STEGER BIZZELL
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TEXAS REGISTERED ENGINEERING FIRM F-181
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

Water Pollution Abatement Plan

and

Organized Sewage Collection System Plan

For

Woodside West - Phases A & E

In the

City of Georgetown

Williamson County, Texas

Submitted: 8/18/2023

Job Number: 22226-21-02

Water Pollution Abatement Plan
and
Organized Sewage Collection System Plan

For

Woodside West - Phases A & E

In

City of Georgetown

Williamson County, Texas

Job Number: 22226-21-02

Prepared by:

STEGER BIZZELL

Texas Registered Engineering Firm-181
1978 S. Austin Ave
Georgetown, TX 78626

Water Pollution Abatement Plan Checklist

(1) Edwards Aquifer Application Cover Page (TCEQ-20705)

(2) General Information Form (TCEQ-0587)

- Attachment A - Road Map
- Attachment B - USGS / Edwards Recharge Zone Map
- Attachment C - Project Description

(3) Geologic Assessment Form (TCEQ-0585)

- Attachment A - Geologic Assessment Table (TCEQ-0585-Table)
- Comments to the Geologic Assessment Table
- Attachment B - Soil Profile and Narrative of Soil Units
- Attachment C - Stratigraphic Column
- Attachment D - Narrative of Site Specific Geology
- Site Geologic Map(s)
- Table or list for the position of features' latitude/longitude (if mapped using GPS)

(4) Water Pollution Abatement Plan Application Form (TCEQ-0584)

- Attachment A - Factors Affecting Water Quality
- Attachment B - Volume and Character of Stormwater
- Attachment C - Suitability Letter from Authorized Agent (if OSSF is proposed)
- Attachment D - Exception to the Required Geologic Assessment (if requesting an exception)
- Site Plan

(5) Temporary Stormwater Section (TCEQ-0602)

- Attachment A - Spill Response Actions
- Attachment B - Potential Sources of Contamination
- Attachment C - Sequence of Major Activities
- Attachment D - Temporary Best Management Practices and Measures
- Attachment E - Request to Temporarily Seal a Feature, if sealing a feature
- Attachment F - Structural Practices
- Attachment G - Drainage Area Map
- Attachment H - Temporary Sediment Pond(s) Plans and Calculations
- Attachment I - Inspection and Maintenance for BMPs
- Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices

(6) Permanent Stormwater Section (TCEQ-0600)

- Attachment A - 20% or Less Impervious Cover Waiver, if project is multi-family residential, a school, or a small business and 20% or less impervious cover is proposed for the site
- Attachment B - BMPs for Upgradient Stormwater
- Attachment C - BMPs for On-site Stormwater
- Attachment D - BMPs for Surface Streams
- Attachment E - Request to Seal Features (if sealing a feature)
- Attachment F - Construction Plans
- Attachment G - Inspection, Maintenance, Repair and Retrofit Plan
- Attachment H - Pilot-Scale Field Testing Plan, if BMPs not based on Complying with the Edwards Aquifer Rules: Technical Guidance for BMPs
- Attachment I -Measures for Minimizing Surface Stream Contamination

(7) Agent Authorization Form (TCEQ-0599), if application submitted by agent

(8) Application Fee Form (TCEQ-0574)

(9) Check Payable to the "Texas Commission on Environmental Quality"

(10) Core Data Form (TCEQ-10400)

Organized Sewage Collection System Plan Checklist

- **Edwards Aquifer Application Cover Page (TCEQ-20705)**
- **General Information Form (TCEQ-0587)**

  Attachment A - Road Map
  Attachment B - USGS / Edwards Recharge Zone Map
  Attachment C - Project Description

- **Geologic Assessment Form (TCEQ-0585)**

  Attachment A - Geologic Assessment Table (TCEQ-0585-Table)
  Comments to the Geologic Assessment Table
  Attachment B - Soil Profile and Narrative of Soil Units
  Attachment C - Stratigraphic Column
  Attachment D - Narrative of Site Specific Geology
  Site Geologic Map(s)
  Table or list for the position of features' latitude/longitude (if mapped using GPS)

- **Organized Sewage Collection System Plan (TCEQ-0582)**

  Attachment A - Engineering Design Report
  Attachment B - Justification and Calculations for Deviation in Straight Alignment Without Manholes
  Attachment C - Justification for Variance from Manhole Spacing
  Attachment D - Explanation of Slopes for Flows Greater Than 10.0 Feet Per Second
  Site Plan
  Final Plan and Profile Sheets

- **Lift Station / Force Main System Application (TCEQ-0624) if applicable**

  Attachment A - Engineering Design Report
  Site Plan
  Final Plan and Profile Sheets

- **Temporary Stormwater Section (TCEQ-0602)**

  Attachment A - Spill Response Actions
  Attachment B - Potential Sources of Contamination
  Attachment C - Sequence of Major Activities
  Attachment D - Temporary Best Management Practices and Measures
  Attachment E - Request to Temporarily Seal a Feature, if sealing a feature
  Attachment F - Structural Practices
  Attachment G - Drainage Area Map
  Attachment H - Temporary Sediment Pond(s) Plans and Calculations
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- **Agent Authorization Form (TCEQ-0599), if application submitted by agent**
- **Application Fee Form (TCEQ-0574)**
- **Check Payable to the "Texas Commission on Environmental Quality"**
- **Core Data Form (TCEQ-10400)**

Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

The Edwards Aquifer Program staff conducts an administrative and technical review of all applications. The turnaround time for administrative review can be up to 30 days as outlined in 30 TAC 213.4(e). Generally administrative completeness is determined during the intake meeting or within a few days of receipt. The turnaround time for technical review of an administratively complete Edwards Aquifer application is 90 days as outlined in 30 TAC 213.4(e). Please know that the review and approval time is directly impacted by the quality and completeness of the initial application that is received. In order to conduct a timely review, it is imperative that the information provided in an Edwards Aquifer application include final plans, be accurate, complete, and in compliance with 30 TAC 213.

