing systems will be provided for the Solids Processing Building.

The plumbing design will include the following items if required by final design: sanitary drainage, waste and vent (DWV) systems; acid resistant DWV systems with acid neutralization tank; primary and secondary storm water systems; potable domestic cold and hot water systems serving the facility's plumbing fixtures; non-potable protected water systems for wash down; tepid water systems for emergency fixtures; laboratory fixtures and equipment; and process water systems.

9.3 Digester Building

Plumbing systems will be provided for the Digester Building.

The plumbing design will include the following items if required by final design: sanitary DWV systems; primary and secondary storm water systems; potable domestic cold and hot water systems serving the facility's plumbing fixtures; non-potable protected water systems for wash down; tepid water systems for emergency fixtures; and process water systems.

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Section 10
Electrical Power Distribution

10.1 Electrical System Design Criteria

The applicable design codes for (latest edition in effect) for the electrical portions of this project will include the following.

- National Electrical Code (NEC)
- National Electrical Safety Code (NESC)
- American National Standards Institute (ANSI) C37.010
- American National Standards Institute (ANSI) C37.13
- American National Standards Institute (ANSI) C57.109
- International Electrical Testing Association (NETA) Standard ATS "Acceptance Testing for Electrical Power Distribution Equipment and Systems"
- Occupational Safety and Health Administration (OSHA)
- National Fire Protection Association (NFPA)
- National Electrical Manufacturers Association (NEMA)
- American National Standards Institute (ANSI)
- Insulated Cable Engineers Association (ICEA)
- Instrument Society of America (ISA)
- Underwriters Laboratories (UL)
- Factory Mutual (FM)
- International Electrical Testing Association (NETA)
- Institute of Electrical and Electronic Engineers (IEEE)

The design will conform to the latest version of all applicable codes in effect at the time of permit review.

10.2 Design Recommendations

10.2.1 Electrical Distribution System Loading Considerations

The solids system loading has been accounted for in the overall plant distribution system calculations. The solids electrical system will be designed with the necessary current capacity as well as the overall system build out capacity.

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10.2.2 Proposed Electrical Distribution

The solids area will be served from two 3000/3360 kVA pad mounted transformers located outside of the Solids Processing Building. The pad mounted transformers will serve 4000A dual ended secondary selective switchgear LV-SWGR-2. The new dual-ended secondary selective 480-volt switchgear will be located within a new climate controlled electrical room located on the first floor of the Solids Processing Building.

Switchgear LV-SWGR-2 will serve 480V, motor control centers (MCCs) located within the Solids Process Building and the Digester Building. These MCCs will serve the solids equipment and also provide step down transformers for the 120/208V loading.

10.2.3 NFPA 820 Design Requirements

All new work performed in areas governed by NFPA 820 must conform to the Standard. In general, if new work is required in a classified area, then the new work must meet the NEC for that hazardous location as defined by NFPA 820.

NFPA 820 applications are for new installations and do not apply to existing facilities unless a serious hazard exists. Typically, electrical rooms adequately separated from any processes are outside the classified areas and considered non-hazardous.

The Franklin WRF's new solids treatment facilities include major process areas which are governed by the NFPA 820 Standard and are summarized in **Table 10-1** below. The classifications noted in this table are for informational purposes only to provide a general overview of the plant hazardous areas as defined by NFPA 820. During the design phase, the area classifications will be further evaluated based upon specific processes and design decisions.

Table 10-1 NFPA 820 General Overview

Location	Classification	Notes
Sludge Holding Tanks (WAS)	Class I, Division I	If tanks open to the atmosphere, Class I, Division II per NFPA 820
Biosolids Storage Tanks	Class I, Division I	If tanks open to the atmosphere, Class I, Division II per NFPA 820
Dewatering Building	Class I, Division II	Building can be de-rated to unclassified if building ventilation design maintains a minimum of 6 air changes per hour.
Anaerobic Digesters	Class I, Division I	
Digester Gas Storage	Class I, Division I	

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Section 11
Instrumentation & Control

11.1 Proposed Modifications

In conjunction with the proposed process modifications, new process instrumentation and controls will be provided at the Franklin WRF. Existing instruments in affected areas will be inspected, and based on their condition and in coordination with Operations staff, either replaced in kind, or repaired and recalibrated.

New instruments, controls and equipment will be incorporated into existing PLCs (programmable logic controllers) where I/O (inputs/outputs) spares are adequate; or into new Remote I/O drops to be installed where I/O spares are not adequate to accommodate the new equipment; or into PLC-based control panels provided by equipment vendors. Controls will thereby be integrated into the plant's supervisory control and data acquisition (SCADA) system.

New and existing process instruments are shown in detail on the Process & Instrumentation Diagrams (P&IDs) in Section 11.3.

Process controls are described in detail in Section 4.

11.2 Design Concepts and Assumptions

It is assumed that instruments and controls that serve processes beyond the scope of the proposed modifications will not be inspected or replaced. Exceptions will be considered on a case-by-case basis, with priority given to items that have a direct impact on the proper function of the processes that are to be modified.

It is assumed that existing field instruments in affected process areas that lack adequate protection from electrical surges on the field side, through either power or signal wiring, will be retrofitted with such protection.

It is assumed that all new instruments will provide information to the SCADA system using traditional discrete (dry contact or relay) or analog signal outputs. Fieldbus technology is an option, but is not recommended in this project due to several factors. There is a substantial installed base of older instruments not easily adaptable to fieldbus interface. Creating a network of only a small number of fieldbus-capable instruments, with a potentially long distance between them, shrinks the potential cost savings to be realized in wiring and conduit. To realize the primary benefit of fieldbus technology – the availability of more data – the City would need to define goals for use of that data, and develop a plan to meet those goals in the SCADA system. However, the use of digital communications between electrical equipment (motor control centers, switchgear, and drives) and the PLCs adjacent to them is worthy of consideration. In such case, the cabling difficulties are minimized, and the added value of detailed power monitoring is significant.

The Franklin WRF is being outfitted with new Allen-Bradley CompactLogix Series L35E PLCs in all process area control panels, allowing for Ethernet connection to the plant SCADA system. Where a new Remote I/O control panel is required, or where process equipment requires vendor-furnished

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controls that are complex enough to merit the use of a dedicated PLC-based control panel, it is recommended that such controls include CompactLogix Series L35E PLCs and/or CompactLogix I/O modules, for maximum compatibility and connectivity with the SCADA system; or if CompactLogix is not appropriate for a specific application, any Allen-Bradley PLC and I/O with Ethernet/IP capability. Such panels will need to include Ethernet switches so that they can be added to the SCADA network. Panels located outdoors will require additional equipment to accommodate fiber optic cable (12-strand, 50/125μm, multi-mode), including Ethernet switches with fiber optic capability, and patch panels.

All plant processes, whether existing, new or modified, will be monitored and controlled by the plant SCADA system. The control philosophy of the system is to create three distinct control layers – human-machine interface (HMI), PLC, and local/hardwired controls – in which each layer is supervised by, but does not depend on, the layer above it. For example, the HMI supervises the entire PLC network, but if the HMI fails, then PLC controls will still function automatically. In general, the system will be designed for total automation, with manual override available at all three control layers. However, the appropriate degree of monitoring and control provided at the HMI over each process subsystem will vary.

11.3 Process and Instrumentation Diagrams (P&IDs)

List of Figures:

11-1 Process Flow Diagram

11-2 Process Flow Diagram

11-3 Process Flow Diagram

11-4 Process Flow Diagram

11-5 Process Flow Diagram

11-6 Sludge Screening

11-7 WAS Storage and Centrifuge Feed Pumps

11-8 Pre-Dewatering Centrifuges

11-9 Pre-Dewatering Polymer Storage Tanks and Blending

11-10 Pre-Dewatering Aging Tanks and Feed Pumps

11-11 Pre-Dewatering Cake Bin and THP Feed Pumping

11-12 CHP System Reciprocating Engine

11-13 CHP System Deaerator and Feedwater

11-14 CHP System Blowdown

11-15 CHP System Steam Distribution

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11-16 CHP System Auxiliary Boiler No. 1

11-17 CHP System Auxiliary Boiler No. 2

11-18 CHP System Water Treatment

11-19 FOG Receiving System

11-20 Digester Heat Exchanger 1 of 2

11-21 Digester Overflow Mixing and Withdrawal

11-22 Digester Withdrawal Pump

11-23 Digester Gas System 1 of 2

11-24 Digester Gas System 2 of 2

11-25 Post-Dewatering Screw Press

11-26 Post-Dewatering Polymer Storage Tanks and Blending

11-27 Post-Dewatering Aging Tanks and Feed Pumps

11-28 Solar Dryer

11-29 Biosolids Odor Control 1 of 2

11-30 Biosolids Odor Control 2 of 2

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Section 12

Permit Requirements & Maintenance of Plant Operations

12.1 Permit Requirements

Permit requirements are discussed in the January 2013 PDR.

12.2 Maintenance of Plant Operations

Because this project involves a near-total replacement of the Franklin WRF's solids treatment facilities, it is expected that the new facilities will be constructed independent of current plant operations, and therefore, there will be fewer potential MOPO issues compared to the rest of the plant upgrades. CDM Smith anticipates that the following tie-ins to existing process piping, utilities and drainage systems will be needed.

- Connection of switchgear LV-SWGR-2 in the Solids Processing Building electrical room to the plant's main electrical service.
- Connection of new WAS force main piping from the existing WAS pump stations to the sludge screen feed piping at the Solids Processing Building.
- Extension of potable and plant reuse water service throughout the solids facilities.
- Connection of process drainage from the solids treatment facilities to an existing manhole south of the existing solids handling odor control system.

Additional tie-ins and MOPO issues will be identified as design progresses.

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Section 13

Opinion of Probable Construction Cost

This section will be provided following development of the 30 percent Opinion of Probable Construction Cost (OPCC).

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ATTACHMENT 1

CDM Smith

cdmsmith.com

Appendix A

Memorandum: Evaluation of CHP Strategies

ATTACHMENT 1

CDM Smith

Memorandum

To: *Project File*

From: *Glynn MacKenzie, P.E.*
Scott Henriques, P.E., LEED AP O&M

Date: *June 27, 2014*

Subject: *City of Franklin, Tennessee*
Franklin WRF Modifications & Expansion Project
Evaluation of CHP Strategies

As part of the Franklin WRF Modifications & Expansion Project, CDM Smith is designing a new solids treatment process that includes a thermal hydrolysis process (THP), which uses steam to hydrolyze solids before they are fed to the anaerobic digesters. The hydrolysis process enables the digesters to further reduce the quantity of solids to be disposed while increasing production of useful biogas.

Because differing strategies for generating the steam required by THP have emerged, CDM Smith has analyzed the economics of the following four CHP scenarios, which differ in their THP technology and engine loading. The scenarios are also displayed in Table 2.

Scenario 1: The CHP system is sized and loaded to produce the entire steam demand of the Cambi system.

Scenario 2: The CHP system is sized and loaded to produce the entire steam demand of the Kruger Exelys system.

Scenario 3: The CHP system is sized and loaded to consume the biogas produced from the anaerobic digesters.

Scenario 4: The CHP system is sized and loaded to consume the biogas produced from the anaerobic digesters.

Each scenario utilizes a Jenbacher JMS 312 reciprocating engine with Heat Recovery Steam Generator (HRSG) and a THP system by either Cambi or Kruger, the two THP system suppliers under consideration. The JMS 312 energy balance data is depicted in Table 1.

CHP Loading	100%	75%	50%
Gas In (scfm/MBH)	164/5,886	127/4,572	91/3,259
Electricity Output (kW)	633	473	312
Steam Output (lb/hr)	1,156	867	578

Table 1. JMS 312 CHP Energy Balance Data

Scenarios 1 and 2 adjust the engine loading to meet the steam demand of the THP system, called "steam load following," while scenarios 3 and 4 adjust the engine loading to consume 100 percent of the biogas produced in the digesters, called "biogas load following." Firetube boilers, equipped with natural gas and biogas burners, are included to backup (scenarios 1 and 2) or supplement the CHP steam production (scenarios 3 and 4).

CHP Scenario	Design Basis	Equipment Selection	
	Load Following, THP Process	CHP Engine(s)	Boiler(s)
1	Steam, Cambi	2 x JMS 312 Fuel: Natural Gas/Biogas	2 x 1,250 lb/hr Steam Production: 190 psig, saturated
2	Steam, Kruger	2 x JMS 312 Fuel: Natural Gas/Biogas	2 x 1,250 lb/hr Steam Production: 220 psig, saturated
3	Gas, Cambi	1 x JMS 312 Fuel: Biogas	3 x 1,250 lb/hr Steam Production: 190 psig, saturated
4	Gas, Kruger	1 x JMS 312 Fuel: Biogas	3 x 1,250 lb/hr Steam Production: 220 psig, saturated

Table 2. CHP Scenarios Analyzed

For this analysis, two engines, each nominally rated at 633 kW, were used in Scenarios 1 and 2, where the engine load was set to produce the THP steam demand. Without enough biogas to run the engines at these levels, the engine was assumed to be fueled by a blend of natural gas and biogas. Two firetube boilers, each rated at 50 percent of the THP maximum steam demand, acted as a backup, allowing normal THP system operation during CHP maintenance or failure.

In Scenarios 3 and 4, where the engine load was set to consume the biogas produced in the digesters, only one engine was required. However, the firetube boilers were used to supplement the CHP steam production during normal operation, and three units producing 1,250 lb/hr were recommended to ensure plant capacity and reliability. Despite normal engine operation only burning biogas, it is recommended to keep the flexibility of burning natural gas from the grid in the event that biogas becomes unavailable.

The scope of this study included treatment plant flows that increased from 14.6 million gallons per day (mgd) in 2018 to 30.6 mgd in 2040. Capital costs for the boilers and engines were based on a Cleaver Brooks budget quote and the U.S. Environmental Protection Agency's (US EPA) CHP Project Development Handbook. Costs for boilers and engines were estimated at $150,000 per boiler and $1,650 per kW of electric capacity, respectively. Because the engine and HRSG are expected to be installed in outdoor enclosures, the costs of the CHP Plant space were for outdoor pads projected at $600 per cubic yard. Based on vendor provided footprints of 40 ft x 8 ft and 30 ft x 10 ft for the engine and HRSG, respectively, these expected costs are $100,000. Space costs associated with the water treatment, deaerator, and two auxiliary boilers are incorporated in the digester building.

Costs of purchasing natural gas, CHP operation and maintenance, and CHP electricity cost savings were estimated and compared with the CHP's initial capital costs to determine annual savings and payback. The results are shown in Table 3 and will be discussed in detail in this memorandum.

CHP Governor	Steam		Biogas	
THP Process	Cambi	Kruger	Cambi	Kruger
Scenario	1	2	3	4
Estimated CHP Capital Costs ($)	$2,489,000	$2,713,000	$1,639,000	
Payback Year	2025	2025	2024	2025
Lifecycle Profit ($)	$12,056,000	$13,566,000	$10,718,000	$8,322,000

Table 3. Results of CHP Economic Analysis

Background & Design Assumptions

The CHP evaluated in this study was designed to supplement CDM Smith's design of the expansion of the Franklin WRF. Beginning with 14.6 mgd in 2018, incoming wastewater flows have been projected by others to increase 726,000 gallons per day per year, reaching 30.6 mgd in 2040.

From incoming wastewater flow projections, CDM Smith's process mass balance calculations estimated daily flows of solids, both dry and volatile, produced by the liquid treatment process. Utilizing ratios of 1,416 lb of dry solids per million gallons wastewater and 15 cubic feet of biogas produced per pound volatile solids destroyed, the average biogas production in the anaerobic digesters was calculated. For peak (maximum month) production estimates, dry solids production was increased by a peaking factor of 1.3.

THP systems supplied by Cambi and Kruger are being considered for the Franklin WRF. Due to the differences in the THP suppliers' steam requirements evaluated in this study, they were analyzed separately. The Cambi THP process was not only at a lower pressure than Kruger (190 psig vs. 220 psig), but also required less mass flow to hydrolyze the sludge. While the Cambi system demanded 1 pound of steam per pound of dry solids, the Kruger system needed 1.42 pounds.

When supplemental boilers were required, a conservative assumption of no feed water preheating was made. As a result, the boiler required 1,170 BTU_{gas}/lb_{steam} at 80 percent efficiency.

Engine data for the Jenbacher JMS 312 was used as the basis of the analysis, and both costs and performance are scaled proportionally based on the sizes required for each scenario. Values for gas energy input, electricity generated, and steam output were included at full, 75 percent, and 50 percent load. 25 percent load estimates were found by extrapolation. Engine loads presented in this analysis are relative to a single engine, meaning that a 1.5 (150 percent) load fraction would consist of two engines, one at full load and the other at half load (or two at 75 percent).

Assuming constant electric and thermal load profiles, the annual engine setting was set by the varying CHP scenarios, with all of the energy produced by the CHP consumed on site.

Analysis and Results

The CHP scenarios evaluated generally led in two divergent paths. While the CHPs in scenarios 3 and 4 simply utilized the available biogas, Scenarios 1 and 2 expanded their capacity to produce more of the plant's required electric and steam energy. Having been assured that the CHP electrical capacity or steam production would not exceed the plant's electric demand (currently above 1 MW and only growing as the facility expands until 2040) or THP requirements, CDM Smith assumed that all energy produced would be consumed on site.

The economic analysis compared the added costs of this increased capacity to the savings of producing energy on site rather than purchasing from the grid on an average basis. As one would expect, the analysis then greatly depended on the purchasing cost of energy. In 2011, natural gas

and electricity costs were $7.83/MMBTU and $0.095/kWh, respectively, and were expected to escalate at a rate of 3 percent annually. Costs for operation and maintenance (O&M) of the CHP were estimated at $0.016 per kWh_e, based on US EPA's CHP Project Development Handbook. Table 4 shows the results in 2018, the first year of the study. In addition to the complete analysis, the summary tab in Attachment 1 provides a similar breakdown for three representative years (2018, 2030, and 2040).

CHP Scenario	1- Steam, Cambi	2- Steam, Kruger	3- Biogas, Cambi	4- Biogas, Kruger
Biogas Generated (MBH)	2,915	2,915	2,915	2,915
CHP Natural Gas Purchased (MBH)	1,545	3,894	0	0
Aux Boiler Natural Gas Purchased	0	0	509	1,050
CHP Steam Generated (lb/hr)	861	1,220	514	502
Aux Boiler Steam Generated (lb/hr)	0	0	348	718
Electricity Generated (kW)	459	660	270	270
Annual Natural Gas Costs ($)	($130,000)	($328,000)	($43,000)	($89,000)
Annual CHP O&M Costs ($)	($64,000)	($92,000)	($38,000)	($38,000)
Annual Electricity Savings ($)	$455,000	$653,000	$267,000	$267,000
Total Annual Savings ($)	**$260,000**	**$232,000**	**$186,000**	**$140,000**

Table 4. 2018 CHP Scenarios Analysis Results

Scenario 1

For Scenario 1, the CHP was loaded to produce the steam required by the Cambi THP. In 2018, the first year of the study, the required steam output occurred at 73 percent load. However, this loading demanded 4,460,500 BTU/hr (4,460.5 MBH) of gas, of which only 2,915 MBH came in the form of biogas from the anaerobic digesters. The additional 1,545.5 MBH was purchased from the grid as natural gas and blended with the biogas before being sent to the reciprocating engine, at an annual cost of $130,000. O&M of the engine added $64,000. Accounting for the annual electricity savings of $455,000, the CHP provides $260,000 in value for 2018.

This annual savings only increased as the treatment plant's capacity increased. By 2026 (year 9 of the analysis), the load exceeded the capability of a single engine, and the second engine was required to run in tandem. By 2040, the plant incoming average daily flow was expected to grow by more than double that of 2018. Subsequently, the THP demanded more steam flow, and more biogas was created from the digesters. A higher THP steam requirement increased the engine load to 153 percent, meaning that one engine would be at full load while the other was at 53 percent. The added capacity increased the annual natural gas and O&M costs to $514,000 and $135,000, but saved $1,832,000 in electricity, providing an annual savings of $1,183,000.

ATTACHMENT 1

	CHP Governor	Steam		Gas	
	THP Process	Cambi	Kruger	Cambi	Kruger
	Estimated CHP Capital Costs ($) [1]	($2,488,900)	($2,712,608)	($1,639,349)	($1,639,349)
	Payback Year	2025	2025	2024	2025
	Lifecycle Profit	$12,055,631	$13,566,190	$10,717,754	$8,321,540
2018	Biogas Gas Generated (MBH)	2,915	2,915	2,915	2,915
	CHP Natural Gas Purchased (MBH)	1,545	3,894	0	0
	Aux Boiler Natural Gas Purchased (MBH)	0	0	509	1,050
	CHP Steam Generated (lb/hr)	861	1,220	514	502
	Aux Boiler Steam Generated (lb/hr)	0	0	348	718
	Electricity Generated (kW)	459	660	270	270
	Annual Natural Gas Costs ($)	($130,376)	($328,458)	($42,920)	($88,550)
	Annual CHP O&M Costs ($) [2]	($64,379)	($92,454)	($37,776)	($37,776)
	Annual Electricity Savings ($)	$454,676	$652,954	$266,794	$266,794
	Total Savings ($)	$259,921	$232,042	$186,098	$140,468
2030	Biogas Gas Generated (MBH)	4,652	4,652	4,652	4,652
	CHP Natural Gas Purchased (MBH)	2,722	5,460	0	0
	Aux Boiler Natural Gas Purchased (MBH)	0	0	688	1,554
	CHP Steam Generated (lb/hr)	1,375	1,947	904	885
	Aux Boiler Steam Generated (lb/hr)	0	0	470	1,062
	Electricity Generated (kW)	729	1,064	483	483
	Annual Natural Gas Costs ($)	($327,419)	($656,714)	($82,712)	($186,866)
	Annual CHP O&M Costs ($) [2]	($102,175)	($149,113)	($67,661)	($67,661)
	Annual Electricity Savings ($)	$1,034,525	$1,509,769	$685,065	$685,065
	Total Savings ($)	$604,931	$703,942	$534,693	$430,539
2040	Biogas Gas Generated (MBH)	6,109	6,109	6,109	6,109
	CHP Natural Gas Purchased (MBH) [3]	3,179	6,776	0	0
	Aux Boiler Natural Gas Purchased (MBH) *	0	0	838	1,977
	CHP Steam Generated (lb/hr)	1,805	2,557	1,232	1,205
	Aux Boiler Steam Generated (lb/hr)	0	0	573	1,352
	Electricity Generated (kW)	964	1,402	660	660
	Annual Natural Gas Costs ($)	($513,789)	($1,095,271)	($135,491)	($319,550)
	Annual CHP O&M Costs ($) [2]	($135,050)	($196,446)	($92,535)	($92,535)
	Annual Electricity Savings ($)	$1,831,618	$2,664,293	$1,255,009	$1,255,009
	Total Savings ($)	$1,182,779	$1,372,576	$1,026,983	$842,924

[1] Based on $1,650/kWe, $150k per Aux Boiler, $100k CHP space

[2] Based on $0.016/kWhe

[3] Surplus Gas is used to reduce Aux Boiler NG purchased

* A negative value indicates Waste Gas Flare/Venting

ATTACHMENT 1

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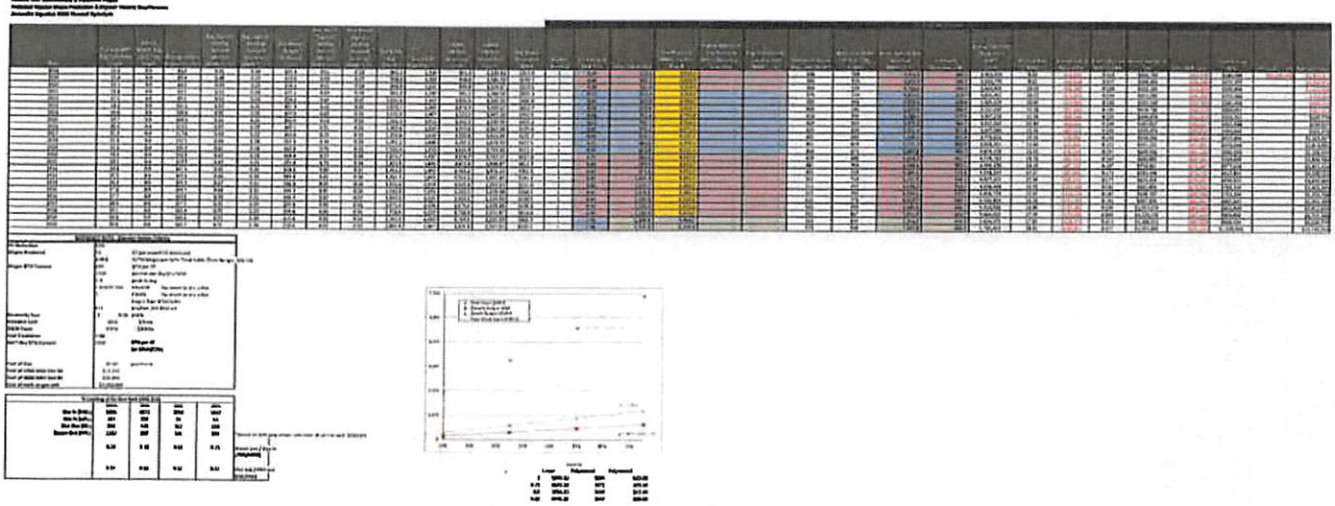

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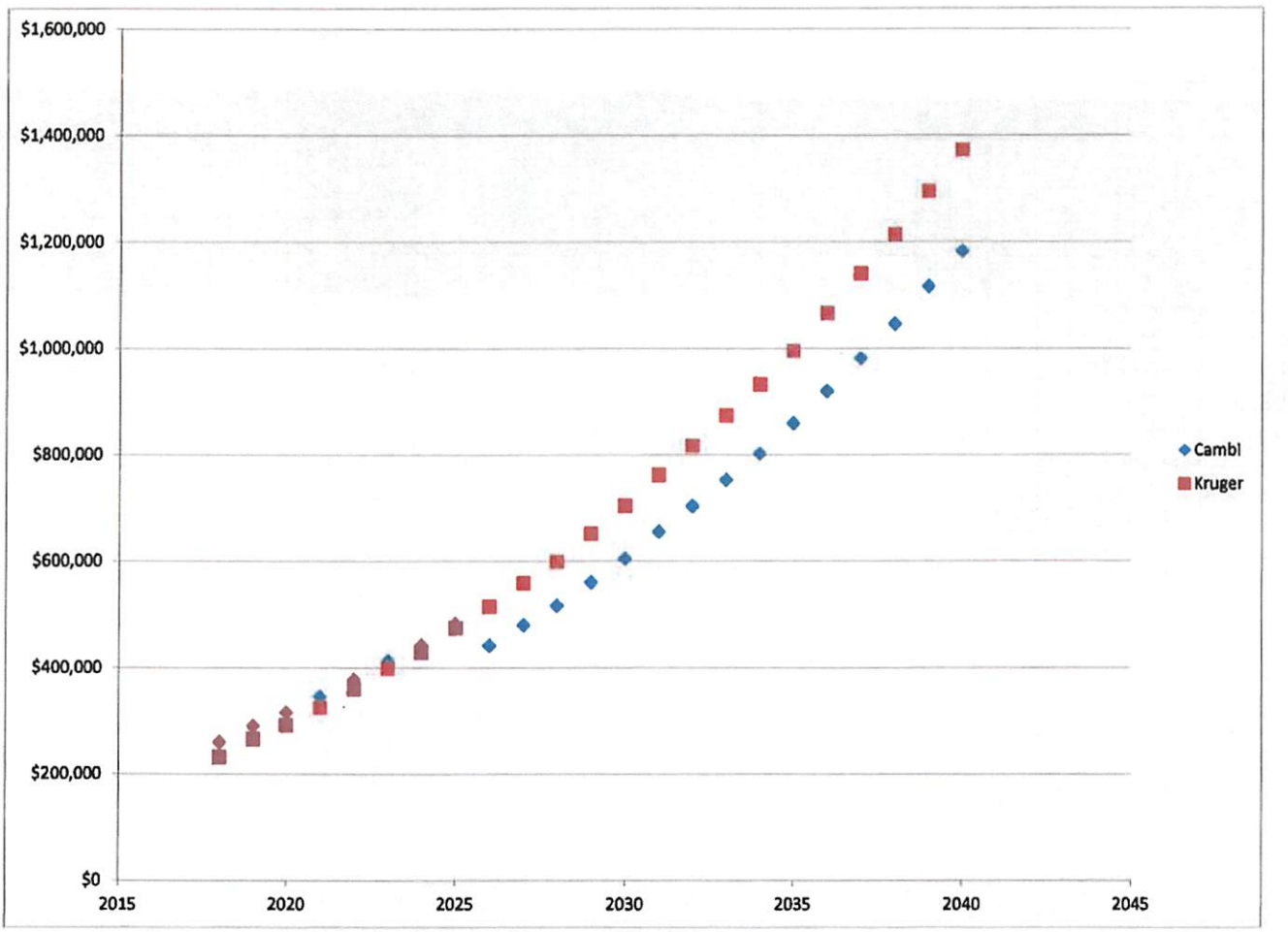

ATTACHMENT 1

Appendix B

Memorandum: Evaluation of Sludge Screening

ATTACHMENT 1

CDM Smith

Memorandum

To: *Bob Huguenard*

From: *K. Richard Tsang*

Date: *June 13, 2014*

Subject: *City of Franklin, Tennessee*
Franklin WRF Modifications & Expansion Project
Evaluation of Sludge Screening

The City of Franklin (the City) is in the process of upgrading its wastewater treatment plant. As part of this upgrade, an entirely new solids processing train will be put in. After a thorough evaluation of biosolids management options, the City has elected to install a thermal hydrolysis process (THP) along with anaerobic digestion to produce Class A biosolids. Solar dryers may be included in the treatment process if market demands dictate the need for a drier product.

In developing the biosolids treatment process train, CDM Smith has considered the need for sludge screening at the head of the treatment process. The general trend in the industry is to add screening to the sludge stream, particularly when the Class A biosolids product will be beneficially used. Although Krüger, one THP system supplier, has informed CDM Smith that screening is not critical for its process, another supplier, Cambi, has indicated that it will be critical to have screening as part of their system.

CDM Smith has found that, in general, O&M costs and effort related to the solids processes can be reduced by screening the sludge. Therefore, we recommend the addition of sludge screening. The reasons to include sludge screening include the following:

1. **Reduce wear on THP system components.** The THP system consists of pressure vessels, pumps, steam injection nozzles, pressure relief valves, transfer valves, instruments, etc., that are subject to wear. The presence of materials such as grit, rags, and other mineral matter will increase wear of these components, which subsequently will affect the frequency of maintenance requirements and the availability of the system for treatment.

2. **Reduce the risk of pressure vessel failure.** Operation of the THP system (particularly the THP system supplied by Cambi) relies on a large number of pumps, pipes and valves to move sludge in and out of vessels. Because of its tendency to plug pumps, pipes, and valves, debris in the sludge will increase the risk of tank and other mechanical component failures. As the cooling system downstream of THP also requires sludge to run through heat

exchangers, screening the sludge will also reduce the risk of plugging and fouling these heat exchangers.

3. **Reduce the frequency of digester maintenance.** Debris that is present in sludge tends to accumulate in the digesters. Over time, the debris will take up space, and it will wear on mechanical equipment such as mixers and pumps. Screening the sludge will reduce the need to clean the digesters. The finished Class A product will also be free of debris such as hair, rags, and plastics, which would reduce its marketability.

The Phase I conceptual level opinion of probable construction cost (OPCC) for the addition of sludge screening is $3,600,000. **Table 1** presents the OPCC. The following assumptions were made in the development of this OPCC.

- Two Huber Technology Strainpress SP4 screens (one duty and one standby) are needed to screen the quantity of sludge that will be processed in Phase 1. Space for the addition of a future third screen, which will be needed to treat future sludge flows, is included. 6mm flow through type, totally enclosed screens are recommended for this application (6mm filtering opening, 6mm compression opening).

- Two screenings dumpsters, similar to those currently used by the City, are included for collection and disposal of the screened material. Space for a future third dumpster will be provided below the future third sludge screen. City trucks will access the dumpsters via a roll-up door in front of each dumpster.

- Addition of the sludge screening facility to the Pre-Dewatering Building will require an additional 2,000 square feet of space. It was assumed that the sludge screening facility will occupy two floors, with the sludge screens located on the upper floor and the screenings dumpsters on the ground floor.

- Odor control will be provided around the screenings dumpsters on the first floor.

- Dedicated lifting equipment will not be provided for the sludge screens. Instead, plant maintenance staff will move the screening equipment into the adjacent pre-dewatering centrifuge room and use that room's bridge crane to transfer the screens to a truck parked in the pre-dewatering truck bay.

- An allowance for upgrades to the existing WAS pumps is included. Larger pumps are required in order to accommodate the added head loss produced by the sludge screens.

Table 1 Opinion of Probable Construction Cost – Sludge Screening Facility

Construction Cost Component	% of Cost	Cost
Process Equipment & Piping		
Sludge Screens (1 duty + 1 standby, space for 1 future)	n/a	$320,000
Air Compressor System	n/a	Included
Screenings Dumpsters	n/a	$2,000
Allowance: Monorail & Hoist	n/a	$0
Allowance: Odor Control for Sludge Screenings Room	n/a	$100,000
Allowance: WAS Pumping Upgrades	n/a	$200,000
Structure		
Sludge Screen Building (Part of Pre-Dewatering Building)	n/a	$593,400
Demolition		
None	n/a	$0
Labor, Construction Equipment & Misc. Material	30.0%	$186,600
Site Preparation	5.0%	$60,770
Piping	15.0%	$210,300
Electrical/I&C	25.0%	$303,850
Total Direct Costs		**$1,976,920**
Permits	0.5%	$9,885
Sales Tax	9.5%	$59,090
Builder's Risk	0.5%	$18,000
General Liability	1.0%	$36,000
Bonds & Insurance	1.5%	$54,000
Subtotal Prior to OH&P		**$2,153,895**
General Conditions	10.0%	$215,389
Contractor's Overhead & Profit	10.0%	$215,389
Subtotal with OH&P		**$2,584,674**
Construction Contingency	30.0%	$775,402
Total Cost at Today's Dollars		**$3,360,076**
Escalation to Midpoint of Construction	6.8%	$227,507
TOTAL CONCEPTUAL CAPITAL COST		**$3,600,000**

cc: Carrie Carden

Attachments:

Cambi sludge feed specification
Huber Strainpress SP4 Brochure

ATTACHMENT 1

GENERAL THP FEED SPECIFICATION

Client
N/A

Document title
General THP Feed Specification

Project title
Cambi Standardisation Programme

Cambi document number

901003	P	SP	002	A03
Project no	*Discipline*	*Doc type*	*Sequence no.*	*Revision no.*

Client document number
N/A

Revision history

Rev	*Date*	*Issue*	*Made by*	*Checked by*	*Approved by*	*Client approval*
A01	16.08.2012	Issued for information	JK	OES	MN	N/A
A02	24.01.2013	Issued for information	MD	OES	PJN	N/A
A03	02.09.2013	Issued for information	BF	HRH	PJN	N/A

CAMBI

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THP FEED SPECIFICATION

1. GENERAL

The following specification describes our requirements to the feed streams to the THP.

The Cambi THP has two alternative designs, one for treatment of waste-water treatment sludge only, and one for treatment of biowaste. The feed-stock requirements for these models are described in separate sections below.

Specific local requirements (national/regional laws, regulations etc.) are not considered in the feed specifications. Fulfilment of these requirements must be evaluated for each region.

Treatment of waste-water treatment sludge is relevant for all models; B2, B6 and B12.
Treatment of biowaste is relevant for B12 and B6.

For all types of waste, it must not contain toxic substances in concentrations that inhibit the process in downstream bioreactors.

2. CAMBI THP FOR WASTE-WATER SLUDGE

Cambi Requirements:

Operation	Continuous
Accepted feed-streams	• Primary sludge • Secondary / Waste Activated sludge • Fat-Oil-Grease (from waste-water inlet separation/treatment) • Pre-treated septic
Feed-stream mixture	The different feed-streams shall be fed to the THP at a constant mixture relation (recipe). Relative variation on any fraction shall not be more than 20% on a daily basis.
Dry solids concentration to pulper;	Maximum 18.5%DS. Design should be maximum 16.5%DS to allow for unintended variations. Lower dry solids concentrations will increase specific steam consumption (t steam/t dry solids). Dry solids concentrations below ~2%DS will cause increased vibrations and wear on equipment.
Dry solids variation to pulper;	An hourly variation of +/- 2% point is acceptable
Feed stream temperature	Minimum 5°C Maximum 30°C
Chloride content:	<400 mg/l
Abrasive material limitation	Abrasive materials defined by ash particles >150 micron Max 100 kg/day >150 micron with a particle size distribution (by mass): Max 50% more than 200 micron max 5% more than 700 micron
Sludge quality:	The sludge shall be screened to remove rags. Any other industrial effluents coming into the plant shall also be pre-treated in order not to cause operational problems in the water treatment and the sludge treatment as per EU Waste-water Directive.

CAMBI

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	Feed-stream	Recommended treatment and requirement
Feed stream pre-treatment in addition to DS adjustment	Primary sludge	None, assuming 6 mm screens on inlet to WWTP
	Secondary / WAS	None
	FOG	None
	Imported sludge	Screened to max. 6 mm
	Pre-treated septic	Screened to max. . 6 mm as well as an efficient sand and grit removal system included.

Notes:

- If inlet screens are not in accordance with requirements above, we recommend treatment by e.g Huber strain-press with 3 mm filtering zone and 6 mm compression zone. The B2 model is more sensitive to particle size than the B6 and B12 models. For B2 it is therefore always a requirement to install a Huber strain-press (or equivalent) with 3 mm filtering zone and 6 mm compression zone.
- If sludge temperature to pulper is higher than 15°C, this will affect the downstream process, in particular increased heat transfer requirement on the downstream sludge cooling systems.
- For sand and grit removal for septic, a Huber septic pre-treatment unit or similar is recommended.

3. CAMBI THP FOR BIOWASTE

Cambi Requirements:

Operation	Continuous
Feeds	Biodegradable biowaste, e.g.: • Slaughter-house waste • Fish-farming waste • Source-separated household bio-waste • Supermarket food-waste • Food waste from vegetable and fruit handling • Food waste from dairy production facilities • Commercial kitchen food-waste • Corn ensilage • Sludge as defined in 1.2 in combination with the above.
Feed-stream mixture	The different feed-streams shall be fed to the THP at a constant mixture relation (recipe). Relative variation on any fraction shall not be more than 20% on a daily basis.
Dry solids concentration to pulper;	Maximum 18.5%DS. Design should be maximum 16.5%DS to allow for unintended variations. Lower dry solids concentrations will increase specific steam consumption (t steam/t dry solids). Dry solids concentrations below ~2%DS will cause increased vibrations and wear on equipment.
Dry solids variation to pulper;	An hourly variation of +/- 2% point is acceptable
Feed stream temperature	Minimum 5°C Sludge feed temperatures above 15°C requires a lower hydrolysis temperature than 165°C. This causes reduced effect of the THP.
Chloride content:	<400 mg/l

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Abrasive material limitation pr stream, Biowaste Light	Abrasive materials defined by ash particles >150 micron Max 100 kg/day >150 micron with a particle size distribution (by mass): Max 50% more than 200 micron max 5% more than 700 micron Typical sludge and codigestion with feedstock low on sand and grit
Abrasive material limitation pr stream, Biowaste Medium	Abrasive materials defined by ash particles >150 micron Max 300 kg/day >150 micron with a particle size distribution (by mass): Max 50% more than 200 micron max 5% more than 700 micron Typical sludge and codigestion with feedstock low on sand and grit
Abrasive material limitation pr stream, Biowaste Heavy	Abrasive materials defined by ash particles >150 micron Max 700 kg/day >150 micron with a particle size distribution (by mass): Max 50% more than 700 micron max 5% more than 4000 micron Typical housholdwaste and codigestion with feedstock high on sand and grit.
Feed-stream quality, general:	- In liquid form and pumpable. - Homogeneous and free from large amounts of contaminants. - Sorted/screened to remove rags, twigs, plastic, glass, metals and other contaminants. - Maximum particle size for organic material is Ø10 mm.

For the abrasive materials:

- Light implies the same THP model as for sludge (chapter 1.2).
- Medium implies the same THP model as for sludge (chapter 1.2), with centrifugal pumps on pulper and flashtank and Duplex pipes in selected pipes.
- Heavy implies the same THP model as for Medium, with Gritex sediment removal system on pulper and flashtank circulation.

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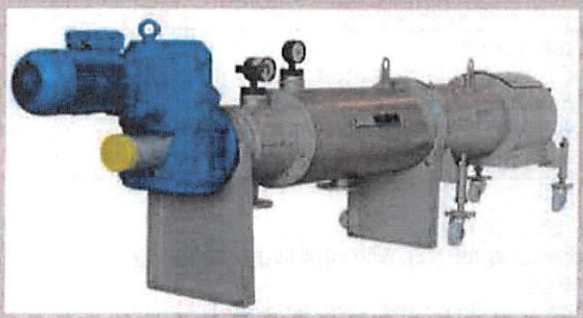
ATTACHMENT 1

HUBER TECHNOLOGY
WASTE WATER Solutions



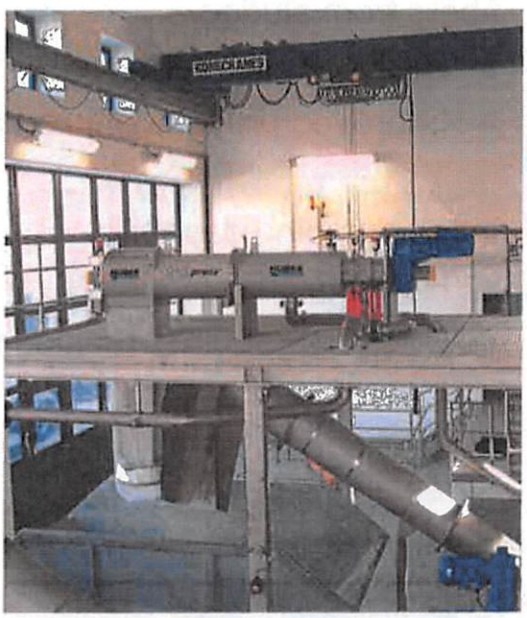
Strainpress

Pressure feed sludge screening

Presented by:

T.R. Gregg, Marketing Manager

Strainpress – key features



- Suitable for pressurised pipelines
- Flows up to 400 GPM, aperture 5 mm
- Operates without wash water
- Screenings discharge pressure regulated for optimum dry product
- Manufactured entirely from Stainless Steel

Strainpress – key benefits

Removal of screening, hair, and fibers from sludge

- Reduced maintenance
- Improved process efficiencies

Inline pumping capability

- Retrofits current piping
- Does not require breaking to atmosphere

Screening & dewatering in a single step

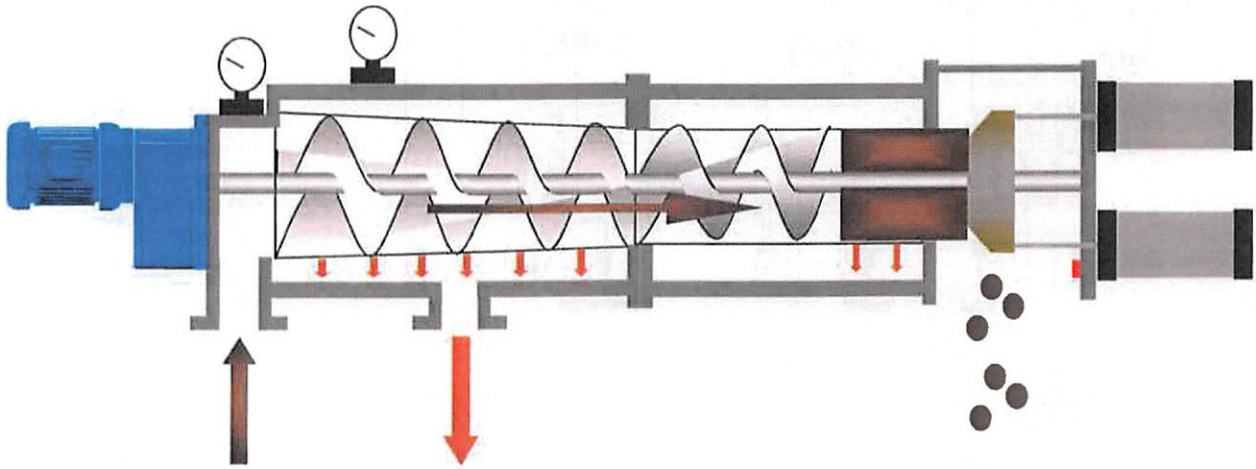
- Reduced hauling costs
- No process water required

Strainpress – principal of operation

HUBER TECHNOLOGY
WASTE WATER Solutions

Controlled by

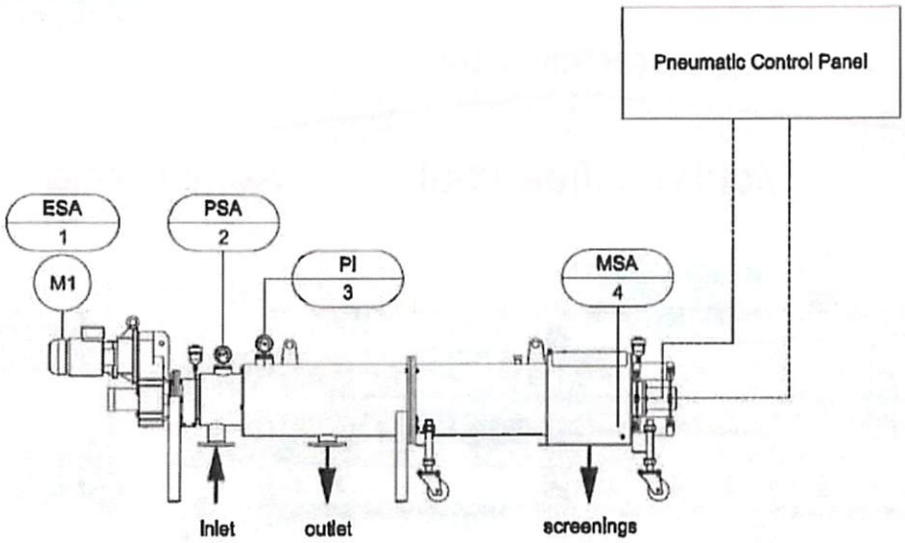
Screw speed | Monitor differential | Adjust cone



Sludge in | Sludge out | Screenings removed

Feed rate

Strainpress – P & ID



M 1	Motoreducer
ESA 1	PC-Powercontrol
PSA 2	Pressure gauge inlet with 2 pressure switches
PI 3	Pressure gauge outlet
MSA 4	sludge probe / moisture sensor

Strainpress – Where is it applied?

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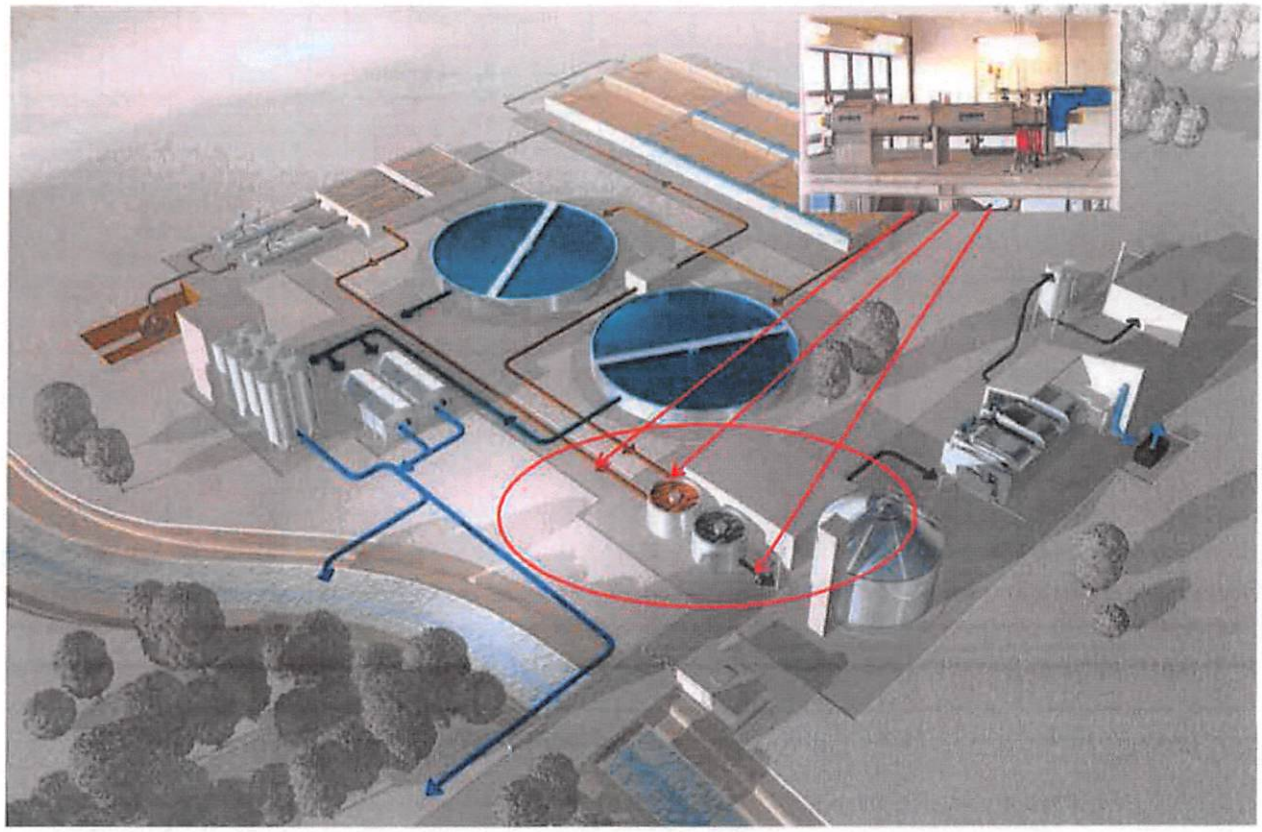
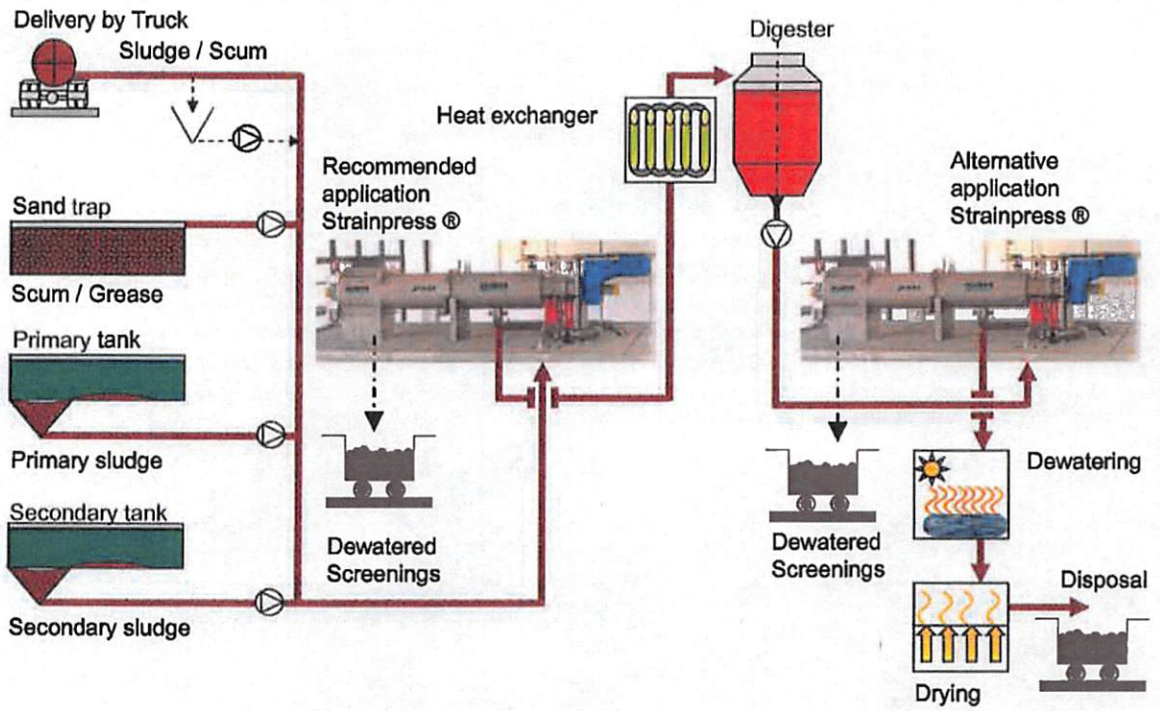
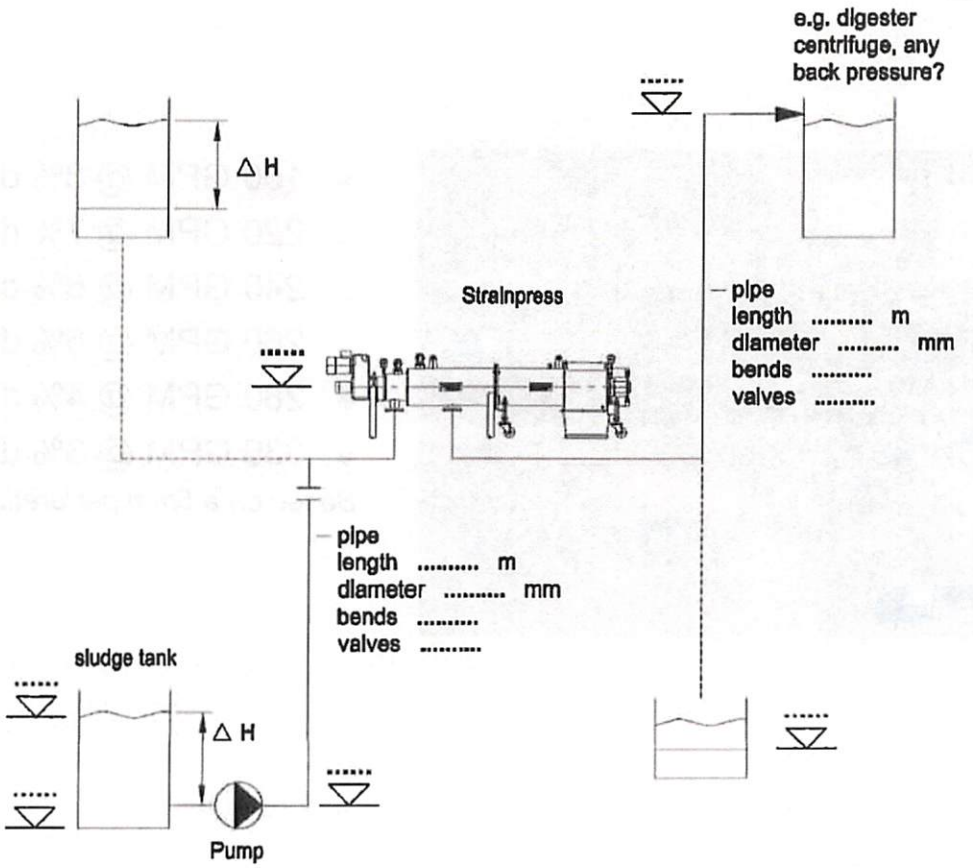
WASTE WATER Solutions



Strainpress – Where is it applied?



Strainpress – flexible in the flow plan



Strainpress – throughput

- 150 GPM @ 8% ds
- 220 GPM @ 7% ds
- 240 GPM @ 6% ds
- 260 GPM @ 5% ds
- 280 GPM @ 4% ds
- 330 GPM @ 3% ds

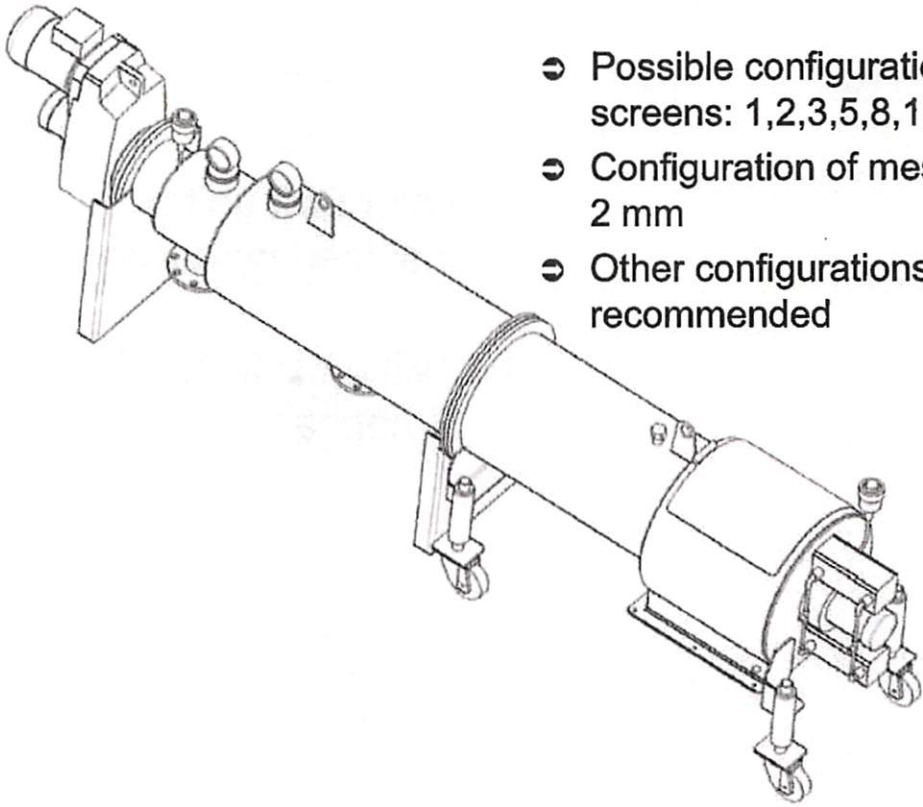
Based on a 5mm perforations

Strainpress – Where is it installed?

Over 900 units installed worldwide

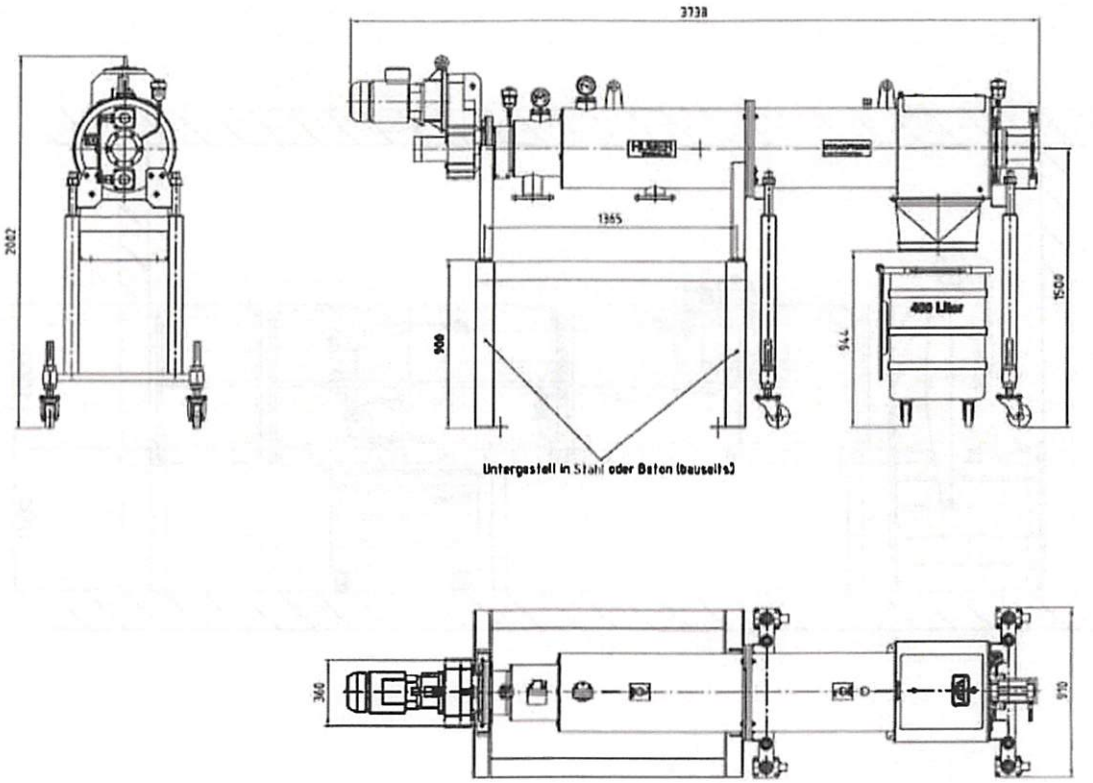
148 units in North America

Strainpress – Many configurations possible

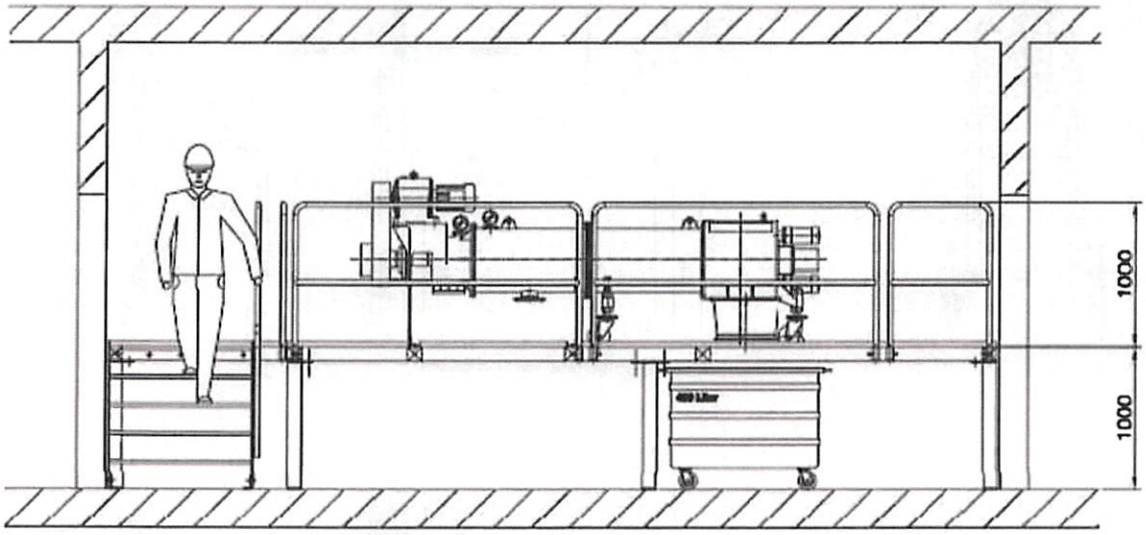


- Possible configurations of screens: 1,2,3,5,8,10 mm
- Configuration of mesh: 0.35 x 2 mm
- Other configurations: Pilot is recommended