Administrative Review

1. Edwards Aquifer applications must be deemed administratively complete before a technical review can begin. To be considered administratively complete, the application must contain completed forms and attachments, provide the requested information, and meet all the site plan requirements. The submitted application and plan sheets should be final plans. Please submit one full-size set of plan sheets with the original application, and half-size sets with the additional copies.

   To ensure that all applicable documents are included in the application, the program has developed tools to guide you and web pages to provide all forms, checklists, and guidance. Please visit the below website for assistance: http://www.tceq.texas.gov/field/eapp.

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.

3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.

4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

   An appointment should be made to resubmit the application. The application is re-examined to ensure all deficiencies are resolved. The application will only be deemed administratively complete when all administrative deficiencies are addressed.

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.

6. If the geologic assessment was completed before October 1, 2004 and the site contains "possibly sensitive" features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.

2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be clearly marked, features identified in the geologic assessment should be flagged, roadways marked and the alignment of the Sewage Collection System and manholes should be staked at the time the application is submitted. If the site is not marked the application may be returned.

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or if not withdrawn the application will be denied and the application fee will be forfeited.
4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

Mid-Review Modifications

It is important to have final site plans prior to beginning the permitting process with TCEQ to avoid delays.

Occasionally, circumstances arise where you may have significant design and/or site plan changes after your Edwards Aquifer application has been deemed administratively complete by TCEQ. This is considered a "Mid-Review Modification". Mid-Review Modifications may require redistribution of an application that includes the proposed modifications for public comment.

If you are proposing a Mid-Review Modification, two options are available to you:

- You can withdraw your application, and your fees will be refunded or credited for a resubmittal.
- TCEQ can continue the technical review of the application as it was submitted, and a modification application can be submitted at a later time.

If the application is withdrawn, the resubmitted application will be subject to the administrative and technical review processes and will be treated as a new application. The application will be redistributed to the effected jurisdictions.

Please contact the regional office if you have questions. If your project is located in Williamson, Travis, or Hays County, contact TCEQ's Austin Regional Office at 512-339-2929. If your project is in Comal, Bexar, Medina, Uvalde, or Kinney County, contact TCEQ's San Antonio Regional Office at 210-490-3096

Please fill out all required fields below and submit with your application.

1. Regulated Entity Name: Woodside West - Phases A & E						**2. Regulated Entity No.:** N/A			
3. Customer Name: MK Woodside Development, Inc.						**4. Customer No.:** CN606076271			
5. Project Type: (Please circle/check one)	New		Modification			Extension		Exception	
6. Plan Type: (Please circle/check one)	WPAP	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: (Please circle/check one)	Residential		Non-residential			**8. Site (acres):**			71.26
9. Application Fee:	$9,108.50		**10. Permanent BMP(s):**			Batch Detention Pond/ Vegetative filter Strips			
11. SCS (Linear Ft.):	5,217		**12. AST/UST (No. Tanks):**			N/A			
13. County:	Williamson		**14. Watershed:**			Berry Creek			

Application Distribution

Instructions: Use the table below to determine the number of applications required. One original and one copy of the application, plus additional copies (as needed) for each affected incorporated city, county, and groundwater conservation district are required. Linear projects or large projects, which cross into multiple jurisdictions, can require additional copies. Refer to the "Texas Groundwater Conservation Districts within the EAPP Boundaries" map found at:

http://www.tceq.texas.gov/assets/public/compliance/field_ops/eapp/EAPP%20GWCD%20map.pdf

For more detailed boundaries, please contact the conservation district directly.

Austin Region			
County:	**Hays**	**Travis**	**Williamson**
Original (1 req.)	___	___	✖
Region (1 req.)	___	___	✖
County(ies)	___	___	✖
Groundwater Conservation District(s)	___Edwards Aquifer Authority ___Barton Springs/ Edwards Aquifer ___Hays Trinity ___Plum Creek	___Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	___Austin ___Buda ___Dripping Springs ___Kyle ___Mountain City ___San Marcos ___Wimberley ___Woodcreek	___Austin ___Bee Cave ___Pflugerville ___Rollingwood ___Round Rock ___Sunset Valley ___West Lake Hills	___Austin ___Cedar Park ___Florence ✖Georgetown ___Jerrell ___Leander ___Liberty Hill ___Pflugerville ___Round Rock

San Antonio Region					
County:	**Bexar**	**Comal**	**Kinney**	**Medina**	**Uvalde**
Original (1 req.)	___	___	___	___	___
Region (1 req.)	___	___	___	___	___
County(ies)	___	___	___	___	___
Groundwater Conservation District(s)	___ Edwards Aquifer Authority ___Trinity-Glen Rose	___Edwards Aquifer Authority	___Kinney	___EAA ___Medina	___EAA ___Uvalde
City(ies) Jurisdiction	___Castle Hills ___Fair Oaks Ranch ___Helotes ___Hill Country Village ___Hollywood Park ___San Antonio (SAWS) ___Shavano Park	___Bulverde ___Fair Oaks Ranch ___Garden Ridge ___New Braunfels ___Schertz	NA	___San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review. Bryan E. Moore	
Print Name of Customer/Authorized Agent	
Signature of Customer/Authorized Agent	Date: 8/18/2023

FOR TCEQ INTERNAL USE ONLY				
Date(s)Reviewed:		Date Administratively Complete:		
Received From:		Correct Number of Copies:		
Received By:		Distribution Date:		
EAPP File Number:		Complex:		
Admin. Review(s) (No.):		No. AR Rounds:		
Delinquent Fees (Y/N):		Review Time Spent:		
Lat./Long. Verified:		SOS Customer Verification:		
Agent Authorization Complete/Notarized (Y/N):		Fee Check:	Payable to TCEQ (Y/N):	
Core Data Form Complete (Y/N):			Signed (Y/N):	
Core Data Form Incomplete Nos.:			Less than 90 days old (Y/N):	

General Information Form

Texas Commission on Environmental Quality

For Regulated Activities on the Edwards Aquifer Recharge and Transition Zones and Relating to 30 TAC §213.4(b) & §213.5(b)(2)(A), (B) Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

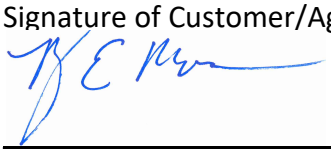
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **General Information Form** is hereby submitted for TCEQ review. The application was prepared by:

Print Name of Customer/Agent: MK Woodside Development, Inc. / Steger Bizzell, Bryan Moore, P.E.

Date: 8/18/2023

Signature of Customer/Agent:



Project Information

1. Regulated Entity Name: Woodside West - Phases A & E
2. County: Williamson
3. Stream Basin: Berry Creek
4. Groundwater Conservation District (If applicable): _____
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

   ☒ WPAP
   ☒ SCS
   ☐ Modification
   ☐ AST
   ☐ UST
   ☐ Exception Request

7. Customer (Applicant):

   Contact Person: Blake Magee
   Entity: MK Woodside Development, Inc.
   Mailing Address: 1011 North Lamar
   City, State: Austin, TX Zip: 78703
   Telephone: (512) 481-0303 FAX: N/A
   Email Address: blake@blakemageeco.com

8. Agent/Representative (If any):

   Contact Person: Bryan Moore, P.E.
   Entity: Steger Bizzell
   Mailing Address: 1978 S. Austin Ave
   City, State: Georgetown, TX Zip: 78626
   Telephone: 512-930-9412 Fax: N/A
   Email Address: bmoore@stegerbizzell.com

9. Project Location:

   ☒ The project site is located inside the city limits of Georgetown.
   ☐ The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of _____.
   ☐ The project site is not located within any city's limits or ETJ.

10. ☒ The location of the project site is described below. The description provides sufficient detail and clarity so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.

    FROM AUSTIN: HEADING NORTH ON I-35, TAKE EXIT 266 TOWARD TX-195 N. AFTER APPROXIMATELY 0.2 MILES, TURN LEFT ONTO TX-195 W. AFTER APPROXIMATELY 5.3 MILES, TURN LEFT ONTO RATTLESNAKE RD. AFTER APPROXIMATELY 0.6 MILES, TURN LEFT ONTO RONALD REAGAN BLVD. CONTINUE STRAIGHT FOR APPROXIMATELY 0.8 MILES AND THE SITE WILL BE ON THE LEFT.

11. ☒ **Attachment A – Road Map**. A road map showing directions to and the location of the project site is attached. The project location and site boundaries are clearly shown on the map.

12. ☒ **Attachment B - USGS / Edwards Recharge Zone Map**. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached. The map(s) clearly show:

    ☒ Project site boundaries.
    ☒ USGS Quadrangle Name(s).
    ☒ Boundaries of the Recharge Zone (and Transition Zone, if applicable).
    ☒ Drainage path from the project site to the boundary of the Recharge Zone.

13. ☒ **The TCEQ must be able to inspect the project site or the application will be returned**. Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate

the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment.

☒ Survey staking will be completed by this date: 09/18/2023

14. ☒ **Attachment C – Project Description**. Attached at the end of this form is a detailed narrative description of the proposed project. The project description is consistent throughout the application and contains, at a minimum, the following details:

☒ Area of the site
☒ Offsite areas
☒ Impervious cover
☒ Permanent BMP(s)
☒ Proposed site use
☒ Site history
☒ Previous development
☒ Area(s) to be demolished

15. Existing project site conditions are noted below:

☐ Existing commercial site
☐ Existing industrial site
☐ Existing residential site
☐ Existing paved and/or unpaved roads
☐ Undeveloped (Cleared)
☒ Undeveloped (Undisturbed/Uncleared)

☐ Other: _____

Prohibited Activities

16. ☒ I am aware that the following activities are prohibited on the Recharge Zone and are not proposed for this project:

(1) Waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);

(2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;

(3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;

(4) The use of sewage holding tanks as parts of organized collection systems; and

(5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

(6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.

17. ☒ I am aware that the following activities are prohibited on the Transition Zone and are not proposed for this project:

(1) Waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);