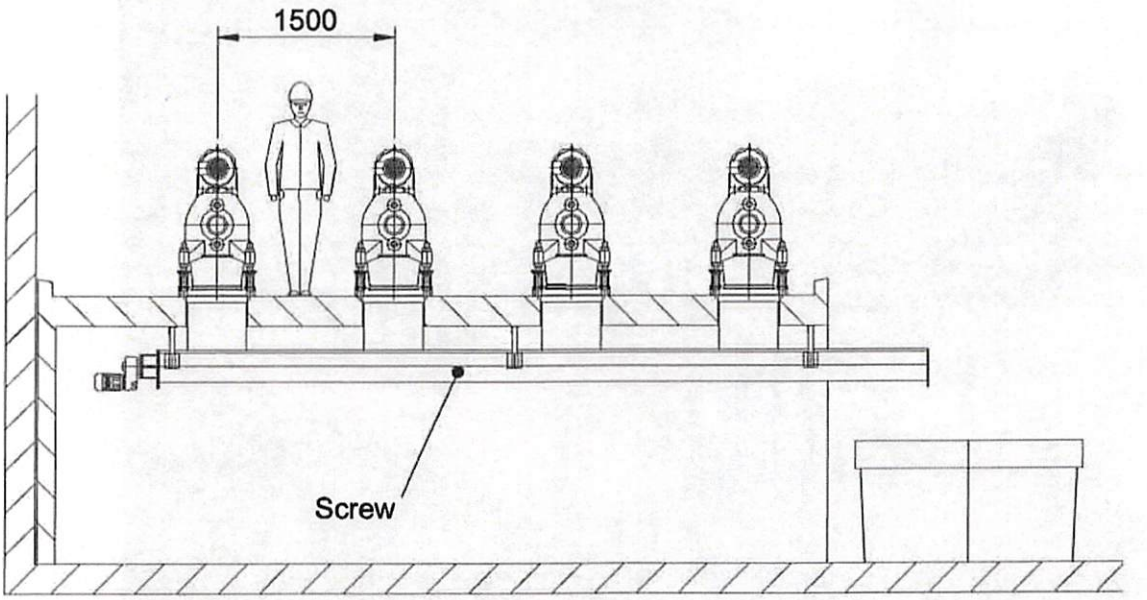
Strainpress – configuration possibilities



Strainpress – configuration possibilities



Strainpress – configuration possibilities



Strainpress – installation examples

Strainpress – installation examples

Strainpress – installation examples

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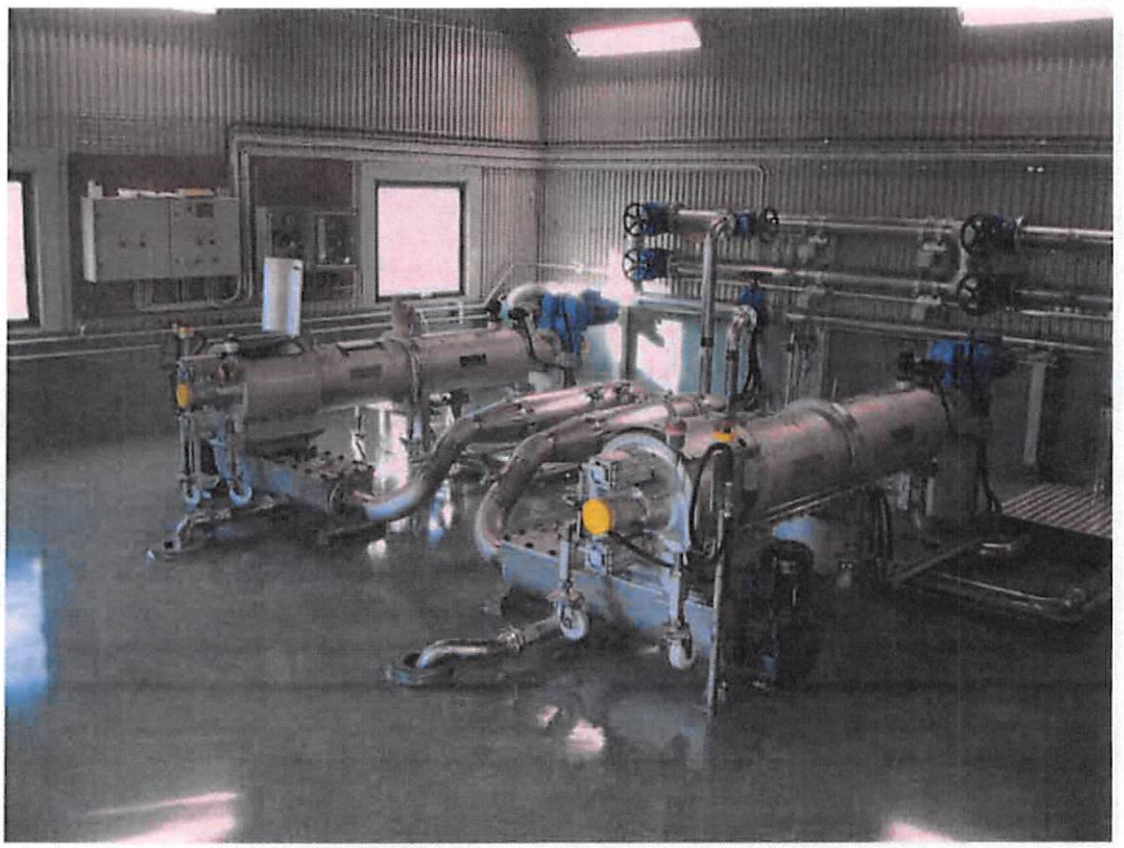
WASTE WATER Solutions



Strainpress – installation examples

HUBER TECHNOLOGY
WASTE WATER Solutions

Huber Technology, Inc.
9735 NorthCross Center, Suite A
Huntersville, NC 28078
www.huber-technology.com

ATTACHMENT 1

Appendix C

Memorandum:
Rationale for Scope of Biosolids Equipment Pre-Selection

ATTACHMENT 1

CDM Smith

Memorandum

To: *Project File*

From: *Bob Huguenard*

Date: *June 12, 2014*

Subject: *City of Franklin, Tennessee*
Franklin WRF Modifications & Expansion Project
Rationale for Scope of Biosolids Equipment Pre-Selection

This memorandum outlines the rationale for establishing the pre-selection scope and identification of potential bidders for the pre-selection of the thermal hydrolysis process (THP) and related equipment. The paragraphs below explain the need for pre-selection and judicious application of equipment pre-selection, outline the development of the pre-selection scope, and explain how the proposed bidders were selected.

Need for Pre-Selection

The decision to pre-select certain biosolids treatment and processing systems was driven by the significant differences in THP systems between suppliers. The differences in equipment requirements were significant enough that CDM Smith would have to do one of the following.

1. Sole source the system supplier and design around that system.

2. Design around a single supplier's system, but allow other suppliers to bid as long as they prepare a revised design. The feasibility of this approach is questionable as the systems are very different and setting up a fair bid would be difficult.

3. Competitively pre-select the equipment/process, and design around the selected process.

The third option was selected because it allows for competitive procurement of the process equipment. In addition, the third option offers an advantage over bidding the equipment through the general contractor; it allows for consideration of life cycle cost rather than capital cost alone. The operation and maintenance (O&M) costs for the options are significant enough that a higher capital cost option could be the lowest life cycle cost option.

Judicious Application of Process Pre-Selection

Competitive pre-selection of process equipment can be advantageous when the systems offered by the suppliers are dissimilar enough that the structures and/or the processes that must be designed

around the equipment cannot be addressed by a single design. In these situations competitive pre-selection that considers life cycle costs, rather than just capital cost, can be very advantageous. However, competitive pre-selection is not always in the buyer's best interest.

The proposed biosolids system consists of numerous components. The major process components include the following.

1. Sludge screening
2. Screened sludge storage
3. Pre-dewatering
4. Thermal hydrolysis
5. Digestion,
6. Digested sludge storage
7. Post sludge dewatering
8. Solar drying

In addition, the following ancillary processes are required.

1. Fats, oil and grease (FOG) receiving
2. Biogas storage
3. Biogas cleaning
4. Combined heat and power generation
5. Auxiliary boilers.

We believe that pre-selection of all of this equipment would represent a huge undertaking and would not be in the best interests of the City for many reasons.

Pre-selection creates a situation where the contractor loses some leverage in the management of schedules, payment dispersion, delivery terms, etc., with the supplier because the terms and conditions of the agreement with the supplier will be set before the contractor bids on the work. This loss of leverage can result in increases in both schedule- and money-related claims.

The loss of leverage can be managed by establishing tight, well-coordinated pre-selection and prime contract specifications. Examples of good coordination include making sure that the prime contract specifications clearly establish the contractor's responsibility for any equipment or services that the supplier is not providing; making sure the pre-selection specifications include the non-technical requirements to which the contractor will be held (*i.e.*, roll down requirements); and making the pre-selection agreement with the supplier part of the contractor specifications.

While mechanisms are available to help manage the risk that comes with pre-selection, expanding the pre-selection scope beyond the limits that are absolutely necessary results in additional risk that is neither necessary nor in the City's best interest. Nesting of pre-selected equipment under a single supplier (where major equipment suppliers are nested under a single prime major equipment supplier) adds even more layers of complexity to the City/consultant/contractor/supplier dynamic and will greatly reduce the contractor's leverage to control the situation. Nesting a supplier under another supplier could make resolution of post-construction issues more difficult. In short, expanding the pre-selection scope beyond what is absolutely necessary greatly increases the contractor's risk. Doing so by allowing nesting of all equipment/processes under a single supplier increases the risk even more.

In addition to the issues identified above, expanding the pre-selection scope beyond the limits that are absolutely necessary will cause the City to lose some control over the specific equipment that is provided for the other processes. The prime supplier in the nesting approach would likely have to work through its suppliers to assemble a bid package for the complete system. That supplier is likely to use all of the leverage at its disposal to put the other equipment it represents in the pre-selection bid package.

Establishing the Process Pre-Selection Scope

The concept of pre-selecting the process equipment for the entire biosolids treatment system is not in the best interest of the City. Instead, the focus should be on the process or processes where pre-selection would provide an advantage to the City as defined in the first paragraph of the previous section. Using this definition, THP is the only biosolids process that would provide benefit through pre-selection. Because we intend to ask for a process guarantee for the THP system, we believe it would be prudent to include the other biosolids processes that have the largest potential to impact the performance of THP in the pre-selection bid request. The resulting pre-selection scope includes the THP equipment, the preceding sludge storage bin and feed pumps, and the subsequent sludge cooling system, sludge dilution system, and digester feed pumps.

Identification of Bidders for the Pre-Selection Process

CDM Smith reviewed the suppliers of THP systems and then identified those suppliers who have a proven track record with this technology. We believe that only two suppliers offer processes that are tested and proven to the degree such that we are comfortable recommending them to the City. Those suppliers are Krüger and Cambi. Therefore, bids will be requested from these two suppliers.

cc: Zack Daniel, CDM Smith
Kati Bell, CDM Smith
Richard Tsang, CDM Smith
Carrie Carden, CDM Smith
Project File

Appendix A

Memorandum: Evaluation of CHP Strategies

ATTACHMENT 1

CDM Smith

Memorandum

To: *Project File*

From: *Glynn MacKenzie, P.E.*
Scott Henriques, P.E., LEED AP O&M

Date: *June 27, 2014*

Subject: *City of Franklin, Tennessee*
Franklin WRF Modifications & Expansion Project
Evaluation of CHP Strategies

As part of the Franklin WRF Modifications & Expansion Project, CDM Smith is designing a new solids treatment process that includes a thermal hydrolysis process (THP), which uses steam to hydrolyze solids before they are fed to the anaerobic digesters. The hydrolysis process enables the digesters to further reduce the quantity of solids to be disposed while increasing production of useful biogas.

Because differing strategies for generating the steam required by THP have emerged, CDM Smith has analyzed the economics of the following four CHP scenarios, which differ in their THP technology and engine loading. The scenarios are also displayed in Table 2.

Scenario 1: The CHP system is sized and loaded to produce the entire steam demand of the Cambi system.

Scenario 2: The CHP system is sized and loaded to produce the entire steam demand of the Kruger Exelys system.

Scenario 3: The CHP system is sized and loaded to consume the biogas produced from the anaerobic digesters.

Scenario 4: The CHP system is sized and loaded to consume the biogas produced from the anaerobic digesters.

Each scenario utilizes a Jenbacher JMS 312 reciprocating engine with Heat Recovery Steam Generator (HRSG) and a THP system by either Cambi or Kruger, the two THP system suppliers under consideration. The JMS 312 energy balance data is depicted in Table 1.

CHP Loading	100%	75%	50%
Gas In (scfm/MBH)	164/5,886	127/4,572	91/3,259
Electricity Output (kW)	633	473	312
Steam Output (lb/hr)	1,156	867	578

Table 1. JMS 312 CHP Energy Balance Data

Scenarios 1 and 2 adjust the engine loading to meet the steam demand of the THP system, called "steam load following," while scenarios 3 and 4 adjust the engine loading to consume 100 percent of the biogas produced in the digesters, called "biogas load following." Firetube boilers, equipped with natural gas and biogas burners, are included to backup (scenarios 1 and 2) or supplement the CHP steam production (scenarios 3 and 4).

CHP Scenario	Design Basis	Equipment Selection	
	Load Following, THP Process	CHP Engine(s)	Boiler(s)
1	Steam, Cambi	2 x JMS 312 Fuel: Natural Gas/Biogas	2 x 1,250 lb/hr Steam Production: 190 psig, saturated
2	Steam, Kruger	2 x JMS 312 Fuel: Natural Gas/Biogas	2 x 1,250 lb/hr Steam Production: 220 psig, saturated
3	Gas, Cambi	1 x JMS 312 Fuel: Biogas	3 x 1,250 lb/hr Steam Production: 190 psig, saturated
4	Gas, Kruger	1 x JMS 312 Fuel: Biogas	3 x 1,250 lb/hr Steam Production: 220 psig, saturated

Table 2. CHP Scenarios Analyzed

For this analysis, two engines, each nominally rated at 633 kW, were used in Scenarios 1 and 2, where the engine load was set to produce the THP steam demand. Without enough biogas to run the engines at these levels, the engine was assumed to be fueled by a blend of natural gas and biogas. Two firetube boilers, each rated at 50 percent of the THP maximum steam demand, acted as a backup, allowing normal THP system operation during CHP maintenance or failure.

In Scenarios 3 and 4, where the engine load was set to consume the biogas produced in the digesters, only one engine was required. However, the firetube boilers were used to supplement the CHP steam production during normal operation, and three units producing 1,250 lb/hr were recommended to ensure plant capacity and reliability. Despite normal engine operation only burning biogas, it is recommended to keep the flexibility of burning natural gas from the grid in the event that biogas becomes unavailable.

The scope of this study included treatment plant flows that increased from 14.6 million gallons per day (mgd) in 2018 to 30.6 mgd in 2040. Capital costs for the boilers and engines were based on a Cleaver Brooks budget quote and the U.S. Environmental Protection Agency's (US EPA) CHP Project Development Handbook. Costs for boilers and engines were estimated at $150,000 per boiler and $1,650 per kW of electric capacity, respectively. Because the engine and HRSG are expected to be installed in outdoor enclosures, the costs of the CHP Plant space were for outdoor pads projected at $600 per cubic yard. Based on vendor provided footprints of 40 ft x 8 ft and 30 ft x 10 ft for the engine and HRSG, respectively, these expected costs are $100,000. Space costs associated with the water treatment, deaerator, and two auxiliary boilers are incorporated in the digester building.

Costs of purchasing natural gas, CHP operation and maintenance, and CHP electricity cost savings were estimated and compared with the CHP's initial capital costs to determine annual savings and payback. The results are shown in Table 3 and will be discussed in detail in this memorandum.

CHP Governor	Steam		Biogas	
THP Process	Cambi	Kruger	Cambi	Kruger
Scenario	1	2	3	4
Estimated CHP Capital Costs ($)	$2,489,000	$2,713,000	$1,639,000	
Payback Year	2025	2025	2024	2025
Lifecycle Profit ($)	$12,056,000	$13,566,000	$10,718,000	$8,322,000

Table 3. Results of CHP Economic Analysis

Background & Design Assumptions

The CHP evaluated in this study was designed to supplement CDM Smith's design of the expansion of the Franklin WRF. Beginning with 14.6 mgd in 2018, incoming wastewater flows have been projected by others to increase 726,000 gallons per day per year, reaching 30.6 mgd in 2040.

From incoming wastewater flow projections, CDM Smith's process mass balance calculations estimated daily flows of solids, both dry and volatile, produced by the liquid treatment process. Utilizing ratios of 1,416 lb of dry solids per million gallons wastewater and 15 cubic feet of biogas produced per pound volatile solids destroyed, the average biogas production in the anaerobic digesters was calculated. For peak (maximum month) production estimates, dry solids production was increased by a peaking factor of 1.3.

THP systems supplied by Cambi and Kruger are being considered for the Franklin WRF. Due to the differences in the THP suppliers' steam requirements evaluated in this study, they were analyzed separately. The Cambi THP process was not only at a lower pressure than Kruger (190 psig vs. 220 psig), but also required less mass flow to hydrolyze the sludge. While the Cambi system demanded 1 pound of steam per pound of dry solids, the Kruger system needed 1.42 pounds.

When supplemental boilers were required, a conservative assumption of no feed water preheating was made. As a result, the boiler required 1,170 BTU_{gas}/lb_{steam} at 80 percent efficiency.

Engine data for the Jenbacher JMS 312 was used as the basis of the analysis, and both costs and performance are scaled proportionally based on the sizes required for each scenario. Values for gas energy input, electricity generated, and steam output were included at full, 75 percent, and 50 percent load. 25 percent load estimates were found by extrapolation. Engine loads presented in this analysis are relative to a single engine, meaning that a 1.5 (150 percent) load fraction would consist of two engines, one at full load and the other at half load (or two at 75 percent).

Assuming constant electric and thermal load profiles, the annual engine setting was set by the varying CHP scenarios, with all of the energy produced by the CHP consumed on site.

Analysis and Results

The CHP scenarios evaluated generally led in two divergent paths. While the CHPs in scenarios 3 and 4 simply utilized the available biogas, Scenarios 1 and 2 expanded their capacity to produce more of the plant's required electric and steam energy. Having been assured that the CHP electrical capacity or steam production would not exceed the plant's electric demand (currently above 1 MW and only growing as the facility expands until 2040) or THP requirements, CDM Smith assumed that all energy produced would be consumed on site.

The economic analysis compared the added costs of this increased capacity to the savings of producing energy on site rather than purchasing from the grid on an average basis. As one would expect, the analysis then greatly depended on the purchasing cost of energy. In 2011, natural gas

and electricity costs were $7.83/MMBTU and $0.095/kWh, respectively, and were expected to escalate at a rate of 3 percent annually. Costs for operation and maintenance (O&M) of the CHP were estimated at $0.016 per kWh_e, based on US EPA's CHP Project Development Handbook. Table 4 shows the results in 2018, the first year of the study. In addition to the complete analysis, the summary tab in Attachment 1 provides a similar breakdown for three representative years (2018, 2030, and 2040).

CHP Scenario	1- Steam, Cambi	2- Steam, Kruger	3- Biogas, Cambi	4- Biogas, Kruger
Biogas Generated (MBH)	2,915	2,915	2,915	2,915
CHP Natural Gas Purchased (MBH)	1,545	3,894	0	0
Aux Boiler Natural Gas Purchased	0	0	509	1,050
CHP Steam Generated (lb/hr)	861	1,220	514	502
Aux Boiler Steam Generated (lb/hr)	0	0	348	718
Electricity Generated (kW)	459	660	270	270
Annual Natural Gas Costs ($)	($130,000)	($328,000)	($43,000)	($89,000)
Annual CHP O&M Costs ($)	($64,000)	($92,000)	($38,000)	($38,000)
Annual Electricity Savings ($)	$455,000	$653,000	$267,000	$267,000
Total Annual Savings ($)	**$260,000**	**$232,000**	**$186,000**	**$140,000**

Table 4. 2018 CHP Scenarios Analysis Results

Scenario 1

For Scenario 1, the CHP was loaded to produce the steam required by the Cambi THP. In 2018, the first year of the study, the required steam output occurred at 73 percent load. However, this loading demanded 4,460,500 BTU/hr (4,460.5 MBH) of gas, of which only 2,915 MBH came in the form of biogas from the anaerobic digesters. The additional 1,545.5 MBH was purchased from the grid as natural gas and blended with the biogas before being sent to the reciprocating engine, at an annual cost of $130,000. O&M of the engine added $64,000. Accounting for the annual electricity savings of $455,000, the CHP provides $260,000 in value for 2018.

This annual savings only increased as the treatment plant's capacity increased. By 2026 (year 9 of the analysis), the load exceeded the capability of a single engine, and the second engine was required to run in tandem. By 2040, the plant incoming average daily flow was expected to grow by more than double that of 2018. Subsequently, the THP demanded more steam flow, and more biogas was created from the digesters. A higher THP steam requirement increased the engine load to 153 percent, meaning that one engine would be at full load while the other was at 53 percent. The added capacity increased the annual natural gas and O&M costs to $514,000 and $135,000, but saved $1,832,000 in electricity, providing an annual savings of $1,183,000.

Scenario 2

Scenario 2 was very similar, but Kruger's 42 percent higher steam demand for the THP increased the engine loading by the same ratio. The effects of increased fuel costs, however, were lessened due to higher electricity savings. Starting at 106 percent loading in 2018 (two engines at 53 percent), the CHP provided $232,000 in savings, which continued to grow with the CHP loading. By the year 2026, the electricity cost rate surpassed a critical point, and the higher electricity savings were greater than the costs of gas and O&M. The tradeoff of electric savings versus gas consumption is typical for CHP processes and is the basis for cogeneration.

The CHP load increased until 2040, when $1,095,000 was spent on natural gas alone, but electrical savings just above $2,664,000 produced an annual savings of $1,373,000.

Scenarios 3 and 4

Unlike the steam load following in Scenarios 1 and 2, Scenarios 3 and 4 were biogas load following, where the CHP engine was run to consume 100 percent of the available biogas. In these cases, the CHP did not completely satisfy the THP steam demand, and supplemental boilers were used in making up the difference. Because Scenarios 3 and 4 had the same gas availability, the engine loading and its corresponding costs (electricity savings and O&M costs) were the same. The difference occurred due to Cambi's lower THP steam demand, resulting in lower natural gas boiler consumption and reduced utility costs. It was apparent, then, that Scenario 4 (Biogas Load Following, Kruger THP) would not provide any advantage over Scenario 3.

Scenario 3 did provided $10,718,000 in lifecycle profits, over $1 million less than Scenario 1 and almost $3 million less than Scenario 2, but the lower capital costs associated with this case resulted in a payback year of 2024, making this option desirable if lower first costs are prioritized.

Conclusions

The CHP's lifespan economic analysis results were shown in Table 3. With two engines and two boilers, the capital costs of Scenarios 1 and 2 are nearly $1,000,000 more than Scenarios 3 and 4, which require three boilers but only one engine. However, the added capital costs of the increased engine capacity are counteracted by the electrical savings, and Scenarios 1 and 2 yield more than an additional million dollars over the life of this study.

Differentiating between Scenarios 1 and 2 is a matter of preference between lifecycle profit and cycle efficiency. It is obvious that Scenario 1's Cambi system is more efficient, requiring less energy to satisfy the system demands. Scenario 2, on the other hand, provides an additional $1.5 million in savings due to its increased engine loading and electrical production.

The economic advantages of Scenario 2 are heavily affected by the volatile utility market, where current natural gas prices are reaching record lows. Should gas prices rise, or electricity prices drop (less likely), the more efficient Cambi THP system in Scenario 1 would provide the most savings.

For those reasons, Scenario 1 is recommended as it provides an efficient method of providing millions of dollars in value to the WRF throughout the duration of this study.

Attachments: CHP Study Tables

ATTACHMENT 1

	CHP Governor	Steam		Gas	
	THP Process	Cambi	Kruger	Cambi	Kruger
	Estimated CHP Capital Costs ($) [1]	($2,488,900)	($2,712,608)	($1,639,349)	($1,639,349)
	Payback Year	2025	2025	2024	2025
	Lifecycle Profit	**$12,055,631**	**$13,566,190**	**$10,717,754**	**$8,321,540**
2018	Biogas Gas Generated (MBH)	2,915	2,915	2,915	2,915
	CHP Natural Gas Purchased (MBH)	1,545	3,894	0	0
	Aux Boiler Natural Gas Purchased (MBH)	0	0	509	1,050
	CHP Steam Generated (lb/hr)	861	1,220	514	502
	Aux Boiler Steam Generated (lb/hr)	0	0	348	718
	Electricity Generated (kW)	459	660	270	270
	Annual Natural Gas Costs ($)	($130,376)	($328,458)	($42,920)	($88,550)
	Annual CHP O&M Costs ($) [2]	($64,379)	($92,454)	($37,776)	($37,776)
	Annual Electricity Savings ($)	$454,676	$652,954	$266,794	$266,794
	Total Savings ($)	**$259,921**	**$232,042**	**$186,098**	**$140,468**
2030	Biogas Gas Generated (MBH)	4,652	4,652	4,652	4,652
	CHP Natural Gas Purchased (MBH)	2,722	5,460	0	0
	Aux Boiler Natural Gas Purchased (MBH)	0	0	688	1,554
	CHP Steam Generated (lb/hr)	1,375	1,947	904	885
	Aux Boiler Steam Generated (lb/hr)	0	0	470	1,062
	Electricity Generated (kW)	729	1,064	483	483
	Annual Natural Gas Costs ($)	($327,419)	($656,714)	($82,712)	($186,866)
	Annual CHP O&M Costs ($) [2]	($102,175)	($149,113)	($67,661)	($67,661)
	Annual Electricity Savings ($)	$1,034,525	$1,509,769	$685,065	$685,065
	Total Savings ($)	**$604,931**	**$703,942**	**$534,693**	**$430,539**
2040	Biogas Gas Generated (MBH)	6,109	6,109	6,109	6,109
	CHP Natural Gas Purchased (MBH) [3]	3,179	6,776	0	0
	Aux Boiler Natural Gas Purchased (MBH) *	0	0	838	1,977
	CHP Steam Generated (lb/hr)	1,805	2,557	1,232	1,205
	Aux Boiler Steam Generated (lb/hr)	0	0	573	1,352
	Electricity Generated (kW)	964	1,402	660	660
	Annual Natural Gas Costs ($)	($513,789)	($1,095,271)	($135,491)	($319,550)
	Annual CHP O&M Costs ($) [2]	($135,050)	($196,446)	($92,535)	($92,535)
	Annual Electricity Savings ($)	$1,831,618	$2,664,293	$1,255,009	$1,255,009
	Total Savings ($)	**$1,182,779**	**$1,372,576**	**$1,026,983**	**$842,924**

[1] Based on $1,650/kWe, $150k per Aux Boiler, $100k CHP space

[2] Based on $0.016/kWhe

[3] Surplus Gas is used to reduce Aux Boiler NG purchased

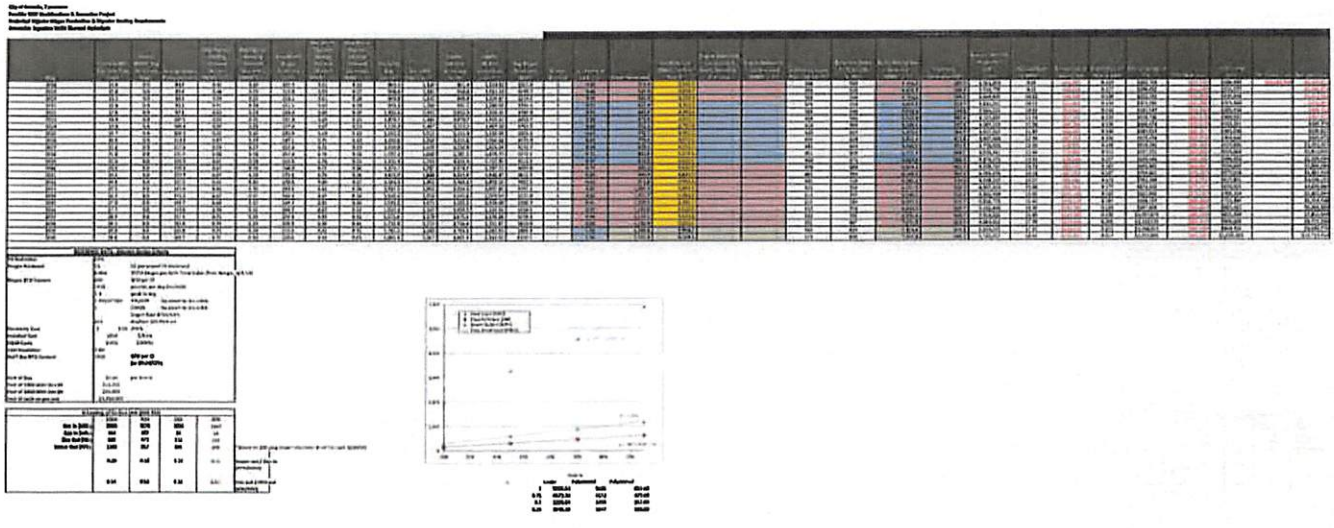
* A negative value indicates Waste Gas Flare/Venting

ATTACHMENT 1

ATTACHMENT 1

ATTACHMENT 1

ATTACHMENT 1



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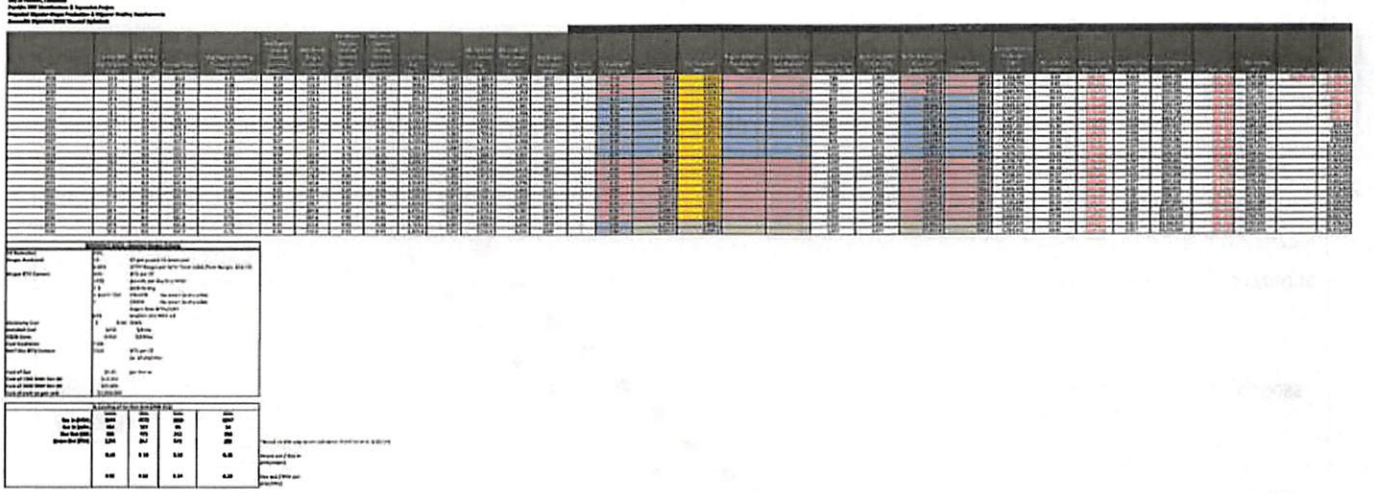

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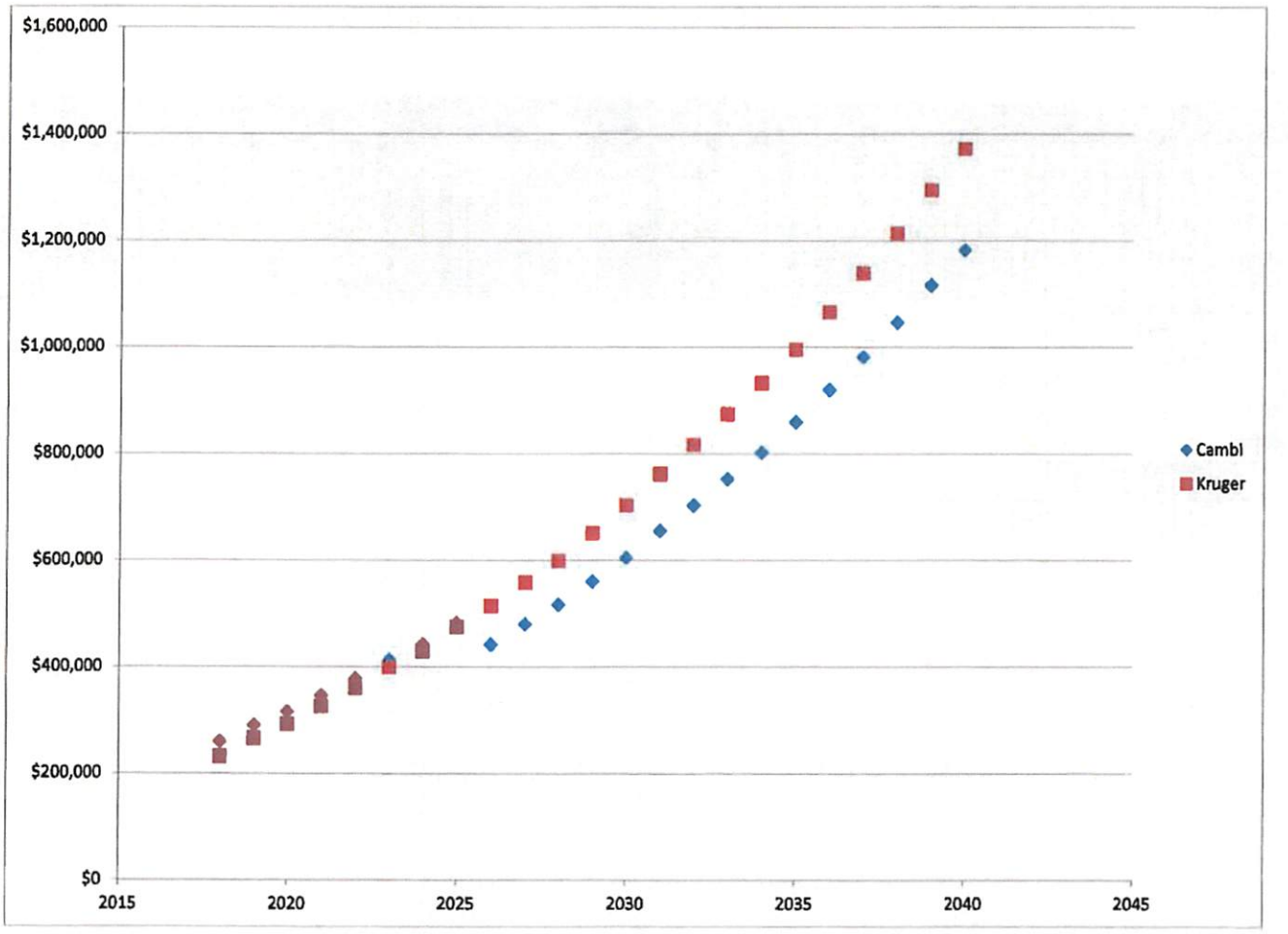

ATTACHMENT 1

Appendix B

Memorandum: Evaluation of Sludge Screening

ATTACHMENT 1

CDM Smith

Memorandum

To: *Bob Huguenard*

From: *K. Richard Tsang*

Date: *June 13, 2014*

Subject: *City of Franklin, Tennessee*
Franklin WRF Modifications & Expansion Project
Evaluation of Sludge Screening

The City of Franklin (the City) is in the process of upgrading its wastewater treatment plant. As part of this upgrade, an entirely new solids processing train will be put in. After a thorough evaluation of biosolids management options, the City has elected to install a thermal hydrolysis process (THP) along with anaerobic digestion to produce Class A biosolids. Solar dryers may be included in the treatment process if market demands dictate the need for a drier product.

In developing the biosolids treatment process train, CDM Smith has considered the need for sludge screening at the head of the treatment process. The general trend in the industry is to add screening to the sludge stream, particularly when the Class A biosolids product will be beneficially used. Although Krüger, one THP system supplier, has informed CDM Smith that screening is not critical for its process, another supplier, Cambi, has indicated that it will be critical to have screening as part of their system.

CDM Smith has found that, in general, O&M costs and effort related to the solids processes can be reduced by screening the sludge. Therefore, we recommend the addition of sludge screening. The reasons to include sludge screening include the following:

1. **Reduce wear on THP system components.** The THP system consists of pressure vessels, pumps, steam injection nozzles, pressure relief valves, transfer valves, instruments, etc., that are subject to wear. The presence of materials such as grit, rags, and other mineral matter will increase wear of these components, which subsequently will affect the frequency of maintenance requirements and the availability of the system for treatment.

2. **Reduce the risk of pressure vessel failure.** Operation of the THP system (particularly the THP system supplied by Cambi) relies on a large number of pumps, pipes and valves to move sludge in and out of vessels. Because of its tendency to plug pumps, pipes, and valves, debris in the sludge will increase the risk of tank and other mechanical component failures. As the cooling system downstream of THP also requires sludge to run through heat

exchangers, screening the sludge will also reduce the risk of plugging and fouling these heat exchangers.

3. **Reduce the frequency of digester maintenance.** Debris that is present in sludge tends to accumulate in the digesters. Over time, the debris will take up space, and it will wear on mechanical equipment such as mixers and pumps. Screening the sludge will reduce the need to clean the digesters. The finished Class A product will also be free of debris such as hair, rags, and plastics, which would reduce its marketability.

The Phase I conceptual level opinion of probable construction cost (OPCC) for the addition of sludge screening is $3,600,000. **Table 1** presents the OPCC. The following assumptions were made in the development of this OPCC.

- Two Huber Technology Strainpress SP4 screens (one duty and one standby) are needed to screen the quantity of sludge that will be processed in Phase 1. Space for the addition of a future third screen, which will be needed to treat future sludge flows, is included. 6mm flow through type, totally enclosed screens are recommended for this application (6mm filtering opening, 6mm compression opening).

- Two screenings dumpsters, similar to those currently used by the City, are included for collection and disposal of the screened material. Space for a future third dumpster will be provided below the future third sludge screen. City trucks will access the dumpsters via a roll-up door in front of each dumpster.

- Addition of the sludge screening facility to the Pre-Dewatering Building will require an additional 2,000 square feet of space. It was assumed that the sludge screening facility will occupy two floors, with the sludge screens located on the upper floor and the screenings dumpsters on the ground floor.

- Odor control will be provided around the screenings dumpsters on the first floor.

- Dedicated lifting equipment will not be provided for the sludge screens. Instead, plant maintenance staff will move the screening equipment into the adjacent pre-dewatering centrifuge room and use that room's bridge crane to transfer the screens to a truck parked in the pre-dewatering truck bay.

- An allowance for upgrades to the existing WAS pumps is included. Larger pumps are required in order to accommodate the added head loss produced by the sludge screens.

Table 1 Opinion of Probable Construction Cost – Sludge Screening Facility

Construction Cost Component	% of Cost	Cost
Process Equipment & Piping		
Sludge Screens (1 duty + 1 standby, space for 1 future)	n/a	$320,000
Air Compressor System	n/a	Included
Screenings Dumpsters	n/a	$2,000
Allowance: Monorail & Hoist	n/a	$0
Allowance: Odor Control for Sludge Screenings Room	n/a	$100,000
Allowance: WAS Pumping Upgrades	n/a	$200,000
Structure		
Sludge Screen Building (Part of Pre-Dewatering Building)	n/a	$593,400
Demolition		
None	n/a	$0
Labor, Construction Equipment & Misc. Material	30.0%	$186,600
Site Preparation	5.0%	$60,770
Piping	15.0%	$210,300
Electrical/I&C	25.0%	$303,850
Total Direct Costs		**$1,976,920**
Permits	0.5%	$9,885
Sales Tax	9.5%	$59,090
Builder's Risk	0.5%	$18,000
General Liability	1.0%	$36,000
Bonds & Insurance	1.5%	$54,000
Subtotal Prior to OH&P		**$2,153,895**
General Conditions	10.0%	$215,389
Contractor's Overhead & Profit	10.0%	$215,389
Subtotal with OH&P		**$2,584,674**
Construction Contingency	30.0%	$775,402
Total Cost at Today's Dollars		**$3,360,076**
Escalation to Midpoint of Construction	6.8%	$227,507
TOTAL CONCEPTUAL CAPITAL COST		**$3,600,000**

cc: Carrie Carden

Attachments:

Cambi sludge feed specification
Huber Strainpress SP4 Brochure

ATTACHMENT 1

GENERAL THP FEED SPECIFICATION

Client
N/A

Document title
General THP Feed Specification

Project title
Cambi Standardisation Programme

Cambi document number

901003	P	SP	002	A03
Project no	*Discipline*	*Doc type*	*Sequence no.*	*Revision no.*

Client document number
N/A

Revision history

Rev	*Date*	*Issue*	*Made by*	*Checked by*	*Approved by*	*Client approval*
A01	16.08.2012	Issued for Information	JK	OES	MN	N/A
A02	24.01.2013	Issued for Information	MD	OES	PJN	N/A
A03	02.09.2013	Issued for Information	BF	HRH	PJN	N/A

CAMBI

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THP FEED SPECIFICATION

1. GENERAL

The following specification describes our requirements to the feed streams to the THP.

The Cambi THP has two alternative designs, one for treatment of waste-water treatment sludge only, and one for treatment of biowaste. The feed-stock requirements for these models are described in separate sections below.

Specific local requirements (national/regional laws, regulations etc.) are not considered in the feed specifications. Fulfilment of these requirements must be evaluated for each region.

Treatment of waste-water treatment sludge is relevant for all models; B2, B6 and B12.
Treatment of biowaste is relevant for B12 and B6.

For all types of waste, it must not contain toxic substances in concentrations that inhibit the process in downstream bioreactors.

2. CAMBI THP FOR WASTE-WATER SLUDGE

Cambi Requirements:

Operation	Continuous
Accepted feed-streams	• Primary sludge • Secondary / Waste Activated sludge • Fat-Oil-Grease (from waste-water inlet separation/treatment) • Pre-treated septic
Feed-stream mixture	The different feed-streams shall be fed to the THP at a constant mixture relation (recipe). Relative variation on any fraction shall not be more than 20% on a daily basis.
Dry solids concentration to pulper;	Maximum 18.5%DS. Design should be maximum 16.5%DS to allow for unintended variations. Lower dry solids concentrations will increase specific steam consumption (t steam/t dry solids). Dry solids concentrations below ~2%DS will cause increased vibrations and wear on equipment.
Dry solids variation to pulper;	An hourly variation of +/- 2% point is acceptable
Feed stream temperature	Minimum 5°C Maximum 30°C
Chloride content:	<400 mg/l
Abrasive material limitation	Abrasive materials defined by ash particles >150 micron Max 100 kg/day >150 micron with a particle size distribution (by mass): Max 50% more than 200 micron max 5% more than 700 micron
Sludge quality:	The sludge shall be screened to remove rags. Any other industrial effluents coming into the plant shall also be pre-treated in order not to cause operational problems in the water treatment and the sludge treatment as per EU Waste-water Directive.

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City of Franklin
Water Reclamation Facility Upgrades

Tennessee Department of Environment and Conservation (TDEC)
Clean Tennessee Energy Grant Program
Combined Heat and Power (CHP) Emissions Calculations

Emission calculations were performed to compare the emissions generated utilizing a combined heat and power (CHP) system to the emissions generated by a baseline conventional production system (central station power plant) in order to estimate the reduction in greenhouse gas emissions. The calculations were performed using the CHP Emissions Calculator from the US Environmental Protection Agency (EPA) Combined Heat and Power Partnership. The calculations were performed for both year 2018 (anticipated start-up of facility) and year 2040 (current planned expansions) as the production of digester gas will increase over time; and therefore, the offset in greenhouse gases will increase over time. The results for the proposed CHP system are based on power being generated on-site using gas generated from the anaerobic digesters, and heat being recovered from the generator engine for on-site process usage and facility heating. The results for the baseline system are based on power being purchased from the grid (from coal-fired power plant), and natural gas purchased from the local provider being used for heating of water in a boiler for process usage and facility heating.

The results show that the total tons of greenhouse gases (in CO2 equivalents) are reduced by 58-62% from 5,188 - 5,791 tons to 2,199 tons in year 2018, and from 10,895 – 12,162 tons to 4,618 tons in year 2040. These results include a 50% diversity factor to account for intermittent thermal demands of the system.

In addition to the reduction in greenhouse gases noted above, the CHP system will result in elimination of emissions that would have been produced by flaring of the digester gases. This represents an additional reduction of total greenhouse gases of 1,474 tons in 2018, and 3,111 tons in 2040, resulting in total emissions reduction ranging from 67 to 70 percent for the overall system.

RESOLUTION 2016-59

A RESOLUTION ADOPTING AND UPDATING THE BICENTENNIAL PARK MASTER PLAN

WHEREAS, on April 12, 2016, the Board of Mayor and Aldermen approved a Professional Services Agreement (COF 2016-0064) with Barge Waggoner Sumner & Cannon, Inc. to update the Bicentennial Park Master Plan and provide schematic designs; and

WHEREAS, the primary purpose of the updated master plan is to define expectations for the use of the Park and to assist in decision-making regarding capital improvements and other changes proposed in the Park; and

WHEREAS, over the last few years, the Board of Mayor and Aldermen invested over $6,100,000 into Bicentennial Park to include the extension of 3rd Ave North, the Harpeth River Trail, Point Park and the Fourth Avenue Overlook; and

WHEREAS, the Bicentennial Park Master Plan generally includes environmental remediation work, repairs and renovation to the pavilion structure, restrooms, river overlooks, stormwater enhancements and other passive elements as shown on Bicentennial Park – Schematic Site Plan (Exhibit A);

WHEREAS, the Bicentennial Park Master Plan will be reevaluated and updated, as approved by the Board of Mayor and Aldermen, following the completion of the downtown parking study.

NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF MAYOR AND ALDERMEN OF THE CITY OF FRANKLIN, TENNESSEE, that the Bicentennial Park Schematic Site Plan (Exhibit A) is hereby adopted as depicted in Exhibit A attached hereto.

IT IS SO RESOLVED AND DONE on this the ____ day of _____, 2016.

ATTEST:

By:_____

ERIC S. STUCKEY
City Administrator/Recorder

CITY OF FRANKLIN, TENNESSEE:

By: _____

DR. KEN MOORE
Mayor

Approved As To Form By:

_____

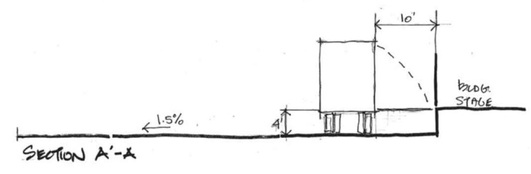
Shauna R. Billingsley
City Attorney

Law Dept. approved 09.22.16

KEY

- REINFORCED TURF
- SPECIALTY PAVEMENT
- PLANTING BED
- SHADE TREE
- EXISTING STRUCTURES
- PROPOSED BUILDING
- PUBLIC ART/SCULPTURE
- CONCRETE WALK
- EXISTING TREES
- 13 VIRTUES OF BENJAMIN FRANKLIN STATUES
- SMALL FLOWERING TREE
- SITE BOUNDARY
- FLOODWAY LINE
- VEHICULAR ENTRY/ACCESS

13 VIRTUES OF BEN FRANKLIN SCULPTURES



STAGE TRUCK ACCESS SECTION

LEGEND

1. PARK ENTRY/GATEWAY
2. PARK ENTRY PLAZA
3. PARK SHELTER
4. ELEVATED RESTROOM BUILDING
5. SPECIALTY PAVEMENT REPRESENTING HISTORIC INTER-URBAN RAIL
6. VERTICAL ARCHITECTURAL ENTRY FEATURES
7. PEDESTRIAN PLAZA WITH INTERPRETIVE SIGNAGE
8. TRELLIS COVERED PLAZA, FLUSH WITH EXISTING BUILDING
9. AT GRADE ENTRY TO EXISTING PAVILION
10. RAISED PLANTERS (TYP)
11. FLEXIBLE PARKING / PLAZA AREA (+/- 56 SPACES)
12. COVERED STAGE / PLAZA
13. STADIUM SEATING
14. RADIAL ACCENT PERVIOUS PAVING
15. RAMP INTO EXISTING PAVLION
16. EXISTING DUST COLLECTOR ENTRY FEATURE
17. PEDESTRIAN BRIDGE
18. ENTRY PLAZA
19. WATER QUALITY POND / DRAINAGE SWALE
20. REINFORCED TURF PARKING (+/- 197 SPACES)
21. SPACE FOR PORTABLE TOILETS
22. STONE WALL w/ ACCENT PIERS
23. BUS PARKING (3 SPACES)
24. GREENWAY CONNECTION
25. OUTDOOR LAWN EVENT SPACE
26. ON STREET PARALLEL PARKING
27. GARBAGE RECEPTACLE
28. ENTRY/TRUCK ACCESS RAMP
29. BIKE STATION
30. ROTATING PUBLIC ART EXHIBITS

BICENTENNIAL PARK - *SCHEMATIC SITE PLAN*

CITY OF FRANKLIN, TN

AUGUST 9, 2016

NORTH

0 25' 50' 100'

SCALE 1"=50'

BWSC

FILE NO: 35\35968\3596801\04_CAD\LAND

INDUSTRIAL DUST COLLECTOR

EXISTING PAVILION

DRY STACK STONE WALLS

HISTORIC SITE ELEMENTS/ MATERIALS

CONCRETE PAVERS

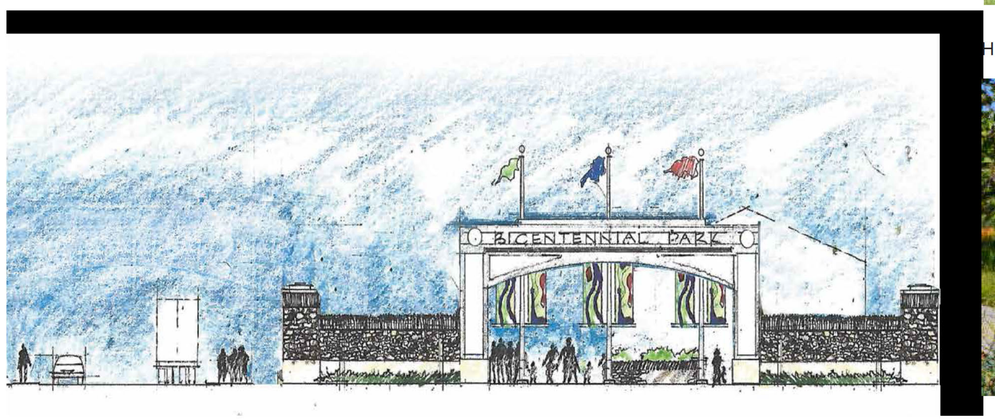
DRY STACK STONE WALLS

STAMPED CONCRETE

DESIGN ELEMENTS/ MATERIALS

BANNERS / FLAGS

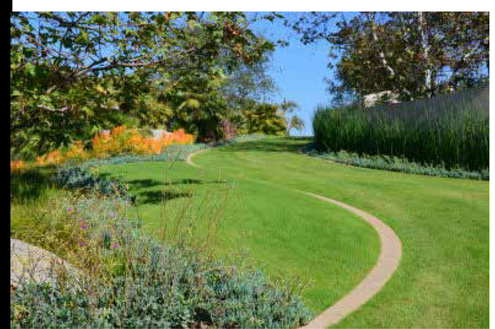
ARCHITECTURAL GATEWAY FEATURE

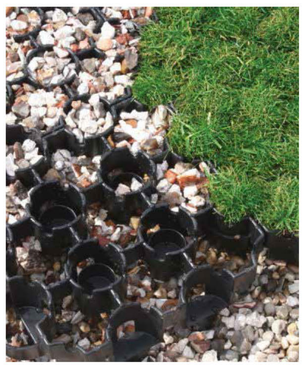


PARK ENTRY CONCEPT

LIGHT DUTY - GRASS PROTECTA

HEAVY DUTY - BODPAVE85





REINFORCED TURF

ARCHITECTURAL ENTRY FEATURE

VERTICAL DESIGN ELEMENTS

BICENTENNIAL PARK - *IMAGE BOARD*

CITY OF FRANKLIN, TN

AUGUST 9, 2016

BWSC

FILE NO: 35\35968\3596801\04_CAD\LAND

BWSC | BARGE WAGGONER SUMNER & CANNON, INC.®

August 10, 2016
File Number 35968-01

Ms. Lisa Clayton
City of Franklin Parks
P. O. Box 305
Franklin, Tennessee 37605

RE: Bicentennial Park Schematic Site Plan

Dear Ms. Clayton:

Attached you will find the rendered schematic site plan and an image board for Bicentennial Park for submission to the Capital Investment Committee. This correspondence provides a description of the schematic plan. The text in this letter is keyed with the numbers in parentheses corresponding to the legend on the plan.

A preliminary grading plan has been prepared and we have run pre and post development HEC-RAS flood models to determine if the improvements as proposed would have any impact on flood water elevations. The results of our analysis indicate that a "no rise" condition would exist after construction of the proposed improvements described herein and illustrated on the plan. We documented this evaluation through a letter to Jonathan Marston in the Engineering Department on August 8, 2016. Most of the park lies within the floodway (floodway line is a blue dashed line on the plan) and the flood elevation is approximately 6' above the finish floor elevation of the pavilion. Therefore, special care will have to be given to the design of all the park elements given that they will be subject to flooding.

Existing Pavilion – The existing pavilion is the centerpiece of the plan. While the specific details will be worked out later in the design process, improvements to the pavilion will include some needed structural repairs, addition of a fire suppression system, painting the structure, addition of ceiling fans, LED lighting and electrical service for vendors and performances, railings around the perimeter where needed, ADA ramps on the north end of the pavilion, re-surfacing of the concrete floor and potentially a new roof (would be bid as an alternate). A ramp (5) will be provided on the south end of the building so that service and delivery trucks can access the floor slab. A loading dock is proposed in the northwest corner of the building. The north side of the building would be accessible by tractor trailer in order to allow for access by trucks with fold down stages for musical performances. Hose bibs would be installed as a water source and for cleaning the pavilion floor.

Entry Gateway and Plaza (1, 2) – The main entry plaza will be at the intersection of 3rd Avenue and North Margin Street. A proposed entry gateway feature can be seen on the attached image board as can some potential paving material types for the plaza. A stone wall and accent piers (22) would extend from the entry along North Margin Street.

Pavilion and Restroom (3, 4) – A new small pavilion is located on the left past the gateway entrance and a new restroom is to the right. The restroom will be sized to serve normal daily park use; a concrete pad is provided (27) for portable toilets to serve large events. The restroom building finish floor will be elevated approximately 6' above existing grade to get the floor above the flood elevation. Ramps will provide accessibility to the building.

Inter-Urban Rail (5) – Specialty pavement and interpretive signage would identify the route of the Inter Urban Rail line that ran through the site.

Vertical Elements (6) – Vertical architectural elements are proposed on each side of the south end of the pavilion and a new facing, possibly with the park name, will be added to the south end of the pavilion structure.

Pedestrian Plaza (7) – A large outdoor gathering space/plaza is proposed on the southeast corner of the building. Along the outer edge of the space, sculptures are proposed that interpret the 13 virtues of Benjamin Franklin.

Trellis (8) – An overhead trellis is proposed on the east side of the pavilion; the space under the trellis would be paved and flush with the pavilion floor providing an extension of the pavilion space. This would provide a good space for tables and chairs for outdoor dining.

Planters (10) – Raised planters are introduced on the west side of the pavilion to provide for pedestrian access (9) to the pavilion.

Parking (11) – A parking lot with approximately 56 spaces is located on the west side of the pavilion. This area would be filled such that there would be at grade access to the pavilion's west side from the parking lot and a constant slope to 3rd Avenue. The paving of the lot would be done such that it would be attractive and provide plaza space for outdoor events by closing the parking lot.

Stage/Plaza (12) – The stage would be an extension of the pavilion floor and could be used for smaller outdoor performances with spectators sitting on the outdoor lawn event space (25). A series of steps down from the stage (13, Stadium Seating) would provide seating for events that would be held on the outdoor event lawn space.

Dust Collector Gateway Feature (16) – The existing dust collector structure would be repaired/refurbished and would function as an arch entry feature for those entering the park from the parking to the east (20). It would also provide a sculptural element to the users of the park and pavilion.

Bridge (17) – A pedestrian bridge would be added to provide access across the existing drainage way. The developers of Harpeth Square will be installing some water quality features along the drainage way (19). An entry plaza (18) would be added on the east side of the bridge.

Reinforced Turf Parking/Open Play Space (20) – This area of reinforced turf would provide parking for approximately 197 vehicles only during special events (could not be used for daily parking as the grass would not survive). The turf (grass) would have a reinforcing mat under the grass blades that would allow for problem free parking even in wet weather. The reinforcing mat would not be visible once the grass grows through it. The area could be used for informal play (Frisbee, kite flying, pick up soccer games, etc.) when not being used for parking. This area of the park was an old City dump site and the waste material is very close to the surface in many places. A layer of soil/waste will be removed to provide for a smooth and safe surface and topsoil imported as the root zone for the turf. The area will be irrigated (as will all landscaped or grassed areas within the park). On street parking would be added across North Margin Street in the future with the extension of 1st Avenue.

Additional reinforced turf parking for approximately 245 cars could be available if the City acquires and develops the Worley property across North Margin Street.

Bus Parking (23) – Three bus parking spaces would be provided along 3rd Avenue to accommodate tour and other buses visiting the park or the downtown area as a whole.

Greenway Connector (24) – A new multi-use path would run along North Margin Street and tie into the existing greenway along the Harpeth River.

Outdoor Lawn Event Space (25) – This open lawn area can be used for seating for performances on the Stage/Plaza (12) or the location of a tent for very large gatherings in the park. A connecting path would run north through the park also intersecting with the recently constructed section of the greenway. Space is provided along this path for rotating public art exhibits (30).

We believe that the design of the park will provide a wonderful gathering space for large events as well as passive park amenities to serve the citizens of Franklin as well as visitors. We will be in attendance at the Capital Investment Committee meeting on August 25 and be available to answer any questions the committee may have.

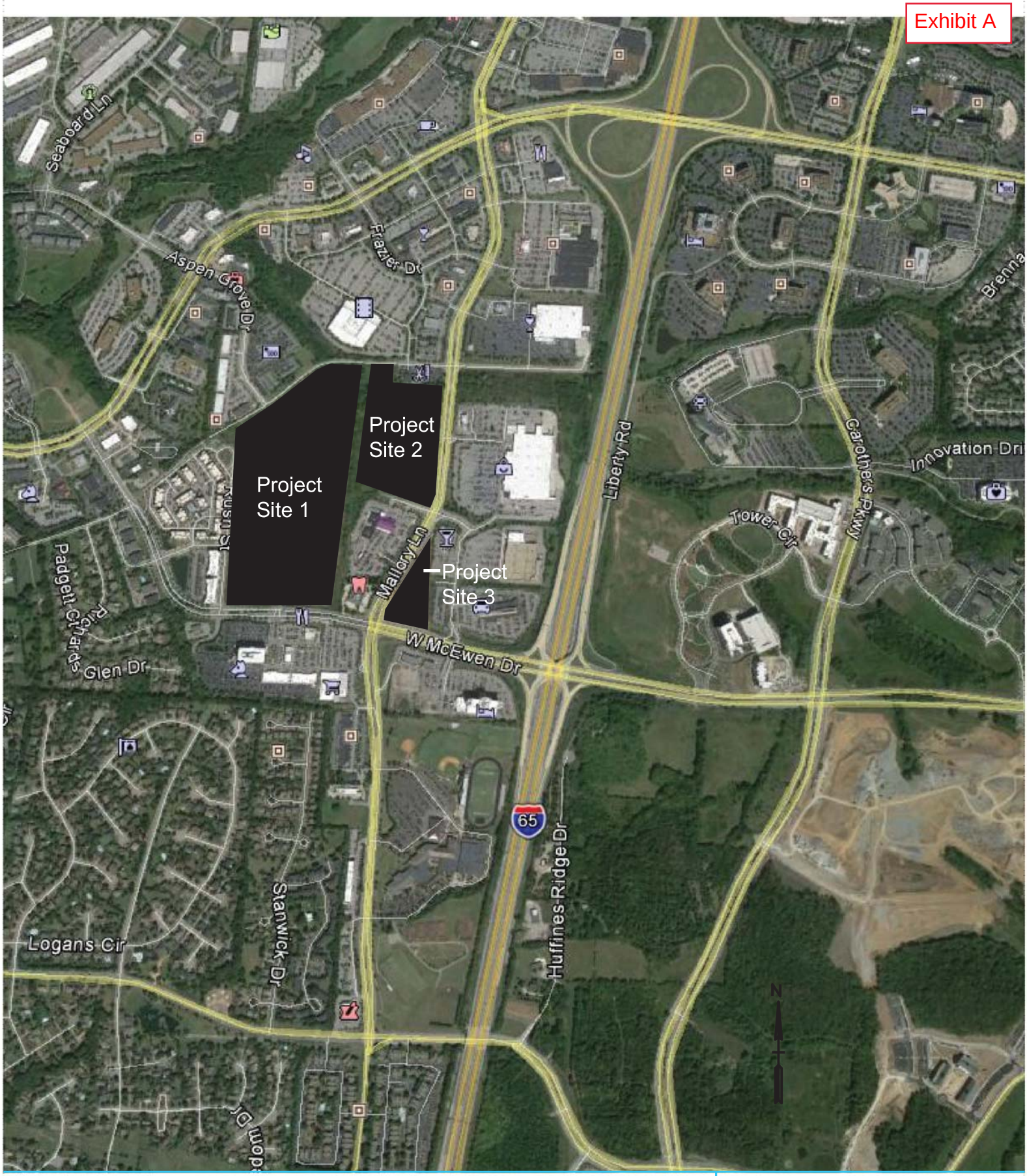
Sincerely,

Steven A. Fritts

Steven A. Fritts, ASLA, LEED AP BD+C
Vice President

Copy To: Paula Harris, Matt Fell

Exhibit A



VOLKERT

330 Mallory Station Road, Suite A-1
Franklin, TN 37067
Telephone: 615.656.1845
www.volkert.com

Figure 1. Study Area

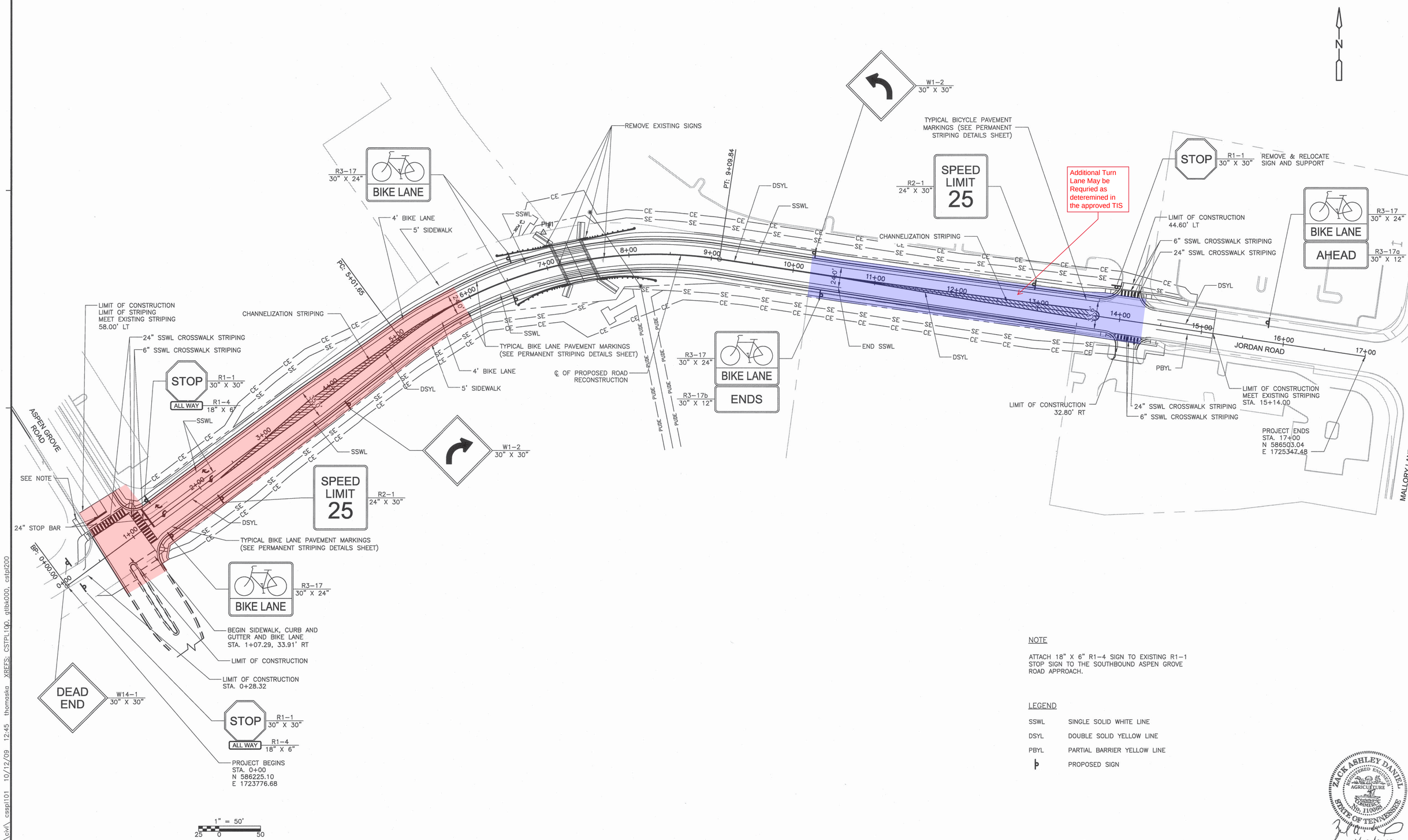
SCALE: N.T.S.