(2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and

(3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

Administrative Information

18. The fee for the plan(s) is based on:

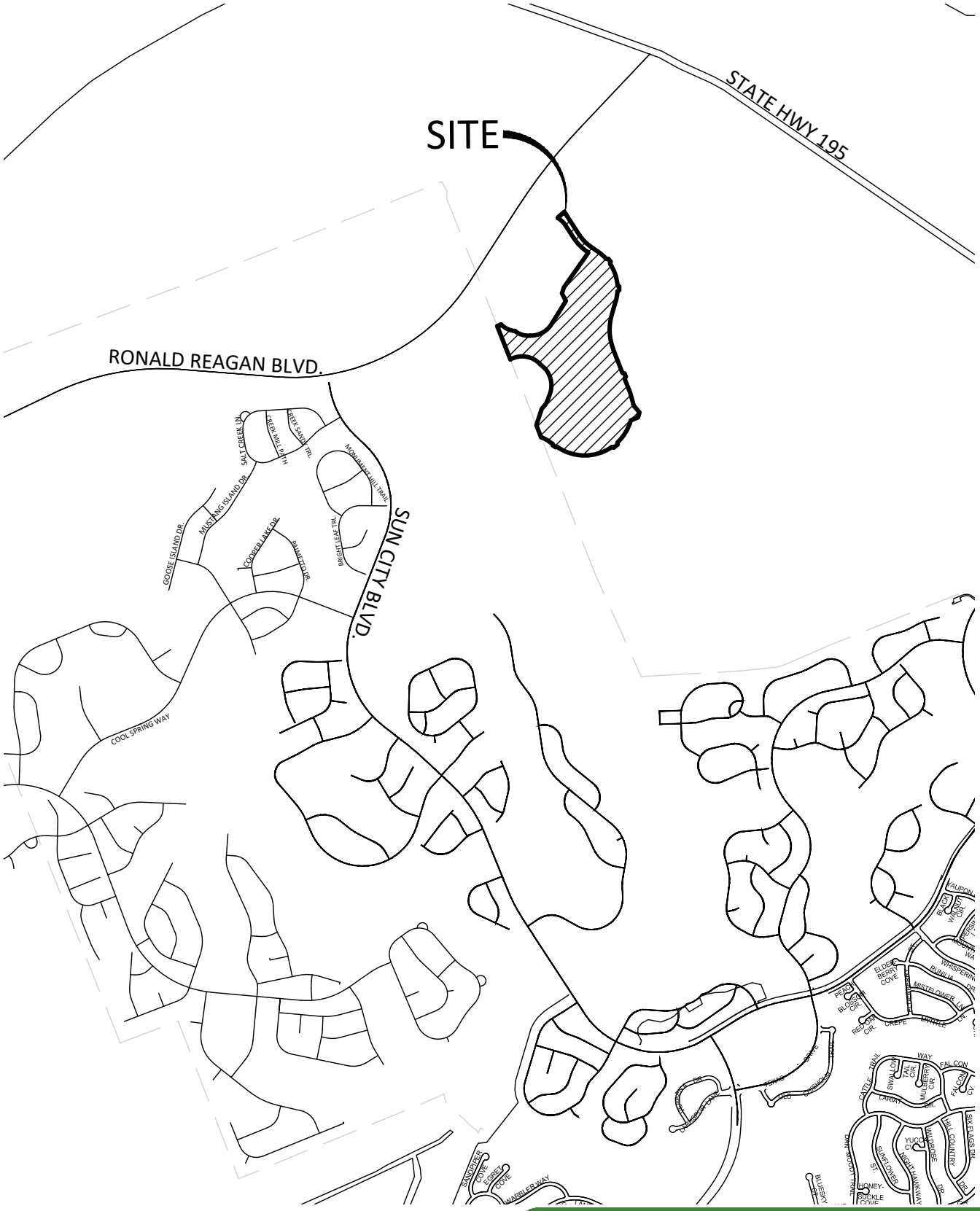
☒ For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
☒ For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
☐ For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.
☐ A request for an exception to any substantive portion of the regulations related to the protection of water quality.
☐ A request for an extension to a previously approved plan.

19. ☒ Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

☐ TCEQ cashier
☒ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
☐ San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

20. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

21. ☒ No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.



ROAD MAP
ATTACHMENT A

SCALE: 1" = 2000'

STEGER BIZZELL

ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

JOB NO. 22226 - 21 -01

08/18/2023

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

GEORGETOWN QUADRANGLE
TEXAS–WILLIAMSON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

SITE

Recharge Zone

Contributing Zone

Recharge Zone

Recharge Zone

Transition Zone

Produced by the United States Geological Survey

Control by USGS and NOS/NOAA

Compiled from aerial photographs taken 1974. Field checked 1975
Map edited 1982

North American Datum of 1927 (NAD 27). Projection and 10 000-foot ticks: Texas Coordinate System, central zone (Lambert Conformal Conic)
Blue 1000-meter Universal Transverse Mercator ticks, zone 14

North American Datum of 1983 (NAD 83) is shown by dashed corner ticks. The values of the shift between NAD 27 and NAD 83 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software

Red tint indicates areas in which only landmark buildings are shown

Fine red dashed lines indicate selected fence lines

Areas covered by dashed light-blue pattern are subject to controlled inundation

UTM GRID AND 1982 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U. S. Route
State Route

QUADRANGLE LOCATION

3097-313

GEORGETOWN, TX
30097-F6-TF-024

1982

JOB No. 22226-21-01

WOODSIDE WEST PHASES A & E
WILLIAMSON COUNTY, TEXAS

2

ISBN 0-607-51004-6

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WEIR QUADRANGLE
TEXAS–WILLIAMSON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE/4 ROUND ROCK 15' QUADRANGLE

Recharge Zone

Transition Zone

Mapped, edited, and published by the Geological Survey

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1974. Field checked 1975. Map edited 1982

Projection and 10,000-foot grid ticks: Texas coordinate system, central zone (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid, zone 14
1927 North American datum
To place on the predicted North American Datum 1983 move the projection lines 17 meters south and 28 meters east as shown by dashed corner ticks

Fine red dashed lines indicate selected fence lines

UTM GRID AND 1982 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
DOTTED LINES REPRESENT 5-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U. S. Route
State Route

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1982

QUADRANGLE LOCATION

3097-314

WEIR, TEX.
NE/4 ROUND ROCK 15' QUADRANGLE
N3037.5–W9730/7.5
1982
JOB No. 22226-21-01

WOODSIDE WEST PHASES A & E
WILLIAMSON COUNTY, TEXAS

P:\22000-22999\22226 Sun City\21-Madison Tract\02 WEST\01 PHASE A\Documents\TCEQ\WPAP_SCS\Attachment B-USGS Maps.dwg, Sheet 4, 8/16/2023 2:37:47 PM

Attachment C – Project Description

This project consists of the first phases of a high-quality residential development to be known as Woodside. Woodside West - Phases A & E will be a continuation of Sun City, Texas. A sewage collection to serve residential units will be built on site and tied into the wastewater line included Woodside Offsite Improvements, which was submitted to TCEQ (RN111600748) . Its collection system will be connected to the existing 21-inch wastewater interceptor along the east boundary of the property.