Exhibit B

McEwen Economic Development Area 08/31/2016

DISCLAIMER
This map was created by the City of Franklin's MIT Department and was compiled from the most authentic information available. The City is not responsible for any errors or omissions contained hereon. All data and materials Copyright © 2015. All Rights Reserved.

Exhibit C



NOTE

ATTACH 18" X 6" R1-4 SIGN TO EXISTING R1-1 STOP SIGN TO THE SOUTHBOUND ASPEN GROVE ROAD APPROACH.

LEGEND

SSWL	SINGLE SOLID WHITE LINE
DSYL	DOUBLE SOLID YELLOW LINE
PBYL	PARTIAL BARRIER YELLOW LINE
⊢	PROPOSED SIGN

ZACK ASHLEY DANIEL
REGISTERED ENGINEER
AGRICULTURE
LICENSE NO. 110008
STATE OF TENNESSEE
1/29/2010

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: S. MURPHY
DRAWN BY: S. MURPHY
SHEET CHK'D BY: C. LIGGETT
CROSS CHK'D BY: C. KINCAID
APPROVED BY: Z. DANIEL
DATE: JANUARY 2010

CDM
Camp Dresser & McKee Inc.
Parkview Towers
210 25th Avenue North, Suite 1102
Nashville, TN 37203
Tel: (615) 320-3161
consulting • engineering • construction • operations

City of Franklin

RECONSTRUCTION OF JORDAN ROAD

PERMANENT SIGNING AND STRIPING PLAN

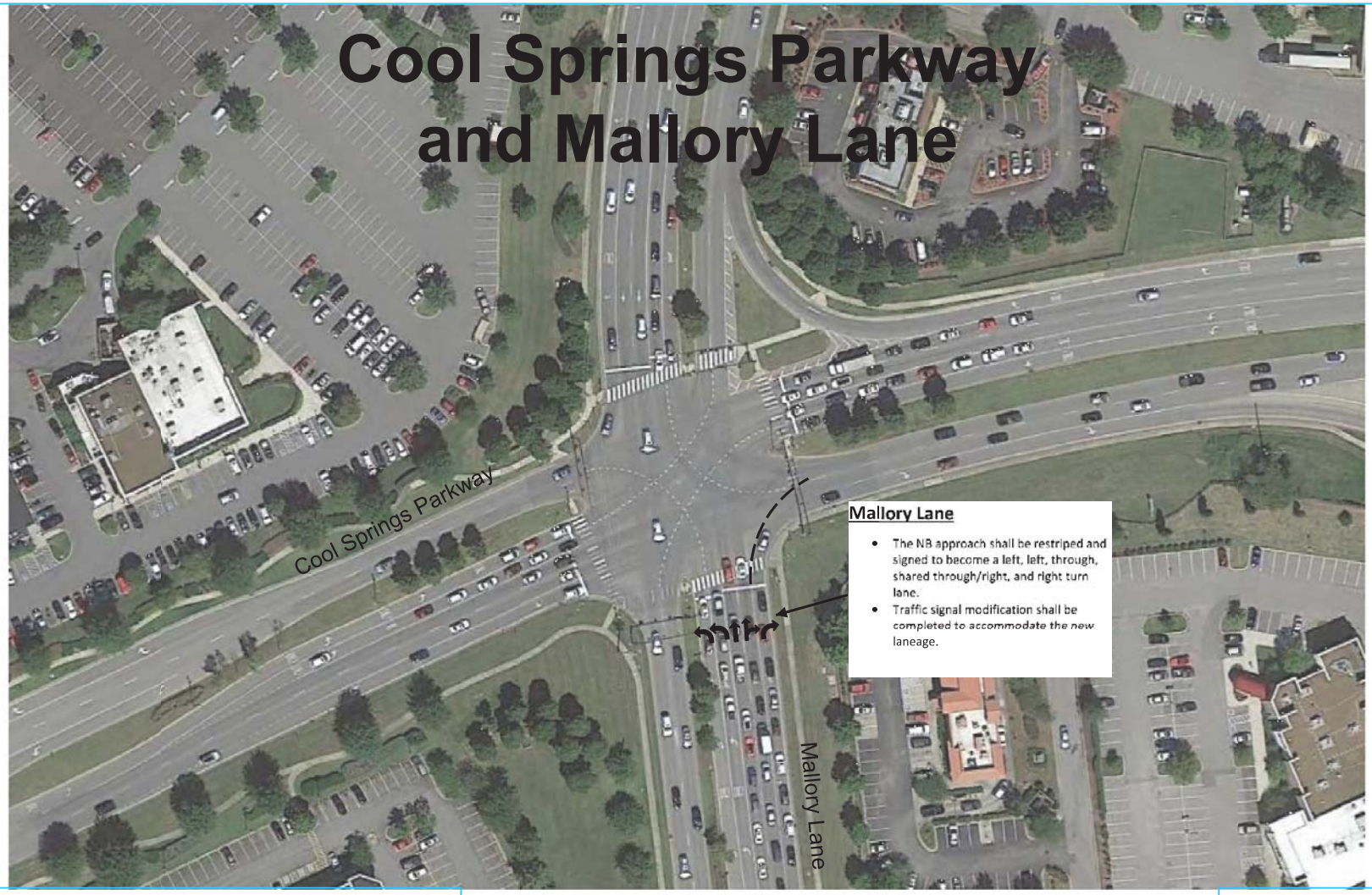
PROJECT NO. 14915-62910
FILE NAME: CSSPL101

SHEET NO.
SP-1

100% SUBMITTAL

W:\14915\62910\100p\civ\ cssp101 10/12/09 12:45 thomaska XREFS: CSTPL100, gtlbk000, cstpl200

Exhibit D



VOLKERT
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www.volkert.com

Recommended Lane Configuration
Figure 10

SCALE: NTS

Exhibit E
PG 1 of 5

Table 12 – Mallory Lane / Liberty Pike Analysis

	2015 Existing						2020 Background					
	AM		MD		PM		AM		MD		PM	
Overall	C (25.1 s)		F (85.8 s)		F (99.2 s)		C (28.0 s)		F (102.9 s)		F (118.0 s)	
EBL		B (11.9 s)		B (19.7 s)		C (29.4 s)		B (16.0 s)		C (20.5 s)		D (41.7 s)
EBT	B (13.0 s)		C (21.9 s)		C (27.8 s)		B (17.7 s)		C (23.8 s)		C (34.7 s)	
EBR		B (14.3 s)		C (24.3 s)		C (26.3 s)		B (19.3 s)		C (27.0 s)		C (29.4 s)
WBL		B (14.5 s)		C (23.0 s)		C (20.6 s)		B (17.6 s)		C (23.0 s)		C (27.7 s)
WBT	B (17.6 s)	B (18.7 s)	C (26.4 s)	C (27.9 s)	C (23.2 s)	C (24.9 s)	C (21.6 s)	C (23.3 s)	C (27.2 s)	C (29.0 s)	C (26.3 s)	C (26.7 s)
WBR		B (17.6 s)		C (27.4 s)		C (21.9 s)		C (21.6 s)		C (28.6 s)		C (22.7 s)
NBL		D (37.0 s)		D (35.6 s)		F (82.9 s)		D (38.7 s)		D (36.5 s)		F (98.2 s)
NBT	D (44.1 s)	D (44.8 s)	D (36.9 s)	D (37.0 s)	D (48.6 s)	D (39.9 s)	D (47.3 s)	D (48.2 s)	D (39.0 s)	D (39.3 s)	D (52.0 s)	D (40.2 s)
NBR												
SBL		D (37.6 s)		C (29.4 s)		C (33.2 s)		D (39.4 s)		C (30.1 s)		D (43.1 s)
SBT	D (36.4 s)	D (43.1 s)	F (159.1 s)	F (275.3 s)	F (190.9 s)	F (290.3 s)	D (36.7 s)	D (43.2 s)	F (201.8 s)	F (362.7 s)	F (240.2 s)	F (364.9 s)
SBR		C (29.1 s)		C (28.2 s)		F (131.9 s)		C (28.3 s)		C (29.1 s)		F (182.6 s)

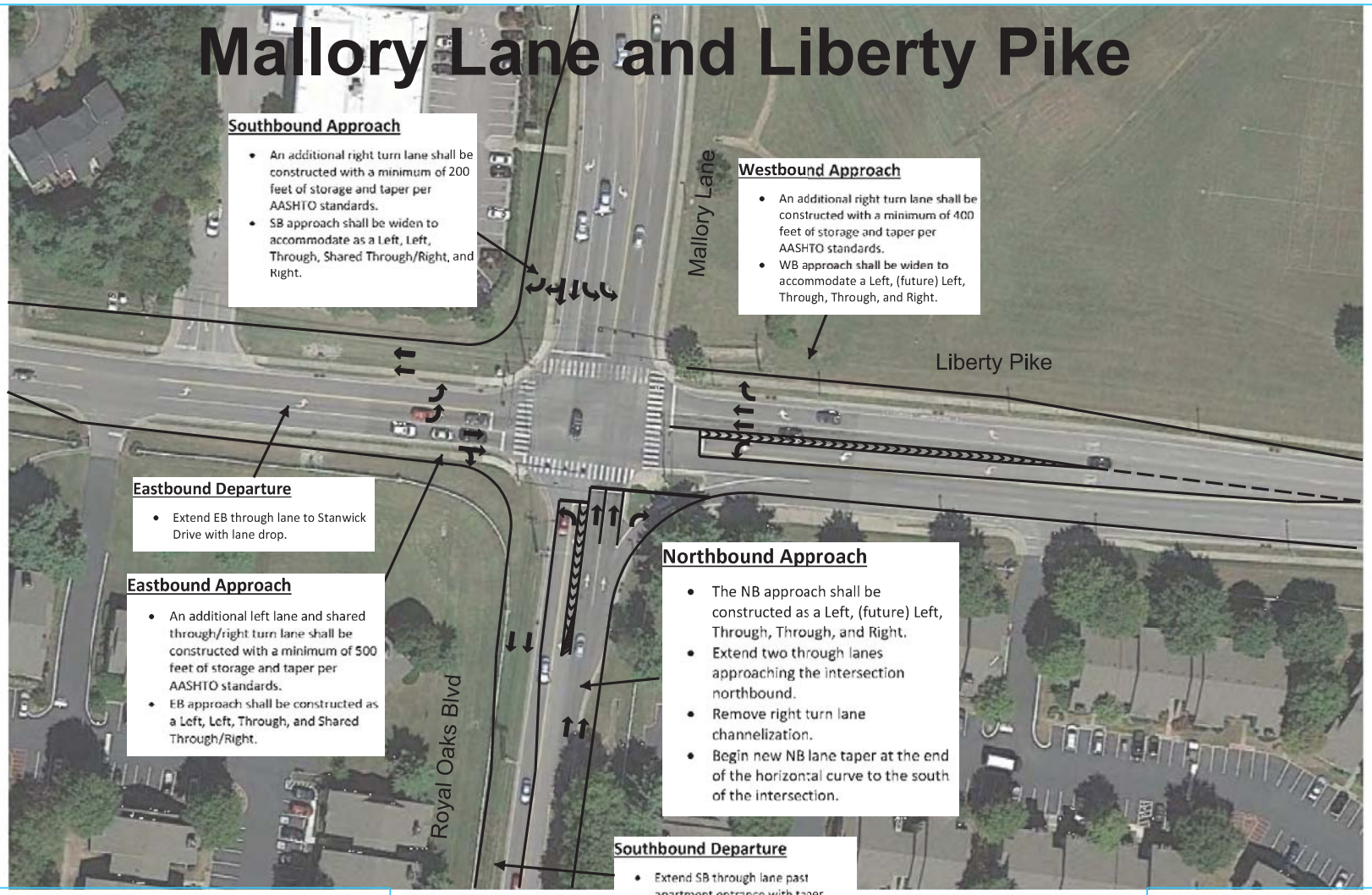
	2020 Buildout (no improvements)						2020 Full Buildout (Improvements)					
	AM		MD		PM		AM		MD		PM	
Overall	C (28.9 s)		F (113.0 s)		F (199.7 s)		D (38.3 s)		D (38.5 s)		D (45.0 s)	
EBL		B (18.1 s)		C (20.2 s)		E (58.4 s)		D (52.7 s)		E (57.3 s)		E (67.4 s)
EBT	B (18.6 s)		C (22.3 s)		D (42.7 s)		D (359 s)	B (17.6 s)	D (40.2 s)	C (20.5 s)	D (50.1 s)	D (35.4 s)
EBR		B (19.2 s)		C (24.8 s)		C (29.4 s)						
WBL		B (17.5 s)		C (23.2 s)		C (27.8 s)		C (20.2 s)		C (24.1 s)		C (33.0 s)
WBT	C (22.1 s)	C (23.9 s)	C (26.8 s)	C (28.3 s)	C (26.3 s)	C (26.8 s)	C (24.6 s)	C (26.0 s)	C (25.9 s)	C (26.7 s)	D (38.2 s)	D (41.1 s)
WBR		C (22.3 s)		C (24.8 s)		C (22.9 s)		C (25.1 s)		C (26.2 s)		D (37.9 s)
NBL		D (37.2 s)		D (36.0 s)		F (98.7 s)		D (36.1 s)		C (33.3 s)		D (36.6 s)
NBT	D (47.2 s)	D (48.1 s)	D (37.9 s)	D (38.1 s)	D (51.7 s)	D (41.2 s)	D (46.9 s)	D (49.2 s)	D (38.7 s)	D (40.1 s)	D (39.1 s)	D (40.8 s)
NBR								D (41.2 s)		C (32.9 s)		D (35.5 s)
SBL		D (36.4 s)		C (30.0 s)		E (57.6 s)		E (57.3 s)		E (55.1 s)		E (74.4 s)
SBT	D (35.5 s)	D (43.8 s)	F (220.2 s)	F (389.9 s)	F (427.2 s)	F (596.0 s)	D (44.3 s)	D (41.2 s)	D (40.9 s)	D (42.3 s)	D (48.3 s)	D (46.7 s)
SBR		C (26.4 s)		C (29.4 s)		F (382.5 s)		D (39.9 s)		C (32.1 s)		C (34.1 s)

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)

Mallory Lane and Liberty Pike



Southbound Approach

- An additional right turn lane shall be constructed with a minimum of 200 feet of storage and taper per AASHTO standards.
- SB approach shall be widen to accommodate as a Left, Left, Through, Shared Through/Right, and Right.

Westbound Approach

- An additional right turn lane shall be constructed with a minimum of 400 feet of storage and taper per AASHTO standards.
- WB approach shall be widen to accommodate a Left, (future) Left, Through, Through, and Right.

Eastbound Departure

- Extend EB through lane to Stanwick Drive with lane drop.

Eastbound Approach

- An additional left lane and shared through/right turn lane shall be constructed with a minimum of 500 feet of storage and taper per AASHTO standards.
- EB approach shall be constructed as a Left, Left, Through, and Shared Through/Right.

Northbound Approach

- The NB approach shall be constructed as a Left, (future) Left, Through, Through, and Right.
- Extend two through lanes approaching the intersection northbound.
- Remove right turn lane channelization.
- Begin new NB lane taper at the end of the horizontal curve to the south of the intersection.

Southbound Departure

- Extend SB through lane past apartment entrance with taper ending at the beginning of the horizontal curve.

VOLKERT
330 Mallory Station Road, Suite A-1
Franklin, TN 37067
Telephone: 615.656.1845
www.volkert.com

Recommended Lane Configuration
Figure 11

SCALE: NTS

Exhibit E
PG 4 of 5

Project # ST16011

Project Name Mallory/N Royal Oaks & Liberty Intersection Imp.

Department Streets
Contact Engineering Director
Type Improvement
Useful Life 20+
Category Transportation
Priority 3 Star Project
Status Pending

Total Cost $4,440,000

Description

Intersection improvements to North Royal Oaks Boulevard, Liberty Pike and Mallory Lane. This intersection is projected to be at a failure level in the next 3-4 years based on the proposed development along Carothers Parkway. If this porject is not completed, there will be significant delays at this key intersection.

Justification

Congestion Mitigation: It is anticipated that this roadway will reach failure levels within the next 5 years. The increased traffic is a result of all the development along Carothers Parkway and other areas within Cool Springs.

Safety: No existing safety concerns at this intersection. Pedestrian facilities should be incorporated to the intersection improvements to comply with the Cities master plan.

Economic Development: Redevelopment and future economic development in the Cool Springs area continues. This improvement is needed to maintain our high quality of life by reducing congestion and improving safety along this Major Arterial Roadway.

Expenditures	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	Total
Design/Planning (Professional Services)				216,000							216,000
ROW and Easements					1,200,000						1,200,000
Construction Engineering / Inspection						324,000					324,000
Construction						2,700,000					2,700,000
Total				**216,000**	**1,200,000**	**3,024,000**					**4,440,000**

Funding Sources	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	Total
Road Impact Fees				216,000	1,200,000	2,721,400					4,137,400
Stormwater						135,000					135,000
Water Capacity						55,000					55,000
Wastewater Renewal						112,600					112,600
Total				**216,000**	**1,200,000**	**3,024,000**					**4,440,000**

Exhibit E
PG 5 of 5

ST16011 - Mallory/N Royal Oaks & Liberty Intersection

RESOLUTION 2016-61

A RESOLUTION FUNDING THE DESIGN, RIGHT-OF-WAY ACQUISITION AND CONSTRUCTION FOR THE MALLORY LANE, NORTH ROYAL OAKS BLVD AND LIBERTY PIKE INTERSECTION PROJECT.

WHEREAS, in August of 2016, the City's on-call traffic engineer, Volkert, Inc., submitted a joint transportation impact analysis that was funded by the City, McEwen Town Center PUD Subdivision, Mallory Green (Ranco Farms Subdivision) and Spring Creek Subdivision; and

WHEREAS, the McEwen Town Center PUD Subdivision, Mallory Green (Ranco Farms Subdivision) and Spring Creek Subdivision developments were included in the McEwen Interchange TIF District; and

WHEREAS, the intersection of Mallory Lane, North Royal Oaks Blvd and Liberty Pike was included in the FY2017-2026 CIP and was ranked by Staff as a 3 star priority project; and

WHEREAS, due to continued growth and development, significant intersection delays are anticipated at the intersection of Mallory Lane, North Royal Oaks Blvd and Liberty Pike under the no build option; and

WHEREAS, this project received 3 out of 9 votes during the Board of Mayor and Aldermen prioritization process and was ranked number 16; and

WHEREAS, the estimated design, construction and right-of-way cost for the project is $4,440,000.

NOW THEREFORE, BE IT RESOLVED by the Board of Mayor and Aldermen of the City of Franklin, Tennessee, that the intersection of Mallory Lane, North Royal Oaks Blvd and Liberty Pike shall be funded, using a combination of funding sources, as determined by the Board of Mayor and Aldermen and the project shall be included as part of the FY2017-2026 CIP.

IT IS SO RESOLVED AND DONE on this __ day of _____, 2016

ATTEST:

By:_____

ERIC S. STUCKEY
City Administrator

CITY OF FRANKLIN, TENNESSEE:

By:_____

DR. KEN MOORE
Mayor

Law Dept. approved 09.16.16

Approved as to Form:

By: _____
Shauna R. Billingsley
City Attorney

HISTORIC
FRANKLIN
TENNESSEE

MEMORANDUM

TO: Board of Mayor and Alderman

FROM: Eric Stuckey, City Administrator
Chris Bridgewater, Director, Building & Neighborhood Services
Kathleen L. Sauseda, Housing Development Coordinator

DATE: September 13, 2016

SUBJECT: Contract for Fair Housing Outreach using CDBG funds

Purpose

The purpose this memorandum is to provide information to the Board of Mayor and Aldermen (BOMA) to consider a sub-recipient agreement with Tennessee Fair Housing Council in the amount of $3,000.00 for providing Fair Housing Outreach as defined in the City of Franklin's Annual Action Plan using CDBG funds. The City has the option to renew this contract under the same terms and conditions for an additional twelve (12) months based on the availability of the CDBG funds.

Background

The City of Franklin has been identified affordable housing development as an important issue in the community. Part of affordable housing is ensuring all citizens are treated fairly and the city act to prohibit discrimination in all kinds of housing-related transactions, including rental and sales.

Financial Impact

This contract is fully funded by the Community Development Block Grant Program. The $3,000.00 will be disbursed from these funds in accordance with CDBG program guidelines.

Recommendation

Staff recommend approval of the contract to the Board of Mayor and Aldermen.

CONTRACT BETWEEN THE CITY OF FRANKLIN, TENNESSEE AND TENNESSEE FAIR HOUSING COUNCIL, INC. FOR THE FAIR HOUSING EDUCATION AND OUTREACH PROGRAM for 2016-2017
COF Contract No. 2016-0229

This Agreement (hereinafter "Agreement"), made and entered into this ___ day of _____, 2016 by and between the City of Franklin, (hereinafter "THE CITY") and the Tennessee Fair Housing Council, Inc. for the award of funding for the Fair Housing Education and Outreach Program.

WITNESSETH:

WHEREAS, the City is eligible for entitlement funds through the federal Community Development Block Grant ("CDBG") program; and

WHEREAS, the City desires to contract with the Tennessee Fair Housing Council, as a housing related non-profit organization, to provide Fair Housing Outreach within the City of Franklin; and

NOW, THEREFORE, in consideration of the mutual promises as contained herein, the parties hereto have agreed and hereby enter into this Agreement according to the provisions as set forth herein.

SECTION 1 - SCOPE OF SERVICES
Working under the direction of the Assistant City Administrator for Community Development or his designee:

The Tennessee Fair Housing Council shall undertake development of Fair Housing Outreach as set forth in Exhibit A, which is referenced as if fully incorporated herein.

SECTION 2 - RESPONSIBILITIES OF PARTIES

A. The Tennessee Fair Housing Council will perform the duties described above and take any actions necessary to accomplish the spirit of this Agreement.

B. The Tennessee Fair Housing Council will carry out activities necessary to guide any associated public meetings and notices relative to the counseling program.

C. The Tennessee Fair Housing Council will submit regular reports (no less than quarterly) as directed by the City detailing the progress of their project.

D. THE CITY will provide funding for the program from the CDBG program as set forth in Section 3 of this contract.

SECTION 3 – COMPENSATION

The Tennessee Fair Housing Council will receive up to **Three Thousand and 00/100 Dollars ($3,000.00)** for the services outlined herein from the Community Development Block Grant program for eligible expenses.

SECTION 4 - TIME OF PERFORMANCE

A. Services shall be performed upon contract award through June 30, 2017.

B. The City has the option to renew this contract under the same terms and conditions for an additional twelve (12) months based on the availability of CDBG funds, which runs from July 1, 2016 through June 30, 2017. Both parties shall agree to this extension in writing.

C. This Agreement may be terminated upon thirty (30) days written notice by either party.

SECTION 5 - PAYMENT TERMS AND CONDITIONS

THE CITY shall reimburse the Tennessee Fair Housing Council for services rendered based on submittal of valid invoices for project costs with a description and documentation of work performed. THE CITY has the option of inspecting the completed work prior to making any payments.

A. Invoices shall be submitted monthly including back up documentation for services rendered.

B. Final payment will be subject to receipt of a final report that is satisfactory to THE CITY.

SECTION 6 - NOTICES

All notices under this Agreement shall be in writing and sent by certified mail to the address listed below for each party.

Kathleen L. Sauseda	**Tracey McCartney, Executive Director**
Housing Development Coordinator	**Tennessee Fair Housing Council**
109 3rd Avenue South	**107 Music City Circle, Suite 318**
Franklin, TN 37064	**Nashville, TN 37214**

SECTION 7 - STANDARD TERMS AND CONDITIONS

A. COMPLIANCE WITH FEDERAL LAWS/REGULATIONS

The Tennessee Fair Housing Council shall comply with all applicable Federal and State laws and regulations in the performance of this Agreement.

B. ANTIDISCRIMINATION/AFFIRMATIVE ACTION AND EQUAL EMPLOYMENT OPPORTUNITY

1. No person on the grounds of handicap, age, race, color, religion, sex, national origin, disability, or marital/familial status or any other classification protected by Federal and/or State of Tennessee constitutional and/or statutory law-shall be excluded from participation in, or be denied benefits or, or be otherwise subjected to discrimination in the performance of this Contract.

2. The Tennessee Fair Housing Council agrees to add section B, paragraph 1 to all contracts relative to this Contract and shall require their contractors to add the same paragraph in all sub-contracts relative to this Contract.

C. AUDIT REQUIREMENTS

1. This Agreement, as well as any sub-agreement made with other participating agencies, is subject to all of the administrative requirements in OMB Circulars A-110 and A-122.

2. THE CITY hereby notifies the Tennessee Fair Housing Council that a single audit is required for non-profit agencies receiving $500,000 or more in federal funds in any single fiscal year. This requirement is in accordance with OMB Circulars A-110 and A-133. If required, a copy of the single audit report will be kept on file and made available to the City staff during sub-recipient monitoring visits and appropriate officials as requested.

D. CONFLICT OF INTEREST

The Tennessee Fair Housing Council agrees to abide by the following requirements with respect to conflicts of interest, and covenants that it presently has no interest, direct or indirect, and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of services required under this Agreement. The Tennessee Fair Housing Council further covenants that in the performance of this Agreement no person having such an interest, direct or indirect, shall be employed or retained by the Tennessee Fair Housing Council hereunder. These conflict of interest provisions apply to any person who is an employee, agent, consultant, officer, or elected official or appointed official of the Tennessee Fair Housing Council or of any designated public agencies or sub-recipients that are receiving funds under this program.

E. PROCUREMENT STANDARDS AND METHODS

The Tennessee Fair Housing Council shall comply with THE CITY's current policy concerning the purchase of equipment and shall maintain inventory records of all non-expendable personal property as defined by such policy as may be procured with funds herein.

The Tennessee Fair Housing Council shall procure all materials, property, or services in accordance with the requirements of Attachment O of OMB Circular A-110, Procurement Standards.

F. CHOICE OF LAW; VENUE

This Agreement is made under and will be construed in accordance with the laws of the State of Tennessee without giving effect to that state's choice of law rules. In the event of a dispute of litigation arising out of this Agreement, it is understood and agreed that this Agreement was executed and performed in Williamson County, Tennessee, and as such, it is agreed by both parties that the forum and venue for said litigation, including an action for Declaratory Judgment, shall be exclusively in the courts of Williamson County, Tennessee.

G. ASSIGNMENT

Neither THE CITY nor the Tennessee Fair Housing Council may assign its rights or delegate its responsibilities under this contract.

H. ENTIRE CONTRACT AND MODIFICATION

The Agreement between the parties and supersedes any prior or contemporaneous communications, representations or agreements between the parties, whether oral or written, regarding the subject matter of the entire Agreement. The terms and conditions of this Agreement may not be changed except by an amendment expressly referencing this Agreement by section number and signed by an authorized representative of each party.

If seeking any addition or modification to the Agreement, the parties agree to reference the specific paragraph number sought to be changed on any future document or purchase order issued in furtherance of the Agreement, however, an omission of the reference to same shall not affect its applicability. In no event shall either party be bound by any terms contained in any purchase order, acknowledgement, or other writings unless: (a) such purchase order, acknowledgement, or other writings specifically refer to the Agreement or to the specific clause they are intended to modify; (b) clearly indicate the intention of both parties to override and modify the Agreement; and (c) such purchase order, acknowledgement, or other writings are signed, with specific material clauses separately initialed, by authorized representatives of both parties.

I. SEVERABILITY

If any provision of this Agreement is held invalid, the remainder of the Agreement shall not be affected thereby and all other parts of this Agreement shall nevertheless be in full force and effect.

J. TIME OF THE ESSENCE

The parties agree that TIME IS OF THE ESSENCE with respect to the parties' performance of all provisions of the Agreement.

K. NO TAXES, NO INTEREST PAYMENTS

As a tax-exempt entity, THE CITY shall not be responsible for sales or use taxes incurred for products or services. THE CITY shall supply the Tennessee Fair Housing Council with its Sales and Use Tax Exemption Certificate upon the Tennessee Fair Housing Council's request. The Tennessee Fair Housing Council shall bear the burden of providing its suppliers with a copy of THE CITY's tax exemption certificate and shall assume all liability for such taxes, if any, that should be incurred. THE CITY does not agree to pay any interest for late payments, having agreed to pay in a timely manner.

L. WAIVER

Neither party's failure nor delay to exercise any of its rights or powers under the Agreement will constitute or be deemed a waiver or forfeiture of those rights or powers. For a waiver of a right or power to be effective, it must be in writing signed by the waiving party. An effective waiver of a right or power shall not be construed as either (a) a future or continuing waiver of that same right or power, or (b) the waiver of any other right or power.

M. BREACH

Upon deliberate breach of the Agreement by either party, the non-breaching party shall be entitled to terminate the Agreement without notice, with all of the remedies it would have in the event of termination, and may also have such other remedies as it may be entitled to in law or in equity.

N. NO ATTORNEY-CLIENT RELATIONSHIP

By providing fair housing services to THE CITY, the Tennessee Fair Housing Council is not acting as THE CITY's attorney, and no attorney-client relationship has been or will be formed between the Tennessee Fair Housing Council and THE CITY or any of its employees or elected officials by virtue of these services.

No information provided during training or other services shall be construed as legal advice.

No communication that takes place during training of officials and/or employees of THE CITY shall be protected by attorney-client privilege. However, the Tennessee Fair Housing Council agrees that it will not use any communication received during training of officials and/or employees of THE CITY as the basis for any fair housing enforcement action.

THE CITY agrees to waive any claim of conflict of interest arising from the fair housing services the Council may be asked to provide.

WITNESS our hands on the date as entered above.