The site is limits of construction is 71.26 acres. The site is located in Georgetown, Texas and bound by Ronald Reagan Blvd to the north, Berry Creek to the west, and TX-195 to the east. The land was previously used for ranchland with no previous development.

The WPAP & SCS application will include paving, drainage, water and wastewater quality improvements to Woodside West - Phases A & E. The neighborhood includes 108 lots.

The proposed wastewater system will consist of an 8-inch SDR-26 PVC wastewater line. This system will ultimately flow to the existing Sun City Lift Station along Berry Creek. The wastewater will then be conveyed to the City of Georgetown Pecan Branch Wastewater Treatment Plant.

Suspended solid and pollutant removal will be done by the use of three Batch Detention Ponds, Pond C1, Pond C2 and Pond C3 that are included with this project, as well as Vegetative filter strips to achieve an eighty-five percent removal. The site generally drains from northwest to southeast and into Berry Creek. Offsite areas to the east of the project limits will be diverted around the proposed Woodside West - Phases A & E.

The limit Woodside West - Phases A & E SCS WPAP is 71.26 acres. The proposed impervious cover within the neighborhood will be 22.49 acres and 31.56%.

There is one sensitive feature located within the overall 468 acre project boundary but is well outside the limits of improvements included in this application. This is shown and described within the attached geologic assessment. The MK Woodside Development property is approximately 468 acres. The geologic assessment included with the project is for 510 acres and includes two future commercial tracts on either side of the Above and Beyond Way entry from RRB.

aci consulting
austin • denver

GEOLOGIC ASSESSMENT FOR THE APPROXIMATELY 510-ACRE WOODSIDE TRACT

Williamson County, Texas

September 2022

Submitted to:
Blake Magee Company
1011 North Lamar
Austin, Texas 78703

Prepared by:
aci consulting
1001 Mopac Circle
Austin, Texas 78746
TBPG Firm License No. 50260

aci project #: 22-22-138

Geologic Assessment

Texas Commission on Environmental Quality

For Regulated Activities on The Edwards Aquifer Recharge/transition Zones and Relating to 30 TAC §213.5(b)(3), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

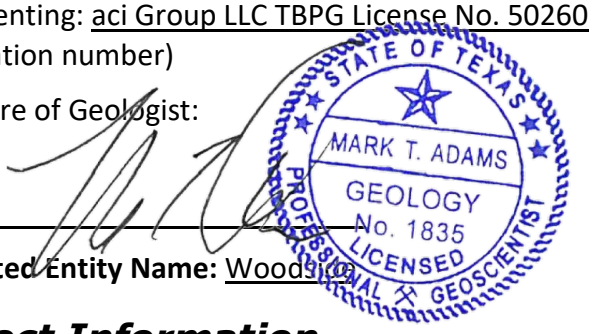
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Print Name of Geologist: Mark T. Adams Telephone: (512) 347-9000

Date: 9/12/2022 Fax: (512) 306-0974

Representing: aci Group LLC TBPG License No. 50260 (Name of Company and TBPG or TBPE registration number)

Signature of Geologist: 

9-13-2022

Regulated Entity Name: Woodson

Project Information

1. Date(s) Geologic Assessment was performed: 3/15/2021 & 3/17/2021
2. Type of Project:
   - ☒ WPAP
   - ☒ SCS
   - ☐ AST
   - ☐ UST
3. Location of Project:
   - ☒ Recharge Zone
   - ☐ Transition Zone
   - ☐ Contributing Zone within the Transition Zone

4. ☒ **Attachment A - Geologic Assessment Table**. Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.

5. ☒ Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
DoC—Doss silty clay, moist, 1 to 5 percent slopes	D	1.6
EaD—Eckrant cobbly clay, 1 to 8 percent slopes	D	1.6
EeB—Eckrant stony clay, 0 to 3 percent slopes, stony	D	1.6
GeB—Georgetown clay loam, 0 to 2 percent slopes	D	3.3
GsB—Georgetown stony clay loam, 1 to 3 percent slopes	D	3.3

** Soil Group Definitions (Abbreviated)*

A. Soils having a high infiltration rate when thoroughly wetted.

B. Soils having a moderate infiltration rate when thoroughly wetted.

C. Soils having a slow infiltration rate when thoroughly wetted.

D. Soils having a very slow infiltration rate when thoroughly wetted.

6. ☒ **Attachment B – Stratigraphic Column**. A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.

7. ☒ **Attachment C – Site Geology**. A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.

8. ☒ **Attachment D – Site Geologic Map(s)**. The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1”: 400'

Applicant's Site Plan Scale: 1" = 100'
Site Geologic Map Scale: 1" = 100'
Site Soils Map Scale (if more than 1 soil type): 1" = 1,500'

9. Method of collecting positional data:

   ☒ Global Positioning System (GPS) technology.
   ☐ Other method(s). Please describe method of data collection: _____

10. ☒ The project site and boundaries are clearly shown and labeled on the Site Geologic Map.

11. ☒ Surface geologic units are shown and labeled on the Site Geologic Map.

12. ☒ Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.

    ☐ Geologic or manmade features were not discovered on the project site during the field investigation.

13. ☒ The Recharge Zone boundary is shown and labeled, if appropriate.

14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.

    ☒ There are 2 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
    ☐ The wells are not in use and have been properly abandoned.
    ☒ The wells are not in use and will be properly abandoned.
    ☐ The wells are in use and comply with 16 TAC Chapter 76.
    ☐ There are no wells or test holes of any kind known to exist on the project site.

Administrative Information

15. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

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TABLE OF CONTENTS

LIST OF ATTACHMENTS

Geologic Assessment for the Woodside Tract located in Williamson County, Texas

September 2022

1.0 INTRODUCTION

The Texas Commission on the Environmental Quality (TCEQ) regulates activities that have the potential to pollute the Edwards Aquifer through the Edwards Aquifer Protection Program. Projects meeting a certain criterion over the Edwards Aquifer Recharge Zone must submit an Edwards Aquifer Protection Plan (EAPP).

The purpose of this report is to identify all potential pathways for contaminant movement to the Edwards Aquifer and provide sufficient geologic information so that the appropriate Best Management Practices (BMPs) can be proposed in the Edwards Aquifer Protection Plan (EAPP). This report complies with the requirements of Title 30, Texas Administrative Code (TAC) Chapter 213 relating to the protection of the Edwards Aquifer Recharge Zone. Per the Rules, the Geologic Assessment must be completed by a Geologist licensed according to the Texas Geoscience Practice Act.

2.0 PROJECT INFORMATION

The Woodside Tract (previously known as the Madison Tract and the Fakhr Tract), hereafter referred to as the subject area or site, is located approximately 1 mile northwest of the intersection of Sun City Blvd and Highway 195, in the City of Georgetown, Williamson County, Texas (**Attachment A, Figure 1**). Investigations of the subject area were initiated in 2004, as part of Karst Feature Assessment (2006) on the western portion of the tract, previously known as the Fakhr Tract (**Attachment A, Figure 1**). This included an assessment of previously documented karst features to determine, if any, development restrictions for the entity Madison Realty Investors, Inc., within the Fakhr Tract subject area (report available upon request). Geologic work for this portion of the subject area continued in 2012, where M. Trojan & Associates conducted a geologic assessment for the Fakhr Tract (report available upon request).

Additional pedestrian surveys were conducted subsequent to the listed reports, with the final remaining 167 acres of the Woodside Tract surveyed on March 15th and March 17th, 2021, by Kara Posso, G.I.T., Marcos Cardenas, Sarah King, Joey O'Keefe, and Erin Wilson,

under the supervision of Mark Adams, P.G. with **aci consulting**. Information from the Geologic Assessment done by M. Trojan & Associates for the Fakhr Property (2012), as well as work done by **aci consulting** was compiled and used to generate this report for the Woodside Tract.

This report is intended to satisfy the requirements for a Geologic Assessment, which shall be included as a component of a Water Pollution Abatement Plan (WPAP) and Sewage Collection System Plan (SCS). The site is approximately 510 acres in total. The proposed site use is for low-density, single-family, residential development, as well as multifamily residential development, and commercial development. The scope of the report consists of a site reconnaissance, field survey, and review of existing data and reports. Features identified during the field survey were ranked utilizing the Texas Commission on Environmental Quality (TCEQ) matrix for Edwards Aquifer Recharge Zone features. The ranking of the features will determine their viability as "sensitive" features.

3.0 INVESTIGATION METHODS

The following investigation methods and activities were used to develop this report:

- Review of existing files and literature to determine the regional geology and any known caves associated with the project area;
- Review of past geological field reports, cave studies, and correspondence regarding the existing geologic features on the project area, if available;
- Site reconnaissance by a registered professional geologist to identify and examine caves, recharge features, and other significant geological structures;
- Evaluation of collected field data and a ranking of features using the TCEQ Ranking Table 0585 for the Edwards Aquifer Recharge Zone; and
- Review of historic aerial photographs to determine if there are any structural features present, and to determine any past disturbances on the subject property.

4.0 SOILS AND GEOLOGY

The following includes a site-specific description of the soils, geologic stratigraphy, geologic structure, and karstic characteristics as they relate to the Edwards aquifer. Also included in this section is a review of historic aerials for presence of geologic changes or changes to manmade features in bedrock.

Soils

According to the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Web Soil Survey (2021), five soil units occur within the project alignment (**Attachment A, Figure 2**):

- DoC—Doss silty clay, moist, 1 to 5 percent slopes

The Doss component makes up 85 percent of the map unit. Slopes are 1 to 5 percent. This component is on hillslopes on dissected plateaus. The parent material consists of residuum weathered from limestone. Depth to a root restrictive layer, bedrock, paralithic, is 11 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R081CY574TX Shallow 29-35 Pz ecological site. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 55 percent. There are no saline horizons within 30 inches of the soil surface. This soil does not meet the criteria for hydric soils. Hydrologic Soil Group: D.

- EaD—Eckrant cobbly clay, 1 to 8 percent slopes

The Eckrant component makes up 85 percent of the map unit. Slopes are 1 to 8 percent. This component is on ridges on dissected plateaus. The parent material consists of residuum weathered from limestone. Depth to a root restrictive layer, bedrock, lithic, is 4 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 6 percent. This component is in the R081CY360TX Low Stony Hill 29-35 Pz ecological site. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 2 percent. There are no saline horizons within 30 inches of the soil surface. This soil does not meet the criteria for hydric soils. Hydrologic Soil Group: D.