CITY OF FRANKLIN, TENNESSEE

By: _____ **Date:** _____
Dr. Ken Moore, Mayor

Attest:

_____ **Date:** _____
Eric S. Stuckey City Administrator

Approved as to Form:

_____
Kristen L. Corn, Assistant City Attorney

TENNESSEE FAIR HOUSING COUNCIL

_____ **Date:** _Aug. 3, 2016__ _____
Authorized Signature
Tennessee Fair Housing Council

Tennessee Fair Housing Council
Proposed Scope of Services
Exhibit A

The Tennessee Fair Housing Council, when awarded funds under this proposal, will undertake the following services:

Fair Housing Counseling, Representation and Outreach

A. Direct client service

The Tennessee Fair Housing Council proposes to carry out fair housing counseling for residents of Franklin. The counseling will consist of the following:

- Providing general educational information to individuals to inform them of their rights in conjunction with the Fair Housing Laws, landlord-tenant laws and availability of housing in Franklin.
- Working with the Franklin Housing Authority to meet with Residents' Council members and residents of public housing in Franklin.
- Speaking with aggrieved individuals to inform them of their rights pertaining to Fair Housing, landlord-tenant laws and availability of housing in Franklin.
- Interacting with a potentially aggrieved individual's housing provider to determine the housing provider's version of the facts (i.e., investigation.)
- Interacting with a housing provider to inform the housing provider of his or her obligations under applicable law, in order to bring relief to the aggrieved individual.
- Providing legal representation to an aggrieved individual, either as a defendant or plaintiff in housing-related litigation.
- Speaking with and acting on behalf of individuals facing loss of Section 8 or public housing

We will coordinate closely with Legal Aid and local housing counseling agencies to make them aware of these services and to avoid duplication of efforts. We do not propose to provide the same services they do; for example, we would not provide first-time homebuyer training or assistance except perhaps to advise callers briefly of their rights under the Fair Housing Act before referring them to a HUD-certified housing counseling agency. The same would likely be true of foreclosure prevention cases, unless we received a case that was clearly discrimination.

In order to avoid even the appearance of conflict or "double-dipping" with our current FHIP grant, the Council will use existing internal controls for billing the appropriate funding source for service to a complainant. Our internal guidelines and controls will provide that aggrieved individuals who appear to have a bona fide housing discrimination case may initially start out as a client under this CDBG project but will then be transitioned to the FHIP grant for fair housing services.

However, complainants who either 1) do not articulate a bona fide housing discrimination complaint, or 2) articulate a discrimination complaint that is not supported by the law or facts – but may represent a violation of other laws – will be served solely under this contract.

We will **speak with** and counsel any individual who contacts us for assistance with rental housing, on issues from security deposits to eviction to locating safe, decent and affordable housing. However, more active involvement from the Council, such as contacting the landlord or representing the complainant in court, will be reserved for more serious housing violations that can and/or do make safe, decent and affordable housing unavailable.

Examples of complaints in which the Council would offer active intervention:

- Tenants facing unjustified evictions (including from public housing) alleging violations of the lease that clearly did not occur
- Tenants experiencing unsafe or unsanitary living conditions, through no fault of their own, because of the landlord's deliberate failure to meet his or her obligations under the Uniform Residential Landlord and Tenant Act or local occupancy codes
- Tenants who are being subjected to "illegal ouster" (otherwise known as "self-help eviction") through lockout, unjustified termination of utilities, removal or theft of belongings or other means
- Tenants experiencing landlords' unlawful entry into a rental property without notice
- Tenants facing homelessness or unsafe conditions because of fire or casualty damage
- Retaliatory conduct following a good-faith complaint to Codes or some other agency

The Council already fields upwards of 50 calls a month (most from Davidson County) that it is unable to address through its current FHIP grant because they do not involve a fair housing issue. Many of them would be appropriate for handling under this contract. There is an existing demand for counseling on matters such as those articulated above.

For these calls, we would do an intake as we do with fair housing calls, evaluate the caller's needs for counseling and/or more active intervention, assess whether the caller's complaint should be handled under this project or our FHIP project and then proceed accordingly. We will track those clients just as we do our FHIP clients; our client database allows us to report on clients under individual grants.

Our **goal** would be to serve at least 15 clients under this project; however, client activity from Franklin under our HUD grants traditionally has been very low. We hope that our outreach efforts (discussed below) would help us to meet or surpass this goal.

B. Outreach in public housing

The Council will work with the Franklin Housing Authority Residents Council to provide outreach to public housing residents and, possibly, the larger community. The Residents Council has already contacted us about the possibility of holding a training for the Council board or the larger community of FHA residents.

C. Tennessee Fair Housing Matters Conference

The Tennessee Fair Housing Matters Conference is a major conference on fair housing held during Fair Housing Month; this agency has been involved in the conference for at least 12 years and has been the primary sponsor/planner for the last six years. We plan to work with several agencies again, including the City of Franklin, to plan and hold the conference in April 2017.[1] At this time, Franklin is the tentative host city for the event.

In recent years, the conference has had about 185 attendees, including housing professionals, housing advocates, governmental employees and policy makers. The conference helps to raise awareness of fair housing issues among attendees, many of whom are real estate and rental agents who can play a role in curbing residential segregation and other forms of housing discrimination. The financial resources provided by our several partners in this effort help us to keep registration fees low so that more people are able to attend.

The agenda generally includes three major general sessions, including two speeches by major national figures, and three concurrent breakout tracks in the afternoon, including a "Fair Housing/Landlord-Tenant 101" track. The conference has attracted as speakers some of the country's most knowledgeable experts, such as Bryan Greene and Sara Pratt from HUD, Vicky Schultz from the U.S. Department of Justice and Michael Allen from D.C. law firm Relman and Dane, one of the architects of the groundbreaking Westchester case on affirmatively furthering fair housing. Based on our experience, we expect at least 130 attendees at this event.

Internal systems to begin this project within 30 days of notification of contract award. The Tennessee Fair Housing Council is ready and able to begin this project immediately. Accounting properly for our time on this project is already possible in our accounting software. We already have the expertise needed to perform the substantive activities under this task.

Outreach methodologies to the community. In order to make the general public aware of our housing counseling/mediation/representation services, we will, as outlined above, work with the Franklin Housing Authority and participate in public service announcements on fair housing which may include interviews and/or news stories about fair housing issues.

Outline of proposed expenses. The following is an estimate of our charges on this project:

Mileage: 5 trips from office location to Franklin x 60 miles round trip x 54.5 cents per mile = $163.50
Postage, printing of materials = $200
TOTAL = $363.50

The Council will submit invoices supporting expenses and timesheets for its time on the project.

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[1] We do not propose to invoice the City of Franklin for all our time spent organizing this event; this event has several funders and partners.

RESOLUTION 2016-53

TO BE ENTITLED: "A RESOLUTION TO RECLASSIFY AN ADMINISTRATIVE ASSISTANT (NON-SWORN) POSITION TO A POLICE OFFICER (SWORN) POSITION."

WHEREAS, The Police Department is requesting to reclassify an unfilled clerical position to create another sworn Police Officer position; and

WHEREAS, The increased demands on the Police Department would make this additional Officer position a better use of budgeted positions, for example: an increased number of calls for service in the business district and neighborhoods, special events in the parks and downtown area. This newly hired Officer would be assigned to uniformed Patrol; and

WHEREAS, The newly created position can be absorbed within the current budget due to the fact a fourth Administrative Assistant position would be converted to an entry level Police Officer position. Considering the salary of the Administrative Assistant who previously held this position, this would be a cost savings; and

NOW THEREFORE, BE IT RESOLVED, BY THE BOARD OF MAYOR AND ALDERMEN OF THE CITY OF FRANKLIN, TENNESSEE, The Board of Mayor and Aldermen ("BOMA") hereby approve the reclassification of an Administrative Assistant (non-sworn) position to a Police Officer (sworn) position within the Police Department. Further, BOMA adopts the attached revised Organizational Chart and revised Staffing Position document and incorporates them into the Fiscal Year Budget 2016-2017, pages 105 and 106.

IT IS SO RESOLVED AND DONE on this ____ day of _____ 2016.

ATTEST:

By:_____
Eric S. Stuckey
City Administrator

CITY OF FRANKLIN, TENNESSEE:

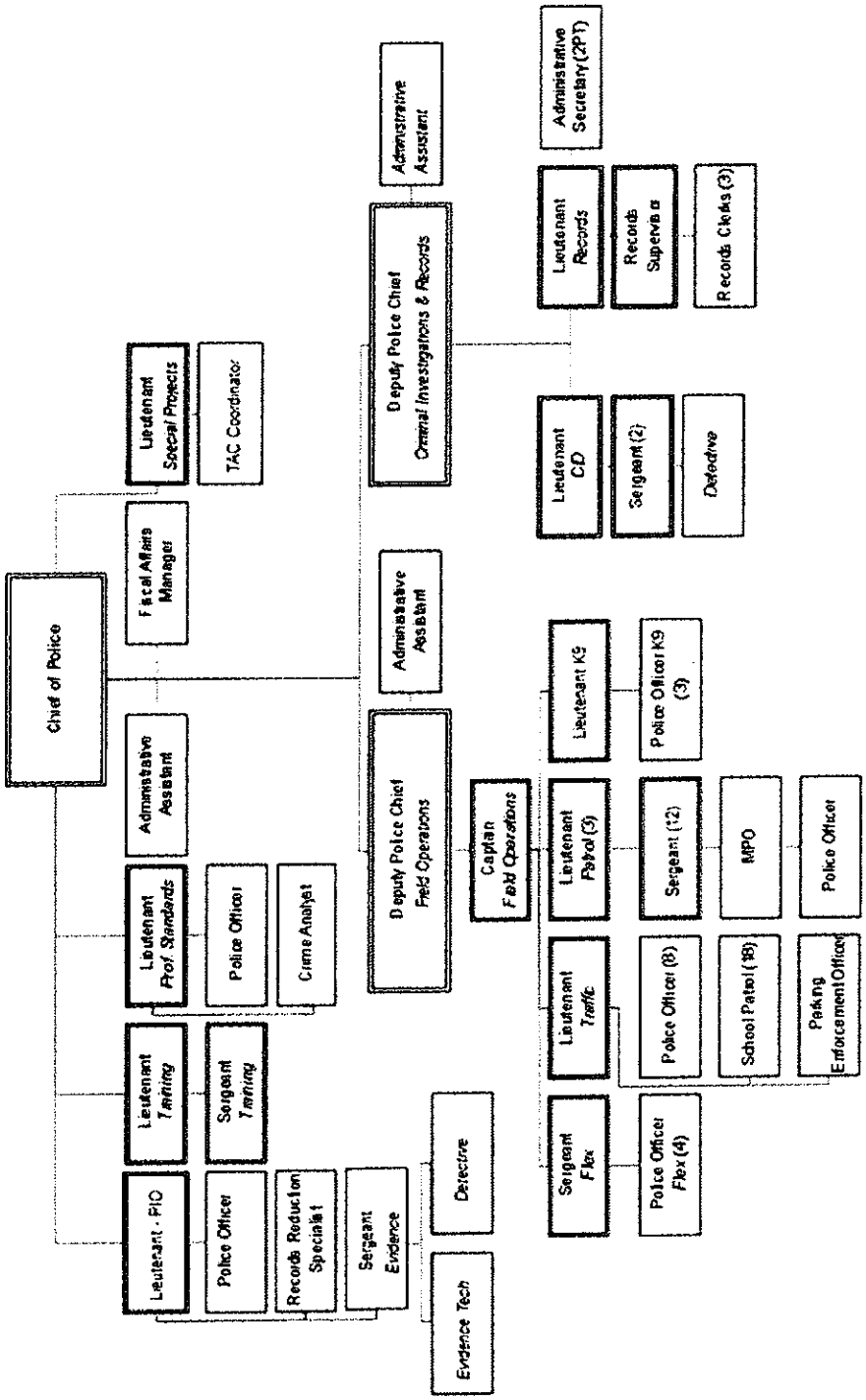
By:_____
DR. KEN MOORE
Mayor

Approved as to form by:

_____
Shauna R. Billingsley
City Attorney

Law Dept. approved 8.31.16

Organizational Chart



Staffing by Position

Position	Pay Grade	FY 2013		FY 2014		FY 2015		FY 2016		FY 2017	
		F-T	P-T	F-T	P-T	F-T	P-T	F-T	P-T	F-T	P-T
Sworn Officers											
Police Chief	Grade M	1	0	1	0	1	0	1	0	1	0
Police Deputy Chief	Grade K	3	0	3	0	2	0	2	0	2	0
Field Operations Captain	Grade J	0	0	0	0	0	0	1	0	1	0
Police Lieutenants	Grade I	7	0	9	0	9	0	10	0	10	0
Police Sergeant	Grade G	21	0	20	0	20	0	18	0	18	0
Detective/Master Patrol	Grade F	16	0	15	0	27	0	27	0	27	0
Police Officers	Grade E	81	0	80	0	68	0	68	0	70	0
Police Officer (R&D)	Grade E	1	0	1	0	1	0	1	0	0	0
Admin & Communications											
Fiscal Affairs Manager	Grade H	0	0	0	0	1	0	1	0	1	0
Asst. Comm. Super.*	Grade E	1	0	1	0	1	0	1	0	0	0
Records Supervisor	Grade E	1	0	1	0	1	0	1	0	1	0
Sr. Communications Officer*	Grade E	3	0	3	0	3	0	3	0	0	0
Admin. Asst.	Grade D	4	0	4	0	4	0	4	0	3	0
Comm. Center Support Coord.	Grade D	1	0	1	0	1	0	1	0	1	0
Evidence Technician	Grade D	1	0	1	0	1	0	1	0	1	0
Communications Officer*	Grade D	12	0	12	0	12	0	12	0	0	0
Administrative Secretary	Grade B	0	2	0	2	0	2	0	2	0	2
Records Clerk	Grade B	3	0	3	0	3	0	3	0	3	0
Parking Enforcement officer	Grade B	1	0	1	0	1	0	1	0	1	0
School Patrol (Part-time)	Grade A	0	18	0	18	0	11	0	11	0	11
Crime Analyst	TBD	0	0	0	0	0	0	0	0	1	0
Records Reduction Specialist	TBD	0	0	0	0	0	0	1	0	1	0
Total Authorized Staffing		**157**	**20**	**156**	**20**	**156**	**13**	**157**	**13**	**142**	**13**

Positions by Division

Administration	N/A Breakout between Divisions begins FY 2015	8	0	9	0	15	0
Patrol		88	11	88	11	97	11
CID		60	2	60	2	30	2
Total Authorized Staffing		**156**	**13**	**157**	**13**	**142**	**13**

**Effective FY 2017, all but one Communications employee is now assigned to Williamson County EMA. City provides for salary costs of 14 employees, but nothing else.*

C17-0084

AGREEMENT BETWEEN
MIDDLE TENNESSEE STATE UNIVERSITY
AND
THE CITY OF FRANKLIN, TENNESSEE

COF CONTRACT NO. 2016-0096

This Agreement is made this 25th day of May 2016, by and between Middle Tennessee State University, hereinafter referred to as the "Institution," and the City of Franklin, Tennessee, hereinafter referred to as "Contractor."

WITNESSETH:

In consideration of the mutual promises herein contained, the parties have agreed and do hereby enter into this Agreement according to the provisions set out herein:

A. The Contractor agrees to perform the following services:

1. Research, write. locate images, and fabricate ten (10) interpretive markers for the Carter's Hill battlefield site, which will document nationally significant events from both the Civil War and Reconstruction. The markers will include (an estimated) three (3) on the topic of the cotton gin and slavery; four (4) on the battle; one (1) on the influence of topography on the battle; one (1) on the Columbia Pike as a historic roadway, and one (1) on post-war events and sharecropping.

2. Provide the Tennessee Civil War National Heritage Area (TCWNHA) with text and images for the signage and other outdoor interpretive elements to review before they are created.

3. Include the TCWNHA logo in the exhibit and recognize the TCWNHA as a sponsor of this exhibit.

4. Include the TCWNHA logo and give appropriate credit to the TCWNHA for its contributions to this project in all signage, media, publications, and events associated with this project.

5. Submit an invoice with receipts, match report with receipts, and brief final report to the TCWNHA.

B. The Institution agrees to compensate the Contractor as follows:

1. A total of not to exceed Thirty-five Thousand and NO/100 Dollars ($35,000.00).

2. Payment will be made in one payment of up to Thirty-five Thousand and NO/100 Dollars ($35,000.00) upon submission of an invoice, match report, receipts, and brief final report from the Contractor, to the TCWNHA.

3. Payments to the Contractor shall be made according to the schedule set out above, provided that payments shall be made only upon submittal of invoices by the Contractor, and after performance of the portion of the services which the invoiced amount represents. The final payment shall be made only after the Contractor has completely performed its duties under this Agreement.

The Contractor shall not be compensated/reimbursed for travel expenses.

Law Dept. approved 05.09.16

C. The parties further agree that the following shall be essential terms and conditions of this Agreement.

1. The Contractor warrants that no part of the total contract amount provided herein shall be paid directly or indirectly to any officer or employee of the state of Tennessee as wages, compensation, or gifts in exchange for acting as officer, agent, employee, sub-Contractor, or consultant to the Contractor in connection with any work contemplated or performed relative to this Agreement.

2. The Contractor shall abide by all applicable Federal and State law pertaining to discrimination and hereby agrees, warrants, and assures that no person shall be excluded from participation in, be denied benefits of, or otherwise be subjected to discrimination in the performance of this Agreement or in the employment practices of the Contractor on the grounds of classifications protected by Federal or State law.

3. Middle Tennessee State University is committed to providing accessible information, materials and technologies to assure that individuals with disabilities have access to university resources comparable to access that is available to others.

4. If Contractor will receive Federal funds under this Agreement, Contractor agrees to complete a TBR Annual Title VI Survey or cooperate with a TBR Title VI compliance audit.

5. This Agreement is made under and will be construed in accordance with the laws of the State of Tennessee. Any provision of this Agreement held to violate a law or regulation shall be deemed void, and all remaining provisions shall continue in force.

6. The term of this Agreement shall be from May 25, 2016, to September 30, 2016.

7. This Agreement may be terminated by either party by giving written notice to the other, at least (thirty) 30 days before the effective date of termination. In that event, the Contractor shall be entitled to receive just and equitable compensation for any satisfactory authorized work completed as of the termination date.

8. If the Contractor fails to fulfill in a timely and proper manner its obligations under this Agreement, or if the Contractor shall violate any of the terms of this Agreement, the Institution shall have the right to immediately terminate this Agreement and withhold payments in excess of fair compensation for work completed.

9. This Agreement may be modified only by written amendment executed by all parties hereto.

10. The Contractor shall maintain documentation for all charges against the Institution under this Agreement. The books, records, and documents of the Contractor, insofar as they relate to work performed or money received under this Agreement, shall be maintained for a period of three (3) full years from the date of the final payment, and shall be subject to audit, at any reasonable time and upon notice, by the Institution or the Comptroller of the Treasury, or their duly appointed representatives.

11. The Contractor shall not assign this Agreement or enter into sub-contracts for any of the work described herein without obtaining the prior written approval of the Institution or Tennessee Board of Regents, as appropriate. Approval shall not be given if the proposed subcontractor was or is currently ineligible to bid on the Agreement.

12. The Contractor shall submit to the Institution quarterly progress reports if requested by the Institution.

13. This Agreement shall be governed by and construed pursuant to the laws of the State of Tennessee. Any and all claims against Institution arising under this Agreement shall be submitted to the Claims Commission of the State of Tennessee in the manner prescribed by law. Damages recoverable against Institution shall be limited expressly to claims paid by the Claims Commission pursuant to Tennessee Code Annotated (T.C.A.) § 9-8-301, et seq.

14. This Agreement shall not be binding upon the parties until it is approved by the president or designee or the Tennessee Board of Regents, as appropriate.

15. PCI DSS Compliance. If the Contractor will accept credit or debit cards in its performance under this Agreement, Contractor agrees that it will at all times during the performance of this Agreement comply with current Payment Card Industry Data Security Standards (PCI-DSS standards).

16. Illegal Immigrants. By acceptance of this Agreement, Contractor is attesting that it will not knowingly utilize the services of illegal immigrants and will not knowingly utilize the services of any subcontractor that does so in performance of this Agreement. If Contractor is discovered to have breached this attestation, Contractor shall be prohibited from supplying goods and/or services to any TBR institution or other state entity for a period of one (1) year from the date of discovery of the breach. Contractor may appeal the one (1) year by utilizing the established appeals process.

17. The Contractor shall be registered with the Tennessee Department of Revenue for the collection of Tennessee sales and use tax **and** must provide a copy of its certificate of registration to Institution. This registration requirement is a material requirement of this Agreement.

    However, nothing in this section shall require the Contractor to register if the Contractor does not make sales to customers in Tennessee of taxable goods or services. If the Contractor does not make sales to customers in Tennessee of taxable goods or services and marks **Not Applicable** below, its authorized signature on this Agreement shall serve as certification of compliance with this requirement.

    Mark as appropriate below:

    Certificate provided _____ **OR** **Not applicable** ✓

C17-0084

In witness whereof, the parties have by their duly authorized representatives set their signatures.

City of Franklin, Tennessee

BY: _____

TITLE: Mayor

DATE: 7-12-16

Approved as to form by:

_____

Kristen L. Corn
Assistant City Attorney

Middle Tennessee State University

BY: _____

TITLE: Alan R. Thomas
Interim Vice President, Business & Finance

DATE: 7/29/2016

Law Dept. approved 05.09.16

Amendment 1 to Agreement
between
The City of Franklin, Tennessee
and
Middle Tennessee State University
COF Contract No. 2016-0096

This Amendment to the Agreement ("Agreement"), MTSU Contract Number C17-0084, and City of Franklin Contract No. 2016-0096, between the City of Franklin, Tennessee ("Contractor") and Middle Tennessee State University ("Institution") shall be effective on the date this Amendment is fully executed by both parties.

The Agreement shall be amended as follows:

C. 6. The term of this Agreement shall be from May 25, 2016, to December 31, 2016.

Except as specifically provided herein, all other terms and conditions of the Agreement remain unchanged and are hereby ratified and affirmed.

City of Franklin, Tennessee

By: _____

Name: Dr. Ken Moore

Title: Mayor

Date: _____

Middle Tennessee State University

By: _____

Name: Alan R. Thomas

Title: Vice President, Business & Finance

Date: _____

Approved as to form by:

_____

Kristen L. Corn, Assistant City Attorney

HISTORIC
FRANKLIN
TENNESSEE

Debt Capacity Model Update

Presented on
August 18, 2016

The PFM Group
Financial & Investment Advisors

PFM Financial Advisors LLC
530 Oak Court Drive
Memphis, TN 38117-3722
P 901.682.8356
F 901.682.8386

Capacity Model Overview

The Capacity Model includes:

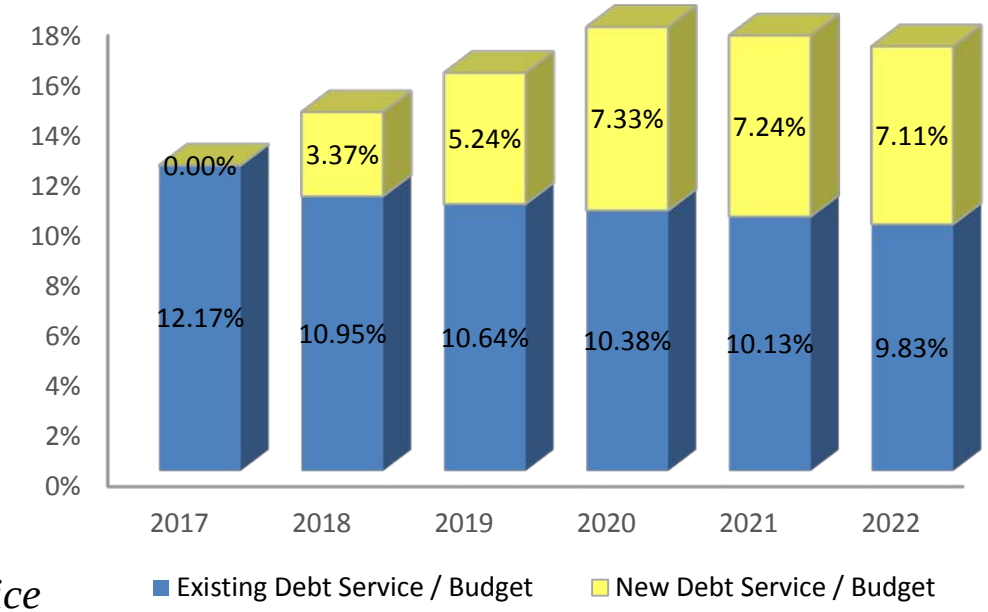
- Actual, Audited Revenues and Expenditures for FY 2015
- Estimated, Unaudited FY 2016 Revenues and Expenditures
- Budgeted FY 2017 Revenues and Expenditures
- Revenue and Expenditure Growth Rate Assumptions for FY 2018 – 2022 provided by the City
- Bonds issued in FY 2017, FY 2019 and FY 2021 to cover CIP project needs of $82.3 million which results in bonds issued totaling $63.8 million

CIP Summary

Projects	Project Description	2017	2018	2019	2020	2021	2022	5 Year Total (18-22)	Project Total
	CIP Work Sheet								
	August 2016 Analysis								
1	East McEwen Drive - Phase 4	2,600,000	1,000,000	12,164,000	12,164,400	-	-	25,328,400	27,928,400
	Net Funding Needs	2,350,000	750,000	7,914,000	7,914,400	-	-	16,578,400	18,928,400
2	East/Southeast Multipurpose Park	1,200,000	4,000,000	4,000,000	4,000,000	-	-	12,000,000	13,200,000
	Net Funding Needs	-	3,800,000	3,800,000	3,800,000	-	-	11,400,000	11,400,000
3	Sidewalk Gaps	250,000	250,000	250,000	250,000	250,000	-	1,000,000	1,250,000
	Net Funding Needs	250,000	250,000	250,000	250,000	250,000	-	1,000,000	1,250,000
4	Fire Station 7	80,000	4,150,000	100,000	-	-	-	4,250,000	4,330,000
	Net Funding Needs	-	-	-	-	-	-	-	-
5	Franklin Road Improvements & Streetscape	-	2,550,000	5,895,000	5,895,000	-	-	14,340,000	14,340,000
	Net Funding Needs	-	1,900,000	4,405,450	5,155,450	-	-	11,460,900	11,460,900
6	Goose Creek Interchange Lighting	60,000	810,000	-	-	-	-	810,000	870,000
	Net Funding Needs	30,000	405,000	-	-	-	-	405,000	435,000
7	Major Street Resurfacing	-	2,400,000	-	1,700,000	-	1,300,000	5,400,000	5,400,000
	Net Funding Needs	-	2,400,000	-	1,700,000	-	1,300,000	5,400,000	5,400,000
8	Hillsboro Road	15,000,000						-	15,000,000
	Net Funding Needs	15,000,000	-	-	-	-	-	-	15,000,000
Project Subtotal		19,190,000	15,160,000	22,409,000	24,009,400	250,000	1,300,000	63,128,400	82,318,400
Net Funding Needs		17,630,000	9,505,000	16,369,450	18,819,850	250,000	1,300,000	46,244,300	63,874,300
	Bonds Issued	27,135,000		35,189,300		1,550,000			63,874,300

Debt Service to Budget Metrics

	2017	2018	2019	2020	2021	2022
New Debt Service	-	2,177,383	3,492,094	5,001,063	5,058,973	5,125,439
Estimated Gen Fund Budget (GF Revenues)	62,851,566	64,679,768	66,609,758	68,217,387	69,909,525	72,111,789
New Debt Service / Budget	0.00%	3.37%	5.24%	7.33%	7.24%	7.11%
Existing Debt Service	7,651,190	7,079,596	7,084,969	7,080,820	7,085,047	7,086,321
Existing Debt Service / Budget	12.17%	10.95%	10.64%	10.38%	10.13%	9.83%
New + Existing Debt Service	7,651,190	9,256,978	10,577,063	12,081,883	12,144,019	12,211,760
New + Existing Debt Service / Budget	12.17%	14.32%	15.88%	17.71%	17.37%	16.94%



Debt Assumptions:
Interest rate of 5.00%
20 year, level debt service

Debt Management Policy Ratios

The City's updated Debt Management Policy includes the following ratios:

1. Direct debt as a % of Full Value $\leq$ 1.75%
2. Direct debt of Operating Revenues of $\leq$ 3.00X
3. Total Governmental Funds Debt Service as a % of expenditures $\leq$ 25%

The City also has a reserve fund policy to maintain at least 33% of General Fund Revenues.

Policy Ratios

	Affordability Matrix				
	Direct Debt % of Full Value	Direct Debt to Operating Revenue	Govt. Fund DS % Govt. Expenditures	General Fund Balance as a % of Operating Revenues(1)	Debt Service as a % of Operating Expenditures(2)
Debt Policy	**≤ 1.75%**	**≤ 3.00x**	**≤ 25%**	**≥ 30%**	
FY 2017 (Series 2017 Bonds)	1.3%	2.4	14.9%	61.9%	10.8%
FY 2018	1.2%	2.2	16.2%	62.8%	12.8%
FY 2019 (Series 2019 Bonds)	1.4%	2.5	17.4%	64.5%	14.1%
FY 2020	1.3%	2.3	19.0%	66.7%	15.5%
FY 2021 (Series 2021 Bonds)	1.2%	2.1	18.9%	69.3%	15.3%
FY 2022	1.1%	2.0	18.3%	72.2%	15.1%

(1) Moody's 2013 Aaa Median = 38.5%
(2) This metric is no longer reported by Moody's.

Assumptions:
Market Value/Full Value grows at 1%
Governmental Expenditures grow at 1%
Operating Expenses include debt service to be paid out of the General Fund

City of Franklin

FY 2017-2026 Capital Improvement Program Financing Model

Presentation to the Board of Mayor and Alderman
September 13, 2016

Capital Financing Model - September 13, 2016

Executive Summary

This financing model has been built to determine answers to the following questions:

- What is the amount of available resources from all funds which can be spent on Capital Projects over the next ten years?
- How much will Phase I of the FY 2017-2026 Capital Improvement Program cost?
- What will be the amount of remaining resources after those projects are paid for? And,
- What will be the impact on the City's debt capacity and overall debt service?

This model has three main sections:

- This Executive Summary with summaries of current, future and remaining resources, annual and cumulative cost estimates for all Phase I CIP projects and a revised Debt Capacity Analysis given the revised cost of projects.
- Phase I CIP Project Detail Sheets, which itemize the annual and cumulative funding needs by source by project.
- 10-year Financing Analysis with detailed forecasts for most major internal funds of the City of Franklin.

In building this model, staff has tried to be conservative with our revenue projections and prudent when determining available resources. "Available fund balances" are current estimated balances in most funds as of June 30th, less amounts reserved either through state law or BOMA policy.

The result is mostly positive - due to the prudent management of the community and the passage of the Invest Franklin initiative, the City can afford to take on all Phase I projects and have reasonable levels of remaining resources to fund additional phases of the FY 2017-2026 Capital Improvement Program.

Existing Resources (Cash)

The following shows the various funding sources currently available for use on Capital projects. While the City aggressively looks for outside funding to assist in stretching taxpayer dollars, the vast majority of resources available to the City are internal in nature.