- EeB—Eckrant stony clay, 0 to 3 percent slopes, stony

The Eckrant, stony component makes up 85 percent of the map unit. Slopes are 0 to 3 percent. This component is on ridges on dissected plateaus. The parent material consists of residuum weathered from limestone. Depth to a root restrictive layer, bedrock, lithic, is 4 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 6 percent. This component is in the R081CY360TX Low Stony Hill 29-35 Pz ecological site. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 2 percent. There are no saline horizons within 30 inches of the soil surface. This soil does not meet the criteria for hydric soils. Hydrologic Soil Group: D.

- GeB—Georgetown clay loam, 0 to 2 percent slopes

The Georgetown component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on broad ridges on dissected plateaus. The parent material consists of clayey residuum weathered from limestone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the R081CY361TX Redland 29-35 Pz ecological site. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. This soil does not meet the criteria for hydric soils. Hydrologic Soil Group: D.

- GsB—Georgetown stony clay loam, 1 to 3 percent slopes

The Georgetown component makes up 90 percent of the map unit. Slopes are 1 to 3 percent. This component is on broad ridges on dissected plateaus. The parent material consists of clayey residuum weathered from limestone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter

content in the surface horizon is about 3 percent. This component is in the R081CY361TX Redland 29-35 Pz ecological site. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. This soil does not meet the criteria for hydric soils. Hydrologic Soil Group: D.

Geologic Stratigraphy

According to the *Geologic Map of the Georgetown Quadrangle, Texas*, and the *Geologic Map of the Cobbs Cavern Quadrangle, Texas,* two geologic units occur within the project area (**Attachment A, Figure 3**). These units and a description by Collins et al., (1997) are as follows:

- Georgetown Formation (Kgt)

"Limestone and marl. Nodular, very fossiliferous, diagnostic marine megafossils include *Waconella wacoensis* (formerly *Kingena wacoensis*) and *Gryphaea washitaensis*. Rare small vugs. Uppermost Edwards aquifer strata. Thickness increases northward from ~65ft to 110ft."

- Edwards Limestone (Ked)

"Limestone, dolomitic limestone and marl. Massive to thin beds, chert, and fossiliferous; fossils include rudistids. Shallow subtidal to tidal-flat cycles. Honeycomb textures, voids in collapsed breccias, and cavern systems. Accounts for most of the Edwards aquifer strata. Thickness is between 100ft to 300ft; thins northward."

Site-Specific Stratigraphic Column

Formation	Members	Thickness (Collins et al., 1997)
Georgetown Formation		65-110 feet
Edwards Limestone		100-300 feet

Geologic Structure

The geologic strata associated with the Edwards Aquifer include the Georgetown Limestone Formation of the Washita Group, the Edwards Limestone Group, which is interfingered with the Comanche Peak Formation, followed by the Walnut formation, and finally the Glen Rose Formation of the Trinity Group. These Groups dip gently to the southeast and are a characterized by the Balcones Fault Escarpment, a zone of en echelon

normal faults downthrown to the southeast. Locally, the dominant structural trend of faults within the area is 25°, as evidenced by the mapped fault patterns (**Attachment A, Figure 4**). Thus, all features that have a trend ranging from 05° to 40° are considered "on trend" and were awarded the additional 10 points in the Geologic Assessment Table.

The subject area is underlain by Kgt and Ked (Collins et al., 1997). The Georgetown Formation overlies the Edwards Limestone Formation on-site. The contact between the two units is present in the southwestern portion of the subject area. The contact was exhibited as gradient with Georgetown Formation float rocks present on top of Edwards Limestone bedrock.

Karstic Characteristics

In limestone landscapes, karst is expressed by erratically developed cavernous porosity from dissolution of bedrock as water combined with weak acids moves through the subsurface. Karst terrains are typical of the Edwards Limestone, occurring across a vast region of Central Texas, including the Balcones Fault Escarpment. The features produced by karst processes include, but are not limited to, sinkholes, solution cavities, solution enlarged fractures, and caves. These features can eventually provide conduits for fluid movement such as surface water runoff, as "point recharge" to the Edwards Aquifer. Faults and manmade features within bedrock can also provide conduits for point recharge in many cases.

According to Edwards aquifer zone map produced by the TCEQ (2005), the entire subject area is within the northern segment of the Edwards Aquifer Recharge Zone. Thus, all karst features identified as sensitive within the project limits have the potential to be point recharge features into the Edwards aquifer.

Review of Historic Aerials

Aerial photographs were reviewed for the site and it was determined that ranching and agricultural activities occurred on the site since the first aerial image dated 1941 (**Attachment C**). Evidence of a rural residence or agricultural structure, and associated road, are first visible in the eastern portion of the tract in the 1953 aerial. The 1981 aerial shows the initial stages of a quarry development offsite, along the northeastern property boundary. In the 2004 aerial, a residential subdivision is first visible to the south of the site and expands to the west of the site in the 2010 aerial.

5.0 SUMMARY OF FINDINGS

This report documents the findings of several geologic assessments and karst surveys conducted on the Woodside Tract since 2004. **aci consulting** conducted a geologic assessment for a previously un-surveyed 167-acre portion of the Woodside Tract on March 15th, 2021, and March 17th, 2021. Descriptions, recommendations, and locations for these features can be found in **Attachment B**. Based on the identification and assessment of each feature, it was determined that there is one sensitive naturally occurring feature (M-04). This feature will require a 50-foot setback around the the sink of the feature.

Three (karst) features were identified in the 2012 geologic assessment conducted by M. Trojan and Associates (report available upon request). The findings from that report indicate one feature (F-01) is sensitive and the other two are non-sensitive. **aci consulting** attempted to locate F-01 during the most recent survey conducted in 2021. This feature was not identified by **aci consulting** during the field work conducted in 2021 or during previous work within the site.