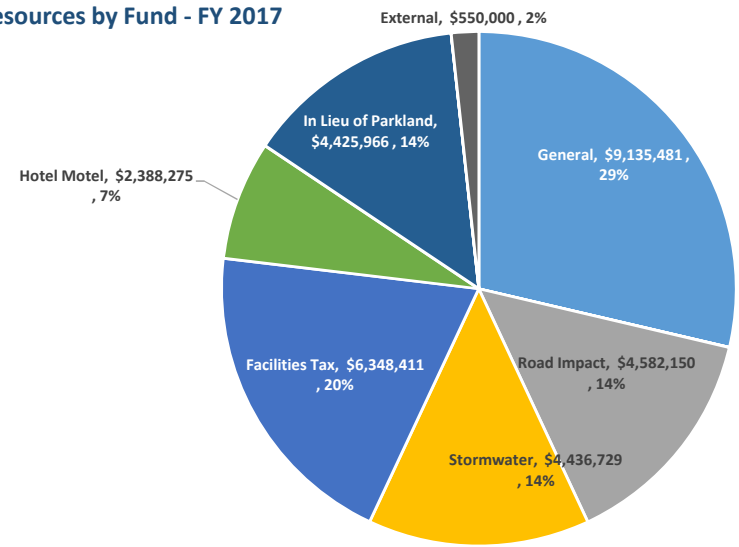
	FY 2015 Actual	FY 2016 Projected	FY 2017 Forecast
Internal			
110 General			
Capital Funding Account (<45%)	$ 8,347,536	$ 8,101,435	$ 8,101,435
1.5 Cent Capital Set-Aside	$ 508,038	$ 1,034,046	$ 1,714,782
Invest Franklin	$ -	$ -	$ 3,176,766
124 Sanitation Fund	$ -	$ -	$ 32,294
128 Road Impact Fund	$ 397,796	$ 4,582,150	$ 4,880,814
130 Stormwater	$ 4,783,235	$ 4,436,729	$ 4,658,995
135 Facilities Tax	$ 6,717,764	$ 6,348,411	$ 9,260,411
150 Hotel Motel	$ 2,749,596	$ 2,388,275	$ 3,269,693
155 In Lieu of Parkland	$ 2,494,076	$ 4,425,966	$ 5,633,491
421 Water 431 Sewer	$ -	$ -	$ 925,000
Sub-Total Internal Resources	$ 25,998,041	$ 31,317,012	$ 41,653,681
External			
MPO/TDOT	$ -	$ -	$ 8,630,000
Army Corp of Engineers	$ -	$ -	$ -
County Facilities Tax	$ 2,021,022	$ 3,262,263	$ 4,212,263
Utility Agreements	$ -	$ -	$ 475,000
Developer Contributions	$ 550,000	$ 550,000	$ 550,000
Sub-Total External Resources	**$ 2,571,022**	**$ 3,812,263**	**$ 13,867,263**
Total All Available Resources	**$ 28,569,063**	**$ 35,129,275**	**$ 55,520,944**

Projected Resources (Cash)

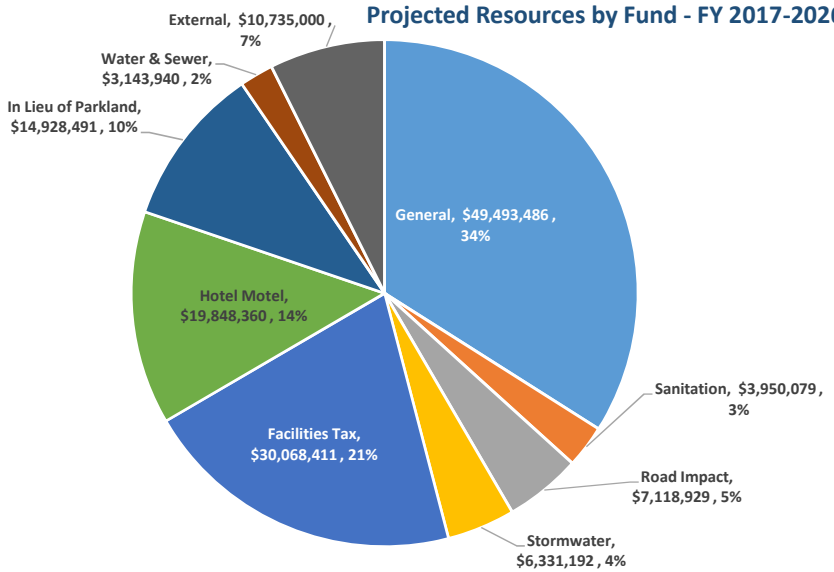
This summarizes the projected cash resources available to the City for the FY 2017-2026 Capital Improvement Program. Existing Fund Balance is shown at the far left, while annual anticipated revenue contributions are provided for the ten-year timeframe of the program. Available Debt Service, and the impact on available cash resources, are shown in the page entitled "Debt Capacity Analysis" on another summary. Detailed funding sheets for most internal funds are provided in the section entitled "10-year Financing Analysis" at the end of this packet.

	Fund Balance Available	Ongoing Resources										Total Available
		FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	
Internal												
General												
Capital Funding Account	$ 8,101,435	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,101,435
1.5 Cent Capital Set-Aside	$ 1,034,046	$ 680,736	$ 687,543	$ 694,419	$ 701,363	$ 708,377	$ 715,460	$ 722,615	$ 729,841	$ 737,140	$ 744,511	$ 8,156,051
Invest Franklin	$ -	$ 3,176,766	$ 3,208,534	$ 3,240,619	$ 3,273,025	$ 3,305,755	$ 3,338,813	$ 3,372,201	$ 3,405,923	$ 3,439,982	$ 3,474,382	$ 33,236,000
Sanitation Fund	$ -	$ 32,294	$ 244,165	$ 588,923	$ 556,343	$ 521,641	$ 484,723	$ 445,495	$ 403,857	$ 359,705	$ 312,933	$ 3,950,079
Road Impact Fund	$ 4,582,150	$ 298,664	$ 838,593	$ 111,484	$ 131,256	$ 153,639	$ 352,228	$ 372,842	$ 103,176	$ 76,783	$ 98,114	$ 7,118,929
Stormwater	$ 4,436,729	$ 222,266	$ 216,697	$ 210,537	$ 203,759	$ 196,328	$ 188,214	$ 179,373	$ 169,778	$ 159,377	$ 148,135	$ 6,331,192
Facilities Tax	$ 6,348,411	$ 2,912,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 30,068,411
Hotel Motel	$ 2,388,275	$ 881,418	$ 1,134,099	$ 1,139,140	$ 1,295,873	$ 1,458,643	$ 2,049,163	$ 2,401,230	$ 1,843,140	$ 2,547,764	$ 2,709,614	$ 19,848,360
In Lieu of Parkland	$ 4,425,966	$ 1,207,525	$ 1,255,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 14,928,491
Water Funding*	$ -	$ 552,500	$ 863,620	$ 311,120	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,727,240
Sewer Funding*		$ 372,500	$ 528,500	$ 156,000	$ 179,850	$ 179,850	$ -	$ -	$ -	$ -	$ -	$ 1,416,700
External												
MPO/TDOT	$ -	$ 8,630,000	$ 1,555,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 10,185,000
Army Corp of Engineers	$ -	$ -	$ -	$ 750,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 750,000
County Facilities Tax	$ 3,262,263	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 12,762,263
Utility Agreements	$ -	$ 475,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 475,000
Developer Agreements	$ 550,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 550,000
Total	$ 35,129,275	$ 20,391,669	$ 13,793,750	$ 11,469,242	$ 10,608,470	$ 10,791,232	$ 11,395,601	$ 11,760,756	$ 10,922,714	$ 11,587,751	$ 11,754,689	$ 159,605,150

Existing Resources by Fund - FY 2017



Projected Resources by Fund - FY 2017-2026



Year-By-Need Phase I Analysis

The following shows the annual need for Phase I capital projects by funding source. Detailed funding sheets by project are available later in this packet in the section entitled "Phase I CIP Projects". It is important to note that unlike previous schedules, a large amount of funding is requested to come from debt service. This is further explained under the sheet entitled "Debt Capacity Analysis".

	Ongoing Resources										Total
	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Needed
Internal											
General											
Cash	$ 580,000	$ 655,000	$ 250,000	$ 250,000	$ 250,000	$ -	$ -	$ -	$ -	$ -	$ 1,985,000
Debt	$ 7,025,000	$ 5,732,880	$ 8,955,630	$ 15,357,300	$ 11,034,550	$ -	$ -	$ -	$ -	$ -	$ 48,105,360
Sanitation Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Road Impact Fund	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ -	$ -	$ -	$ -	$ -	$ 1,250,000
Stormwater	$ 50,000	$ 50,000	$ 272,250	$ 272,250	$ -	$ -	$ -	$ -	$ -	$ -	$ 644,500
Facilities Tax	$ 225,000	$ 2,102,500	$ 3,552,500	$ 1,500,000	$ 1,500,000	$ -	$ -	$ -	$ -	$ -	$ 8,880,000
Hotel Motel	$ 195,000	$ 195,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 390,000
In Lieu of Parkland	$ -	$ 250,000	$ 600,000	$ 350,000	$ 350,000	$ -	$ -	$ -	$ -	$ -	$ 1,550,000
Water Funding	$ 552,500	$ 863,620	$ 311,120	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,727,240
Sewer Funding	$ 372,500	$ 528,500	$ 156,000	$ 179,850	$ 179,850	$ -	$ -	$ -	$ -	$ -	$ 1,416,700
External											
MPO/TDOT	$ 8,630,000	$ 1,555,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 10,185,000
Army Corp of Engineers	$ -	$ -	$ 750,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 750,000
County Facilities Tax	$ 500,000	$ 500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000,000
Utility Agreements	$ 475,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 475,000
Developer Agreements	$ -	$ 550,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 550,000
Total	**$ 18,855,000**	**$ 13,232,500**	**$ 15,097,500**	**$ 18,159,400**	**$ 13,564,400**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 78,908,800**

Remaining Resources

The following shows the anticipated balances in available funding at the end of the ten-year CIP horizon after the $78,908,800 worth of Phase I projects have been paid for.
It is important to note that the difference between the project respources shown on the page entitled "Projected (Cash) Resources" and this page is the conversion and estimation of available debt service capacity. Please see footnote 2 for more information.

	FY 2017-2026 Projected Resources	Phase I Project Needs	Balance Remaining
Internal			
110 General			
Pay-as-you-go Cash [1]	$ 16,257,486	$ 1,985,000	$ 14,272,486
Debt Service [2]	$ 80,000,000	$ 48,105,360	$ 31,894,640
124 Sanitation Fund	$ 3,950,079	$ -	$ 3,950,079
128 Road Impact Fund	$ 7,118,929	$ 1,250,000	$ 5,868,929
130 Stormwater	$ 6,331,192	$ 644,500	$ 5,686,692
135 Facilities Tax	$ 30,068,411	$ 8,880,000	$ 21,188,411
150 Hotel Motel	$ 19,848,360	$ 390,000	$ 19,458,360
155 In Lieu of Parkland	$ 14,928,491	$ 1,550,000	$ 13,378,491
421 Water	$ 1,727,240	$ 1,727,240	$ -
431 Sewer	$ 1,416,700	$ 1,416,700	$ -
External			
MPO/TDOT	$ 10,185,000	$ 10,185,000	$ -
Army Corp of Engineers	$ 750,000	$ 750,000	$ -
County Facilities Tax	$ 12,762,263	$ 1,000,000	$ 11,762,263
Utility Agreements	$ 475,000	$ 475,000	$ -
Developer Contributions	$ 550,000	$ 550,000	$ -
Total	**$ 206,369,150**	**$ 78,908,800**	**$ 127,460,350**

Notes:

[1] Pay as you go cash includes the balance of the Capital Funding Account (over 45% of fund balance in the General Fund) and the accumulated total of the 1.5 Cent property tax allocation for capital projects.

[2] Debt Service resource is an estimated amount of $80,000,000 based upon the amount of capacity gained from the amount of existing debt service to be retired and the addition of the $0.07 of property tax from the **Invest** *Franklin* initative.

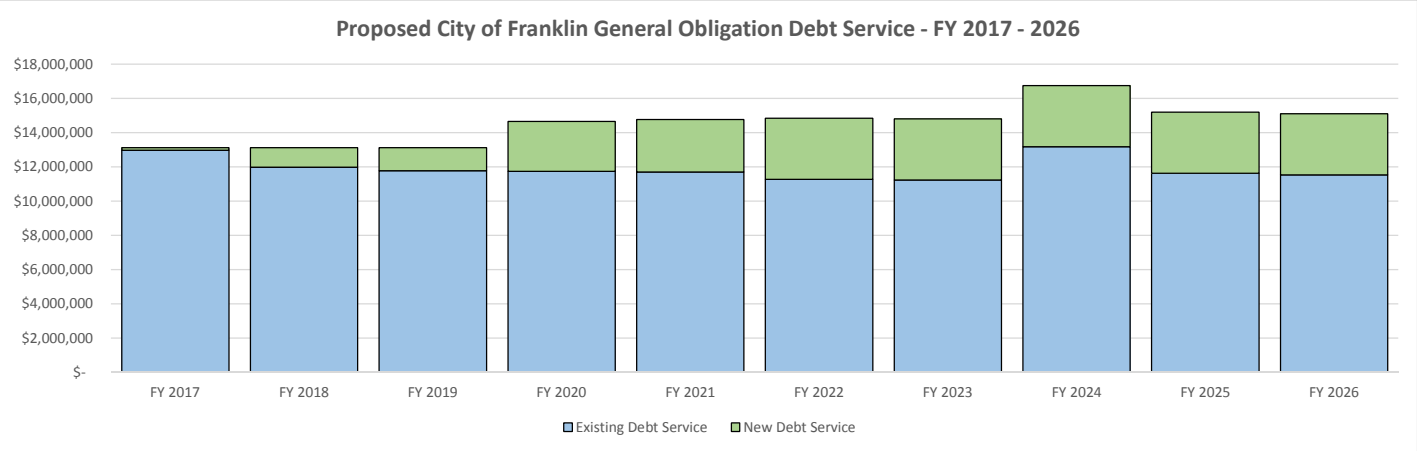
Debt Capacity Analysis

Proposed Debt Issuances				FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Balance (FY 2027-FY 2042)
2017	4.50%	$	15,000,000	$ 150,000	$ 1,141,875	$ 1,141,875	$ 1,141,875	$ 1,141,875	$ 1,141,875	$ 1,141,875	$ 1,141,875	$ 1,141,875	$ 1,141,875	$ 12,560,625
2019	4.50%	$	25,000,000			$ 200,000	$ 1,775,313	$ 1,775,313	$ 1,775,313	$ 1,775,313	$ 1,775,313	$ 1,775,313	$ 1,775,313	$ 23,079,063
2021	4.50%	$	10,000,000					$ 150,000	$ 654,500	$ 654,500	$ 654,500	$ 654,500	$ 654,500	$ 9,817,500
A			**New Debt Service**	**$ 150,000**	**$ 1,141,875**	**$ 1,341,875**	**$ 2,917,188**	**$ 3,067,188**	**$ 3,571,688**	**$ 3,571,688**	**$ 3,571,688**	**$ 3,571,688**	**$ 3,571,688**	**$ 45,457,188**
B			**Existing Debt Service**	**$ 12,966,453**	**$ 11,975,848**	**$ 11,772,869**	**$ 11,735,204**	**$ 11,705,707**	**$ 11,273,302**	**$ 11,236,584**	**$ 13,173,630**	**$ 11,623,560**	**$ 11,534,574**	**$ 58,044,000**
C (A + B)			**Cumulative G.O. Debt Service**	**$ 13,116,453**	**$ 13,117,723**	**$ 13,114,744**	**$ 14,652,392**	**$ 14,772,895**	**$ 14,844,990**	**$ 14,808,272**	**$ 16,745,318**	**$ 15,195,248**	**$ 15,106,262**	**$ 103,501,188**

Summary:

A key financing component to the FY 2017-2026 Capital Improvement Plan is the issuance of debt. In order to finance Phase I of the CIP, staff is recommending the issuance of $50,000,000 worth of General Obligation (G.O.) bonds in three separate issuances for a duration of 20 years. The assumed interest rate is 4.5%.

The three issuances - one in FY 2017, FY 2019, and FY 2021 will fund East McEwen Phase 4, Franklin Road, Hillsboro Road Phase II, and the East/Southeast Park. The impacts on the overall debt service are shown above and to the right.



Debt Funding Analysis

How the debt is issued is dependent upon many factors; but none more important than the ability to pay. The chart below shows the annual increase in debt service necessary to service the proposed $50,000,000 in new bonds (Row D). Row E shows the available resources predicted to be generated annually from the $0.07 Invest Franklin initiative approved this spring by the BOMA. Row F is the difference on an annual basis. As the chart shows, sufficient capacity exists through the increase in revenues generated by Invest Franklin to accommodate the servicing of the proposed new debt. As important, the entire proposed level of resources is not exhausted by FY 2026, the end of the current CIP horizon. This means that additional resources are available for pay as you go financing and/or additional debt service for Phase II CIP projects.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
D **et Increase Debt Service Year over Year**	**$ 150,000**	**$ 1,270**	**$ (1,709)**	**$ 1,535,939**	**$ 1,656,442**	**$ 1,728,537**	**$ 1,691,819**	**$ 3,628,865**	**$ 2,078,795**	**$ 1,989,809**
E **Invest *Franklin***	**$ 3,176,766**	**$ 3,208,534**	**$ 3,240,619**	**$ 3,273,025**	**$ 3,305,755**	**$ 3,338,813**	**$ 3,372,201**	**$ 3,405,923**	**$ 3,439,982**	**$ 3,474,382**
F (E-D) **Annual Balance of Invest *Franklin* Funds**	**$ 3,026,766**	**$ 3,207,264**	**$ 3,242,328**	**$ 1,737,087**	**$ 1,649,314**	**$ 1,610,276**	**$ 1,680,383**	**$ (222,941)**	**$ 1,361,188**	**$ 1,484,574**
Cumulative Net Balance Invest *Franklin*	**$ 3,026,766**	**$ 6,234,029**	**$ 9,476,357**	**$ 11,213,444**	**$ 12,862,758**	**$ 14,473,034**	**$ 16,153,417**	**$ 15,930,475**	**$ 17,291,663**	**$ 18,776,237**

Phase I CIP Projects

Phase I CIP: East McEwen Drive - Phase 4

Improvement of East McEwen Drive, from 800 feet east of the roundabout at Cool Springs Boulevard/Oxford Glen Drive to Wilson Pike (SR-252). The project shall be constructed as a four (4) lane, median divided facility with turn lanes as required. Project shall include: access management (as allowable), curb & gutter, street lights, ITS Infrastructure, and accommodations for pedestrians and bicycles. Approximate project length of 8,200 LF. The budget has been updated based on additional time and cost associated with accepting federal funds in the amount of $8,000,000.

East McEwen Drive - Phase 4	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Total Available
Internal											
General	$ -	$ 2,350,000	$ 750,000	$ 7,384,550	$ 7,384,550	$ -	$ -	$ -	$ -	$ -	$ 17,869,100
Sanitation Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Road Impact Fund	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ -	$ -	$ -	$ -	$ -	$ 1,250,000
Stormwater	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hotel Motel	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
In Lieu of Parkland	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sewer Funding	$ -	$ -	$ -	$ 179,850	$ 179,850	$ -	$ -	$ -	$ -	$ -	$ 359,700
External											
MPO/TDOT	$ -	$ -	$ -	$ 4,000,000	$ 4,000,000	$ -	$ -	$ -	$ -	$ -	$ 8,000,000
County Facilities Tax			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Developer Agreements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total	**$ 250,000**	**$ 2,600,000**	**$ 1,000,000**	**$ 11,814,400**	**$ 11,814,400**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 27,478,800**

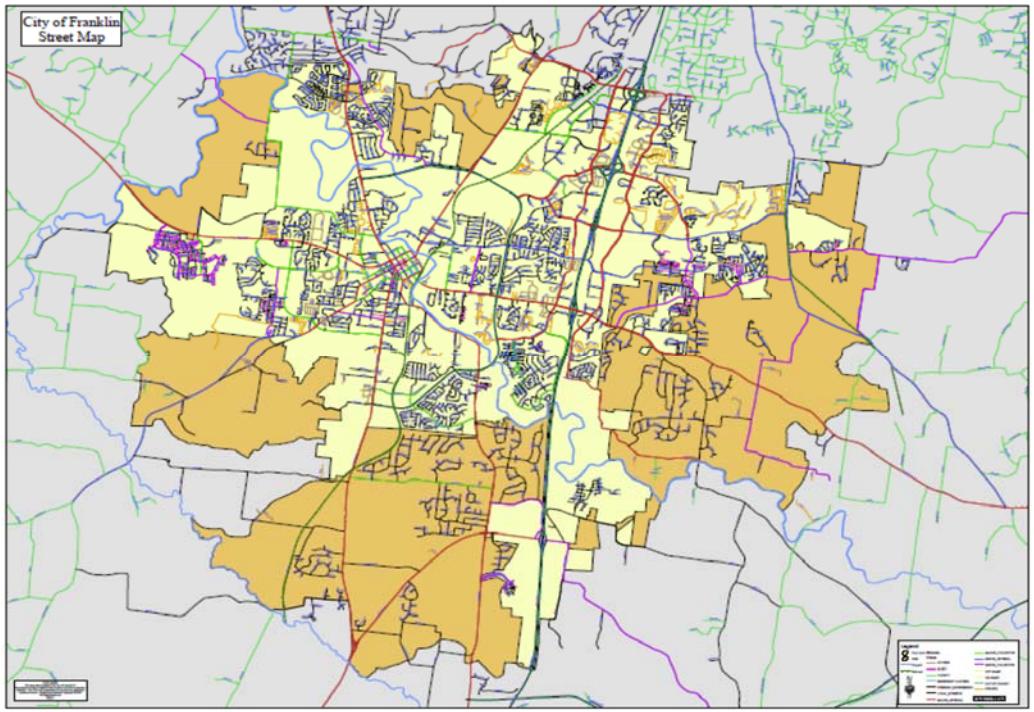
Phase I CIP: East / South East Multipurpose Park

New Southeast Multi-Purpose Park on the city-owned 180-acre parcel). The park would include a minimum of 8 lighted multi-purpose rectangular sports fields that could be used for football, lacrosse, rugby and soccer. The Franklin Cowboys football program would move from Jim Warren Park to this new park when completed. This park should have a range of passive uses as well to serve as a Community Park for neighborhoods in this area. A master plan should be developed for the park to guide phased development of the park.

East/Southeast Park	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Total Available
Internal											
General	$ 300,000	$ -	$ 2,100,000	$ 2,350,000	$ 2,350,000	$ -	$ -	$ -	$ -	$ -	$ 7,100,000
Sanitation Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Road Impact Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Stormwater	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities Tax	$ -	$ 50,000	$ 1,500,000	$ 1,500,000	$ 1,500,000	$ -	$ -	$ -	$ -	$ -	$ 4,550,000
Hotel Motel	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
In Lieu of Parkland	$ -	$ 250,000	$ 600,000	$ 350,000	$ 350,000	$ -	$ -	$ -	$ -	$ -	$ 1,550,000
Water Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sewer Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
External											
MPO/TDOT	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
County Facilities Tax			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Developer Agreements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total	$ 300,000	$ 300,000	$ 4,200,000	$ 4,200,000	$ 4,200,000	$ -	$ -	$ -	$ -	$ -	$ 13,200,000

Phase I CIP: Sidewalk Gaps

Annual budget of $250,000 over a 5-year period to "fill in" gaps in the existing sidewalk network. Segments of sidewalk that do not have logical connections exist in many areas around the City. A dedicated budget item on an annual basis would allow the City the opportunity to complete existing sidewalk networks by "filling-in" these gaps.



Sidewalk Gaps	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Total Available
Internal											
General	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ -	$ -	$ -	$ -	$ -	$ 1,250,000
Sanitation Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Road Impact Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Stormwater	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hotel Motel	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
In Lieu of Parkland	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sewer Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
External											
MPO/TDOT	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
County Facilities Tax			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Developer Agreements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ -	$ -	$ -	$ -	$ -	$ 1,250,000

Phase I CIP: Fire Station 7

The City currently operates a temporary fire station at the Williamson County AG Complex. This temporary fire station needs to be replaced with a permanent facility.

Fire Station 7	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Total Available
Internal											
General	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sanitation Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Road Impact Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Stormwater	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities Tax	$ 225,000	$ 2,052,500	$ 2,052,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,330,000
Hotel Motel	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
In Lieu of Parkland	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sewer Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
External											
MPO/TDOT	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
County Facilities Tax			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Developer Agreements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total	**$ 225,000**	**$ 2,052,500**	**$ 2,052,500**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 4,330,000**

Phase I CIP: Franklin Road Improvements

Improvement of Franklin Road, from the bridge at the Harpeth River to Hooper Lane. The project shall be constructed as a three (3) facility. Project shall include: curb & gutter, street lights, ITS Infrastructure, sidewalks, and typical streetscape elements. Approximate project length of 3,500 LF.

Franklin Road Improvements	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Total Available
Internal											
General	$ -	$ 1,532,880	$ 4,405,630	$ 5,622,750	$ -	$ -	$ -	$ -	$ -	$ -	$ 11,561,260
Sanitation Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Road Impact Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Stormwater	$ -	$ -	$ 272,250	$ 272,250	$ -	$ -	$ -	$ -	$ -	$ -	$ 544,500
Facilities Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hotel Motel	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
In Lieu of Parkland	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Funding	$ -	$ 311,120	$ 311,120	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 622,240
Sewer Funding	$ -	$ 156,000	$ 156,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 312,000
External											
MPO/TDOT	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
County Facilities Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Army Corps of Engineers	$ -	$ -	$ 750,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 750,000
Developer Agreements	$ -	$ 550,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 550,000
Total	**$ -**	**$ 2,550,000**	**$ 5,895,000**	**$ 5,895,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 14,340,000**

Phase I CIP: Goose Creek Interchange Lighting

Interchange Lighting for Goose Creek at I-65. The City will need to partner with TDOT to fund 50% of the cost associated with this project.

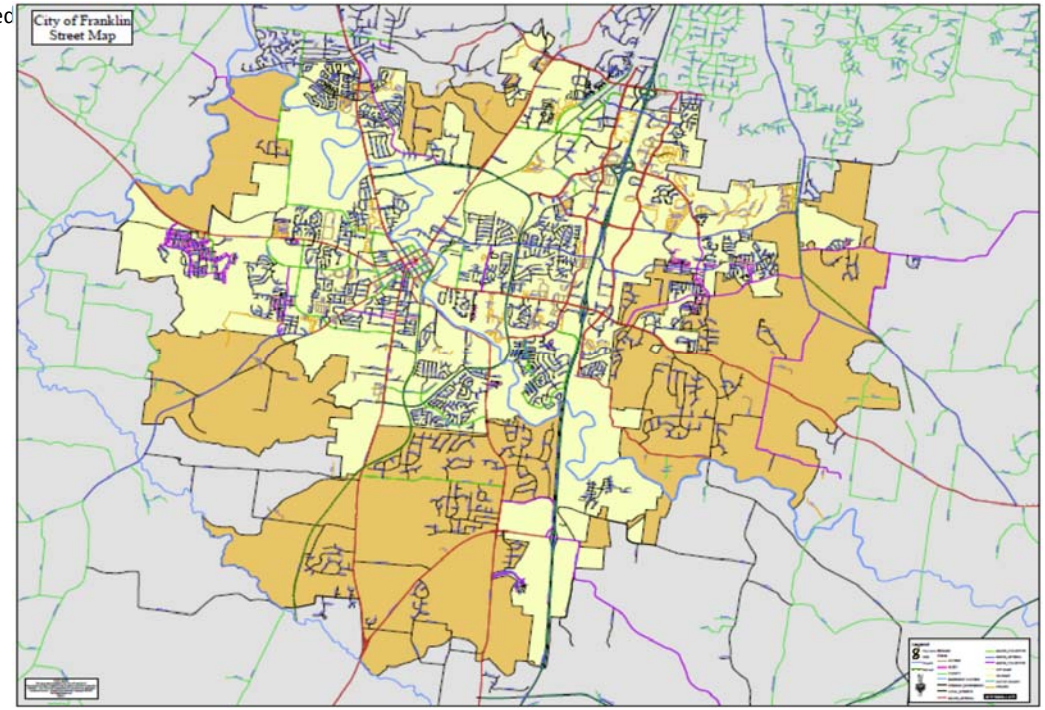
Goose Creek Lighting	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Total Available
Internal											
General	$ 30,000	$ 405,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 435,000
Sanitation Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Road Impact Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Stormwater	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hotel Motel	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
In Lieu of Parkland	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sewer Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
External											
MPO/TDOT	$ 30,000	$ 405,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 435,000
County Facilities Tax			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Developer Agreements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total	$ 60,000	$ 810,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 870,000

Phase I CIP: Major Street Resurfacing

The resurfacing (e.g. paving) of major roadways within the City are proposed to be included in the Capital Investment Plan (CIP) as follows:

2017 - Cool Springs Blvd, from Mack Hatcher Pkwy to East McEwen Dr.
2019 - Royal Oaks Blvd/Mallory Ln, from Mack Hatcher Pkwy to Cool Springs Blvd.
2021 - Mallory Ln, from Cool Springs Blvd to Moores Ln.

The list above is not final, and maybe subject to change.

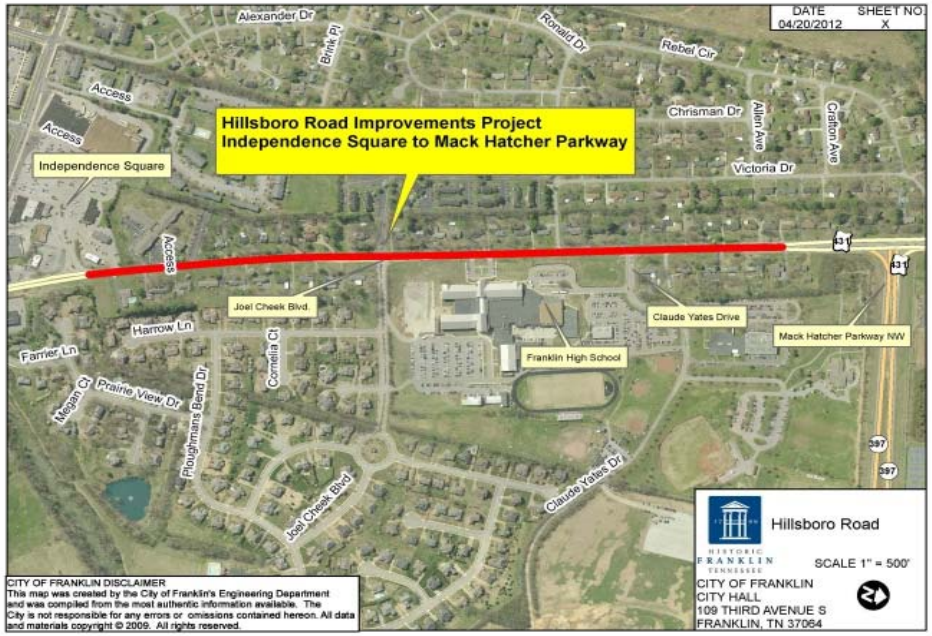


Major Street Resurfacing	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Total Available
Internal											
General	$ 2,400,000	$ -	$ 1,700,000	$ -	$ 1,300,000	$ -	$ -	$ -	$ -	$ -	$ 5,400,000
Sanitation Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Road Impact Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Stormwater	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hotel Motel	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
In Lieu of Parkland	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sewer Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
External											
MPO/TDOT	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
County Facilities Tax			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Developer Agreements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total	$ 2,400,000	$ -	$ 1,700,000	$ -	$ 1,300,000	$ -	$ -	$ -	$ -	$ -	$ 5,400,000

Phase I CIP: Hillsboro Road Phase II

This project is the second phase of the overall Hillsboro Road Improvements Project, creating roadway and utility infrastructure upgrades to Hillsboro Road, State Route 106. Aspects of this project include:

Widening from a 2-lane roadway with shoulders to 3-lanes (includes a new center turn lane) with curb and gutter (widening is symmetrical along the roadway's existing centerline); New 4.0' Bike lanes on both sides; New 3.0' grass strip with street trees; New 5.0' sidewalk along both sides of the roadway, up to Claude Yates; New street lighting along both sides using decorative street light poles; Northbound right turn lanes (in addition to the 2 travel lanes and center turn lane) to be added in front of Franklin High School and at both of the Joel Cheek Blvd. and Claude Yates Drive Intersections; Installing a traffic control signal at Claude Yates Drive to help with Franklin High School Traffic; Upgrading the Joel Cheek Blvd. traffic signal; Relocating all overhead utilities into underground duct banks; Upgrading older and undersized water and sanitary sewer utility lines; and Installing a new storm water sewer system with catch basins and yard inlets. These upgrades take place in both State Rights-of-Way and City/Public Easements.



Hillsboro Road Phase II	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Total Available
Internal											
General	$ 4,625,000	$ 1,850,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,475,000
Sanitation Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Road Impact Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Stormwater	$ 50,000	$ 50,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 100,000
Facilities Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hotel Motel	$ 195,000	$ 195,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 390,000
In Lieu of Parkland	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Funding	$ 552,500	$ 552,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,105,000
Sewer Funding	$ 372,500	$ 372,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 745,000
External											
Fed/MPO/TDOT	$ 600,000	$ 1,150,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,750,000
County Facilities Tax	$ 500,000	$ 500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000,000
Utility Agreements	$ 475,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 475,000
Developer Agreements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total	$ 7,370,000	$ 4,670,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,040,000

10-Year Financing Analysis

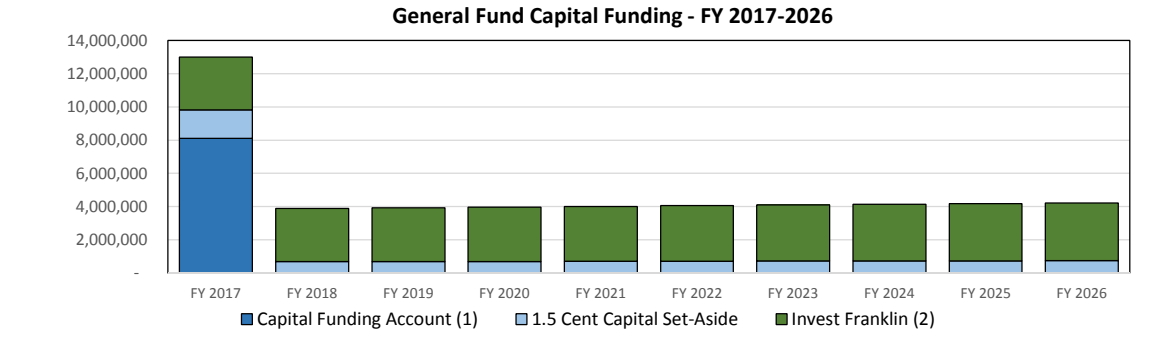
City of Franklin

FY 2017-2026 Capital Improvement Program Financing Model

DRAFT

Fund:	**General Fund**	**Percent of Total CIP Revenues**	**31.0%**

General Fund: The largest funding source for Capital Projects is the General Fund. The property tax contributes the most to capital resources within the General Fund (Both in the form of the Invest Franklin initiative and in FY 2025 when the bonds for the TIF district are paid off. It is anticipated that annual tax revenue will flow to the general fund for either operations and/or increased debt capacity. The amount of debt capacity is under review by the City's financial advisers and City staff.)



	Projections										Totals
	FY 2017	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	
Capital Funding Account [1]	8,101,435	-	-	-	-	-	-	-	-	-	**8,101,435**
1.5 Cent Capital Set-Aside	1,714,782	687,543	694,419	701,363	708,377	715,460	722,615	729,841	737,140	744,511	**8,156,051**
Invest *Franklin* [2]	3,176,766	3,208,534	3,240,619	3,273,025	3,305,755	3,338,813	3,372,201	3,405,923	3,439,982	3,474,382	**33,236,000**
Totals	**$ 12,992,983**	**$ 3,896,077**	**$ 3,935,038**	**$ 3,974,388**	**$ 4,014,132**	**$ 4,054,273**	**$ 4,094,816**	**$ 4,135,764**	**$ 4,177,122**	**$ 4,218,893**	**$ 49,493,486**

Assumptions

(1) Balance of Capital Funding Account (that portion of G.F. Reserves over 45% of fund balance) varies and will be finalized only once preliminary FY 2016 Audited Financials are available.

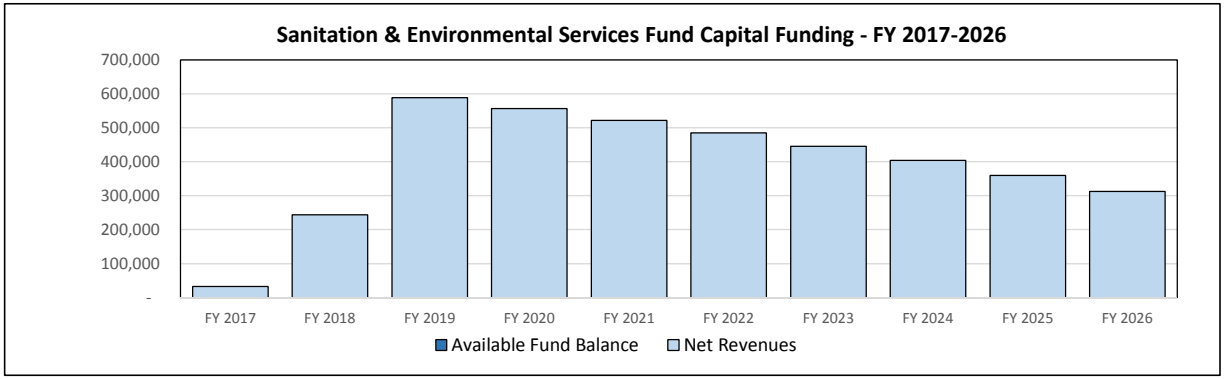
(2) Both the 1.5 Cent Capital Set Aside and the Invest Franklin receipts assume a conservative 1% growth year-over-year for the 10-year CIP horizon. Further increases may occur in FY 2022 at the time of the next revaluation of property, dependent upon what future BOMA's decide to do. For this analysis, no change in the rate is assumed.

(3) Available Balance will be finalized only once preliminary FY 2016 Audited Financials are available.

Fund:	Sanitation	Percent of All Revenues	2.5%

Sanitation & Environmental Services Fund: This Special Revenue fund accounts for the fees collected in the collection and disposal of residential and commercial garbage. The primary component within the fund are those fees charged for disposal of refuse. In recent years, the City has worked to reduce the subsidy from the General Fund for sanitation and recycling operations.

Beginning in FY 2018, the fund should be able to sustain without transfers from the General Fund, and will be able to be self-sustaining by FY 2019. This surplus should be reserved (at least in part) for Capital Renewal and Replacement. Given the growth of the community, another transfer station may be a real possibility.



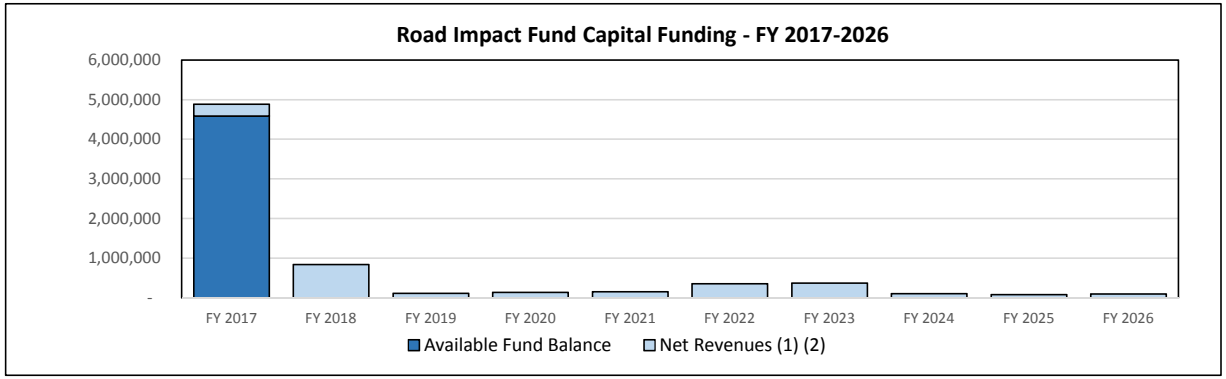
	Projections										Totals
	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	10-year
Available Fund Balance	-	-	-	-	-	-	-	-	-	-	-
Net Revenues	32,294	244,165	588,923	556,343	521,641	484,723	445,495	403,857	359,705	312,933	3,950,079
Totals	**$ 32,294**	**$ 244,165**	**$ 588,923**	**$ 556,343**	**$ 521,641**	**$ 484,723**	**$ 445,495**	**$ 403,857**	**$ 359,705**	**$ 312,933**	**$ 3,950,079**

(1) Available Balance will be finalized only once preliminary FY 2016 Audited Financials are available.

Fund:	Road Impact	Percent of All Revenues	4.5%

Road Impact Fund: The Road Impact Fund is the special revenue fund created for the accounting of expenditures in accord with City Ordinance 88-13 on the proceeds of road impact fees from new development. These funds can be used to pay for new arterial roads, directly or through payment of debt service on bonds associated with the projects.

The fund primarily is dedicated to servicing debt on already constructed arterial roadways. During the FY 2017-2026 CIP horizon, the debt service obligation assigned the Road Impact Fund is over $38 million. (And nearly $50 million total outstanding) Assuming the current balance is maintained as a sinking fund and reasonable collections remain to come into the fund, this obligation should be able to be met. But few - if any - new obligations should be planned at this time.



	Projections										Totals
	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	10-year
Available Fund Balance	4,582,150	-	-	-	-	-	-	-	-	-	4,582,150
Net Revenues (1) (2)	298,664	838,593	111,484	131,256	153,639	352,228	372,842	103,176	76,783	98,114	2,536,779
Totals	$ 4,880,814	$ 838,593	$ 111,484	$ 131,256	$ 153,639	$ 352,228	$ 372,842	$ 103,176	$ 76,783	$ 98,114	$ 7,118,929

(1) Net Revenues less Debt Service and possible offsets.
(2) Assumes average of $4,250,000 collected annually from FY 2017-FY 2026.
(3) Available Balance will be finalized only once preliminary FY 2016 Audited Financials are available.

City of Franklin

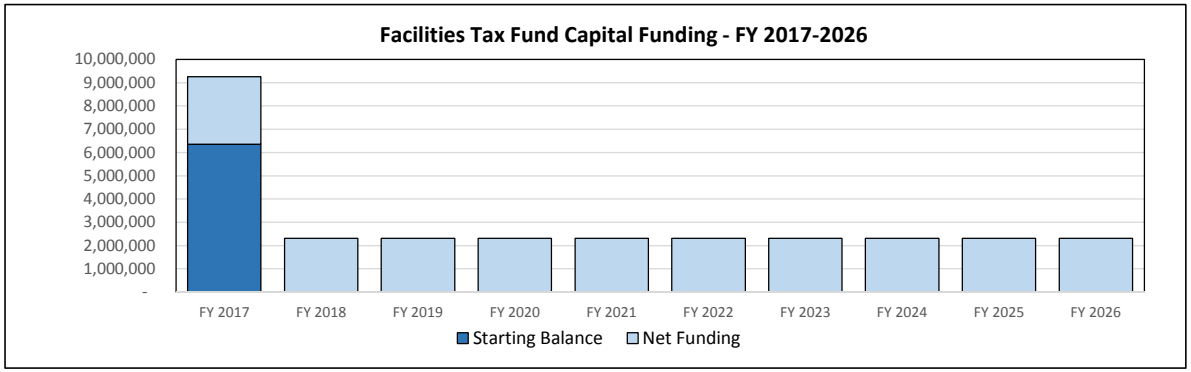
FY 2017-2026 Capital Improvement Program Financing Model

DRAFT

Fund:	Facilities Tax Fund	Percent of All Revenues	18.8%

Facilities Tax Fund: A special revenue fund used to account for the proceeds authorized by a private act of the Tennessee General Assembly of 1987 for the City to levy and collect a privilege tax on new development to provide that new development contribute its fair share of providing new public facilities made necessary by growth. Such taxes may be expended only upon police, fire, sanitation, and parks and recreation.

With the only known funding request against the fund any remaining costs of Fire Station 8 and Fire Station 7, (together both should be no more than $5,000,000), ample resources are available to spend from the Facilities Tax on eligible capital



	Projections										Totals
	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	10-Year
Starting Balance	6,348,411	-	-	-	-	-	-	-	-	-	6,348,411
Net Funding	2,912,000	2,312,000	2,312,000	2,312,000	2,312,000	2,312,000	2,312,000	2,312,000	2,312,000	2,312,000	23,720,000
Totals	**$ 9,260,411**	**$ 2,312,000**	**$ 2,312,000**	**$ 2,312,000**	**$ 2,312,000**	**$ 2,312,000**	**$ 2,312,000**	**$ 2,312,000**	**$ 2,312,000**	**$ 2,312,000**	**$ 30,068,411**

(1) Available Balance will be finalized only once preliminary FY 2016 Audited Financials are available.

City of Franklin

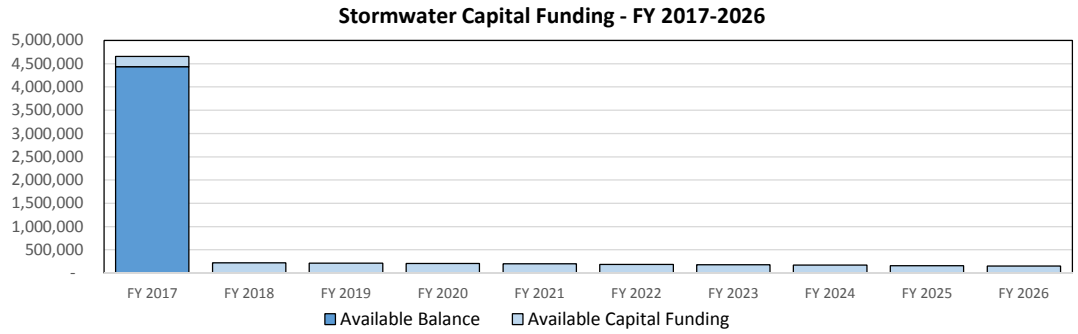
FY 2017-2026 Capital Improvement Program Financing Model

DRAFT

Fund:	Stormwater	Percent of Total CIP Revenues	4.0%

Stormwater Fund: A special revenue fund used to account for the City's Stormwater drainage projects and operations that prevent water issues. Revenues are primarily from charges to residential and commercial customers based on roofs and paved areas.

This is another fund dependent upon development. Should development increase faster than projected, or fees are increased, more money maybe come available for capital needs/requests. As it is, little annual surplus is forecast after operational concerns are met.



	Projections										Totals
	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	
Available Balance	4,436,729	-	-	-	-	-	-	-	-	-	4,436,729
Available Capital Funding	222,266	216,697	210,537	203,759	196,328	188,214	179,373	169,778	159,377	148,135	1,894,463
Totals	**$ 4,658,995**	**$ 216,697**	**$ 210,537**	**$ 203,759**	**$ 196,328**	**$ 188,214**	**$ 179,373**	**$ 169,778**	**$ 159,377**	**$ 148,135**	**$ 6,331,192**

Assumptions

(1) Available Balance will be finalized only once preliminary FY 2016 Audited Financials are available.

City of Franklin

FY 2017-2026 Capital Improvement Program Financing Model

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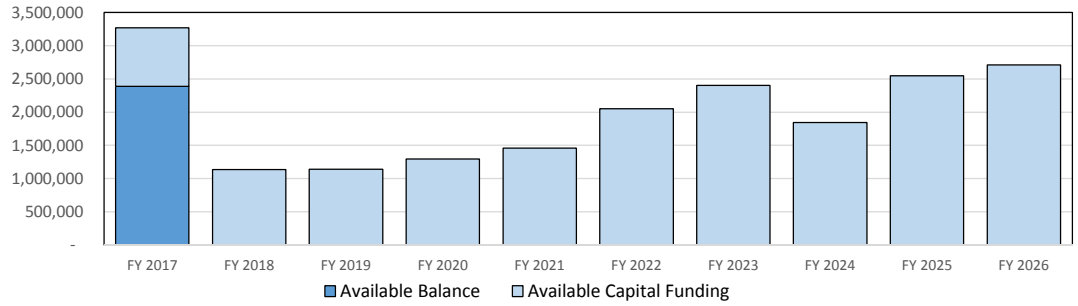
Fund:	Hotel Motel Tax	Percent of Total CIP Revenues	12.4%

Hotel Motel Tax: The Hotel/Motel Tax has been used in the past for those types of infrastructure projects which promote recreation and tourism. Specifically, these monies have been used for servicing debt related to the acquisition of the Carter's Hill Battlefield, Eastern Flank Battlefield and the Park at Harlinsdale Farm.

Future growth assumes between 4-5% growth in revenues from hotel stays annually, less all known costs (existing debt service and the City's contribution to the Williamson County Convention & Visitors Bureau).



	Projections										Totals
	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	
Available Balance	2,388,275	-	-	-	-	-	-	-	-	-	2,388,275
Available Capital Funding	881,418	1,134,099	1,139,140	1,295,873	1,458,643	2,049,163	2,401,230	1,843,140	2,547,764	2,709,614	17,460,085
Totals	**$ 3,269,693**	**$ 1,134,099**	**$ 1,139,140**	**$ 1,295,873**	**$ 1,458,643**	**$ 2,049,163**	**$ 2,401,230**	**$ 1,843,140**	**$ 2,547,764**	**$ 2,709,614**	**$ 19,848,360**

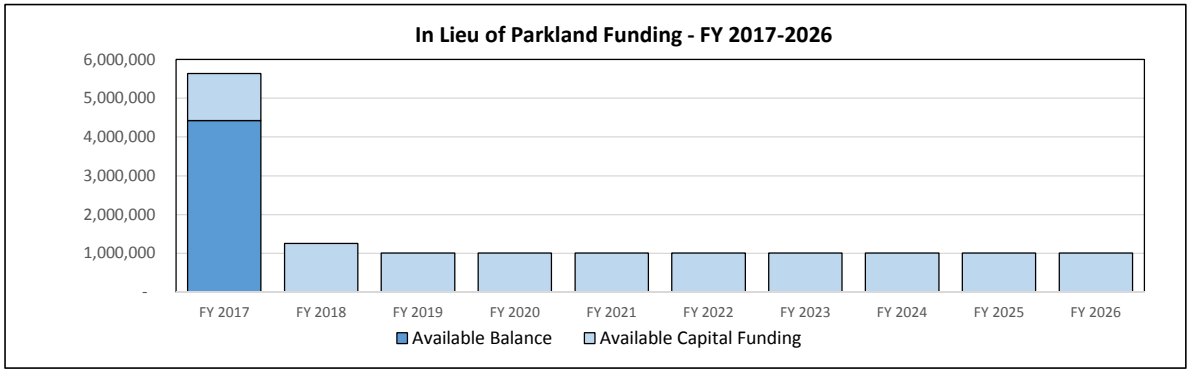
Assumptions

(1) Available Balance will be finalized only once preliminary FY 2016 Audited Financials are available.

Fund:	In Lieu of Tax Parkland	Percent of Total CIP Revenues	9.4%

In Lieu of Parkland Fund: The In Lieu of Parkland Fund was created in FY 2015 for the purpose of satisfying requirements of Section 5.5.4 of the City of Franklin Zoning Ordinance for developers seeking alternatives to the development of green space within developments. Funds can be used only for the acquisition or development of public parks, greenways/blue ways, open space sites, and related facilities.

The important issue of concern with these funds is the nexus issue: funds can only be spent in the quadrant of the community in which they are collected. Although funds are likely to be generated annually in excess of a million dollars, they cannot be spent City-wide. This limits how much can be spent on a particular project.



	Projections										Totals
	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	
Available Balance	4,425,966	-	-	-	-	-	-	-	-	-	4,425,966
Available Capital Funding	1,207,525	1,255,000	1,005,000	1,005,000	1,005,000	1,005,000	1,005,000	1,005,000	1,005,000	1,005,000	10,502,525
Totals	**$ 5,633,491**	**$ 1,255,000**	**$ 1,005,000**	**$ 1,005,000**	**$ 1,005,000**	**$ 1,005,000**	**$ 1,005,000**	**$ 1,005,000**	**$ 1,005,000**	**$ 1,005,000**	**$ 14,928,491**

Assumptions

(1) Available Balance will be finalized only once preliminary FY 2016 Audited Financials are available.

FY 2017-2026 Capital Investment Program Financing Model

September 13, 2016
Board of Mayor & Aldermen

Outline

- Executive Summary
- Available Resources
- Phase I Project Details
- Remaining Resources
- Debt Capacity Review

Executive Summary

This financing model has been built to determine answers to the following questions:

- What is the amount of available resources from all funds which can be spent on Capital Projects over the next ten years?
- How much will Phase I of the FY 2017-2026 Capital Improvement Program cost?
- What will be the amount of remaining resources after those projects are paid for? And,
- What will be the impact on the City's debt capacity and overall debt service?

Executive Summary

This model has three main sections:

- An Executive Summary with summaries of current, future and remaining resources, annual and cumulative cost estimates for all Phase I CIP projects and a revised Debt Capacity Analysis given the revised cost of projects.

- Phase I CIP Project Detail Sheets, which itemize the annual and cumulative funding needs by source by project.

- 10-year Financing Analysis with detailed forecasts for most major internal funds of the City of Franklin.

Executive Summary

In building this model, staff has tried to be conservative with our revenue projections and prudent when determining available resources. "Available fund balances" are current estimated balances in most funds as of June 30th, less amounts reserved either through state law or BOMA policy.

The result is mostly positive - due to the prudent management of the community and the passage of the Invest Franklin initiative, the City can afford to take on all Phase I projects and have reasonable levels of remaining resources to fund additional phases of the FY 2017-2026 Capital Improvement Program.

Available Resources

Taking into account all available fund balances which can be used for capital purposes and forecasting all future revenues for the next decade, *we project nearly $160,000,000 in cash (or over $206,000,000 in cash + debt)* is available for capital projects between now and the end of FY 2026.

Available Resources

	Fund Balance Available	Ongoing Resources										Total Available
		FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	
Internal												
General												
Capital Funding Account	$ 8,101,435	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,101,435
1.5 Cent Capital Set-Aside	$ 1,034,046	$ 680,736	$ 687,543	$ 694,419	$ 701,363	$ 708,377	$ 715,460	$ 722,615	$ 729,841	$ 737,140	$ 744,511	$ 8,156,051
Invest Franklin	$ -	$ 3,176,766	$ 3,208,534	$ 3,240,619	$ 3,273,025	$ 3,305,755	$ 3,338,813	$ 3,372,201	$ 3,405,923	$ 3,439,982	$ 3,474,382	$ 33,236,000
Sanitation Fund	$ -	$ 32,294	$ 244,165	$ 588,923	$ 556,343	$ 521,641	$ 484,723	$ 445,495	$ 403,857	$ 359,705	$ 312,933	$ 3,950,079
Road Impact Fund	$ 4,582,150	$ 298,664	$ 838,593	$ 111,484	$ 131,256	$ 153,639	$ 352,228	$ 372,842	$ 103,176	$ 76,783	$ 98,114	$ 7,118,929
Stormwater	$ 4,436,729	$ 222,266	$ 216,697	$ 210,537	$ 203,759	$ 196,328	$ 188,214	$ 179,373	$ 169,778	$ 159,377	$ 148,135	$ 6,331,192
Facilities Tax	$ 6,348,411	$ 2,912,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 2,312,000	$ 30,068,411
Hotel Motel	$ 2,388,275	$ 881,418	$ 1,134,099	$ 1,139,140	$ 1,295,873	$ 1,458,643	$ 2,049,163	$ 2,401,230	$ 1,843,140	$ 2,547,764	$ 2,709,614	$ 19,848,360
In Lieu of Parkland	$ 4,425,966	$ 1,207,525	$ 1,255,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 1,005,000	$ 14,928,491
Water Funding*	$ -	$ 552,500	$ 863,620	$ 311,120	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,727,240
Sewer Funding*		$ 372,500	$ 528,500	$ 156,000	$ 179,850	$ 179,850	$ -	$ -	$ -	$ -	$ -	$ 1,416,700
External												
MPO/TDOT	$ -	$ 8,630,000	$ 1,555,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 10,185,000
Army Corp of Engineers	$ -	$ -	$ -	$ 750,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 750,000
County Facilities Tax	$ 3,262,263	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 950,000	$ 12,762,263
Utility Agreements	$ -	$ 475,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 475,000
Developer Agreements	$ 550,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 550,000
Total	$ 35,129,275	$ 20,391,669	$ 13,793,750	$ 11,469,242	$ 10,608,470	$ 10,791,232	$ 11,395,601	$ 11,760,756	$ 10,922,714	$ 11,587,751	$ 11,754,689	$ 159,605,150

**Water & Sewer resources shown only those available for Phase I capital projects. Amount to be further refined.*

Phase I CIP Project Details

Eight (8) projects are identified in the funding analysis provided herein:

- **East McEwen (Phase IV)**
- **East / Southeast Multipurpose Park**
- **Sidewalk "Gaps"**
- **Fire Station 7**
- **Franklin Road**
- **Goose Creek Interchange Lighting**
- **Major Street Resurfacing**
- **Hillsboro Road Phase II**

Phase I CIP Project Details

The following shows the financing needs for Phase I CIP projects as ranked by BOMA members and identified by staff.

	Ongoing Resources					Total Needed
	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	
Internal						
General						
Cash	$ 580,000	$ 655,000	$ 250,000	$ 250,000	$ 250,000	$ 1,985,000
Debt	$ 7,025,000	$ 5,732,880	$ 8,955,630	$15,357,300	$11,034,550	$ 48,105,360
Sanitation Fund	$ -	$ -	$ -	$ -	$ -	$ -
Road Impact Fund	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 1,250,000
Stormwater	$ 50,000	$ 50,000	$ 272,250	$ 272,250	$ -	$ 644,500
Facilities Tax	$ 225,000	$ 2,102,500	$ 3,552,500	$ 1,500,000	$ 1,500,000	$ 8,880,000
Hotel Motel	$ 195,000	$ 195,000	$ -	$ -	$ -	$ 390,000
In Lieu of Parkland	$ -	$ 250,000	$ 600,000	$ 350,000	$ 350,000	$ 1,550,000
Water Funding	$ 552,500	$ 863,620	$ 311,120	$ -	$ -	$ 1,727,240
Sewer Funding	$ 372,500	$ 528,500	$ 156,000	$ 179,850	$ 179,850	$ 1,416,700
External						
MPO/TDOT	$ 8,630,000	$ 1,555,000	$ -	$ -	$ -	$ 10,185,000
Army Corp of Engineers	$ -	$ -	$ 750,000	$ -	$ -	$ 750,000
County Facilities Tax	$ 500,000	$ 500,000	$ -	$ -	$ -	$ 1,000,000
Utility Agreements	$ 475,000	$ -	$ -	$ -	$ -	$ 475,000
Developer Agreements	$ -	$ 550,000	$ -	$ -	$ -	$ 550,000
Total	$18,855,000	$13,232,500	$15,097,500	$18,159,400	$13,564,400	$ 78,908,800

Phase I CIP Project Details

- Of the eight (8) projects in Phase I, two (Sidewalk "Gaps" & Fire Station 7) are fully funded as Pay-As-You-Go projects.

- Of the $78,908,800 in Phase I projects, $48,105,360 is proposed to be funded through debt financing, some *$14 million less* than what was proposed in August in the Debt Capacity Analysis provided by PFM.

- Of the $78,908,800 in Phase I projects, $12,960,000 (17%) comes from "External Sources"; that is, sources such as the Federal or State governments, the MPO, the County Facilities Tax, or agreements and contributions from utility companies or private developers

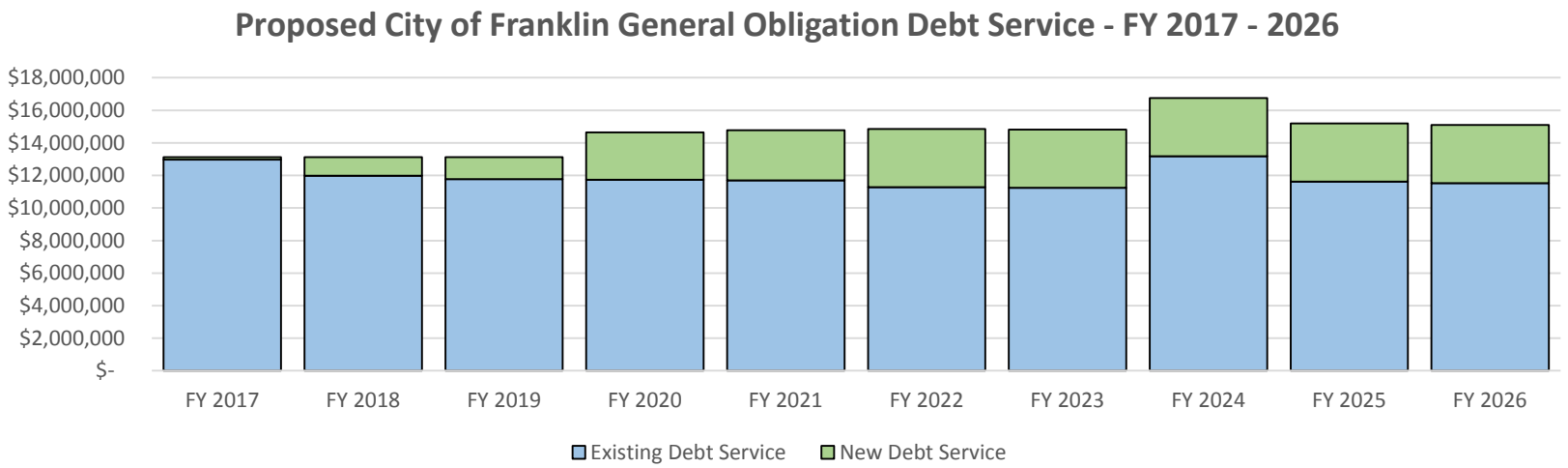
Remaining Resources

- The chart below shows the anticipated remaining resources after construction of all Phase I projects.

	FY 2017-2026 Projected Resources	Phase I Project Needs	Balance Remaining
Internal			
110 General			
Pay-as-you-go Cash [1]	$ 16,257,486	$ 1,985,000	$ 14,272,486
Debt Service [2]	$ 80,000,000	$ 48,105,360	$ 31,894,640
124 Sanitation Fund	$ 3,950,079	$ -	$ 3,950,079
128 Road Impact Fund	$ 7,118,929	$ 1,250,000	$ 5,868,929
130 Stormwater	$ 6,331,192	$ 644,500	$ 5,686,692
135 Facilities Tax	$ 30,068,411	$ 8,880,000	$ 21,188,411
150 Hotel Motel	$ 19,848,360	$ 390,000	$ 19,458,360
155 In Lieu of Parkland	$ 14,928,491	$ 1,550,000	$ 13,378,491
421 Water	$ 1,727,240	$ 1,727,240	$ -
431 Sewer	$ 1,416,700	$ 1,416,700	$ -
External			
MPO/TDOT	$ 10,185,000	$ 10,185,000	$ -
Army Corp of Engineers	$ 750,000	$ 750,000	$ -
County Facilities Tax	$ 12,762,263	$ 1,000,000	$ 11,762,263
Utility Agreements	$ 475,000	$ 475,000	$ -
Developer Contributions	$ 550,000	$ 550,000	$ -
Total	**$ 206,369,150**	**$ 78,908,800**	**$ 127,460,350**

Debt Capacity Analysis

- The model assumes three debt issuances in the next five years: $15,000,000 in FY 2017, $25,000,000 in FY 2019 and $10,000,000 in FY 2021. The chart below shows the revised debt service chart for General Obligation debt during the horizon of the CIP.



Debt Capacity Analysis & Invest *Franklin*

- The model assumes using most of the $0.07 raised through the Invest *Franklin* initiative to service debt while other funds and capital reserves will be used for pay as you go projects. The table below shows the balance of Invest *Franklin* Funds if they are used in this way.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Net Increase Debt Service Year over Year	$ 150,000	$ 1,270	$ (1,709)	$ 1,535,939	$ 1,656,442
Invest *Franklin*	$ 3,176,766	$ 3,208,534	$ 3,240,619	$ 3,273,025	$ 3,305,755
Annual Balance of Invest *Franklin* Funds	$ 3,026,766	$ 3,207,264	$ 3,242,328	$ 1,737,087	$ 1,649,314
Cumulative Net Balance Invest *Franklin*	$ 3,026,766	$ 6,234,029	$ 9,476,357	$ 11,213,444	$ 12,862,758

	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Net Increase Debt Service Year over Year	$ 1,728,537	$ 1,691,819	$ 3,628,865	$ 2,078,795	$ 1,989,809
Invest *Franklin*	$ 3,338,813	$ 3,372,201	$ 3,405,923	$ 3,439,982	$ 3,474,382
Annual Balance of Invest *Franklin* Funds	$ 1,610,276	$ 1,680,383	$ (222,941)	$ 1,361,188	$ 1,484,574
Cumulative Net Balance Invest *Franklin*	$ 14,473,034	$ 16,153,417	$ 15,930,475	$ 17,291,663	$ 18,776,237