Of the sensitive features identified in the 2006 assessment for the greater Fakhr Tract, several were determined to be eligible for inclusion in the regional habitat plan and have been transferred to Williamson County. The remaining features not transferred to Williamson County were determined to be non-sensitive (**Attachment C**) (Report available upon request).

Over the course of multiple investigations on the tract and a follow up re-evaluation, only one naturally occurring karst feature has been identified and rated as sensitive. This feature is included in this report as M-04. The portion of the of the Fakhr Tract with a high density of sensitive caves and features was deeded to Williamson County as part of the Percilla's Well Karst Preserve and is under the control of the county. Subsequent investigations by others not available for this report revealed no additional sensitive features.

6.0 REFERENCES

Collins, E.W., 1997. *Geologic Map of the Georgetown Quadrangle, Texas*. Bureau of Economic Geology. Austin, Texas.

Collins, E.W., 1997. *Geologic Map of the Cobbs Cavern Quadrangle, Texas.* Bureau of Economic Geology. Austin, Texas.

(TCEQ) Texas Commission on Environmental Quality. 2004. Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones. October 1, 2004. Austin, Texas.

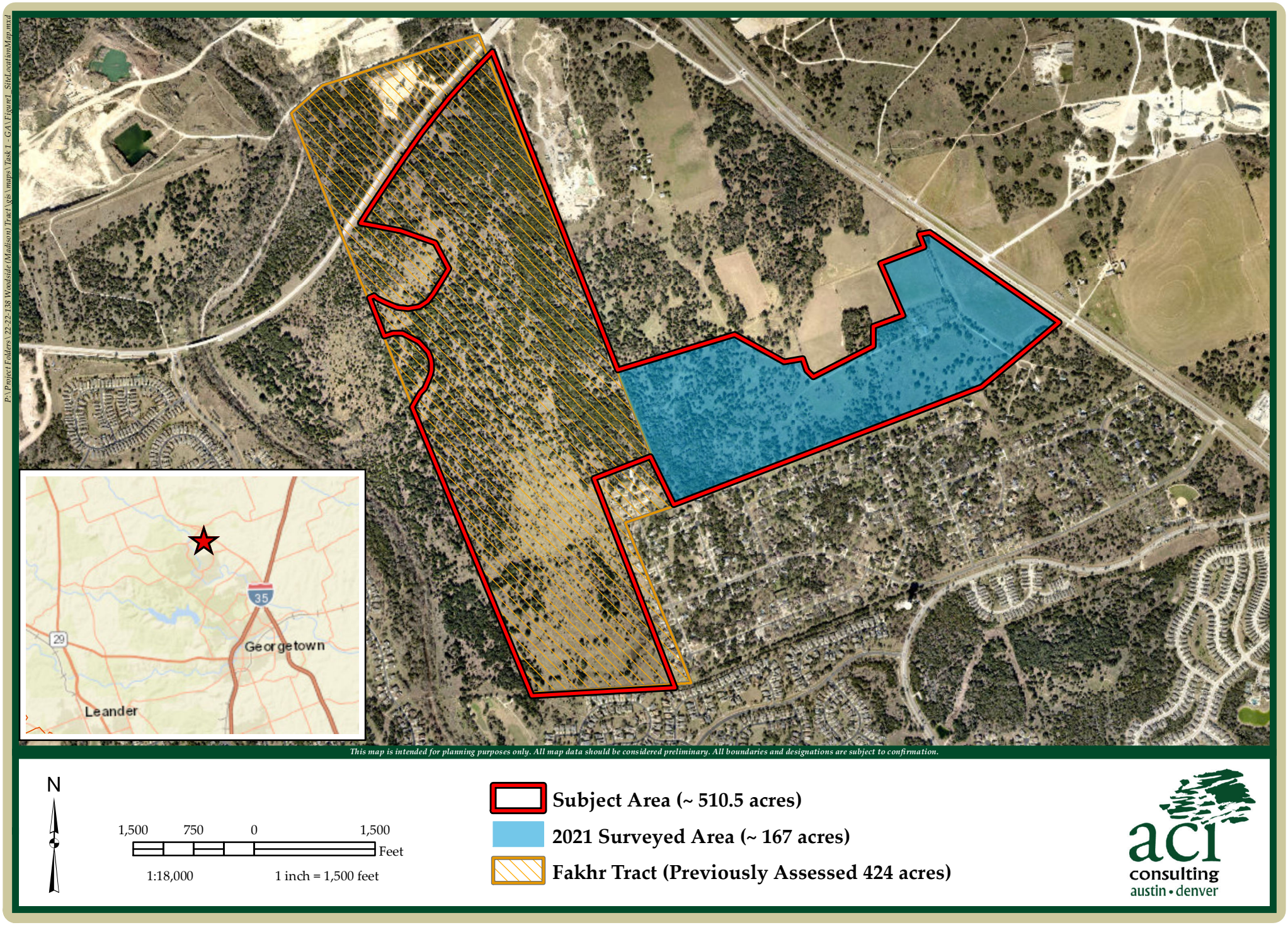
(TCEQ) Texas Commission on Environmental Quality. 2005. "Edwards Aquifer Protection Program, Chapter 213 Rules - Recharge Zone, Transition Zone, Contributing Zone, and Contributing Zone within the Transition Zone." Map. Digital data. September 1, 2005. Austin, Texas.

(TWDB) Texas Water Development Board. 2021. Water Data Interactive Groundwater Data Viewer. Accessed on March 22, 2021. Available at: http://www2.twdb.texas.gov/apps/waterdatainteractive/groundwaterdataviewer

(USDA NRCS) U.S. Department of Agriculture Natural Resources Conservation Service. 2021. WebSoilSurvey.com. Soil Survey Area: Williamson County, Texas. Date accessed: March 22, 2021.

ATTACHMENT A

Site Maps

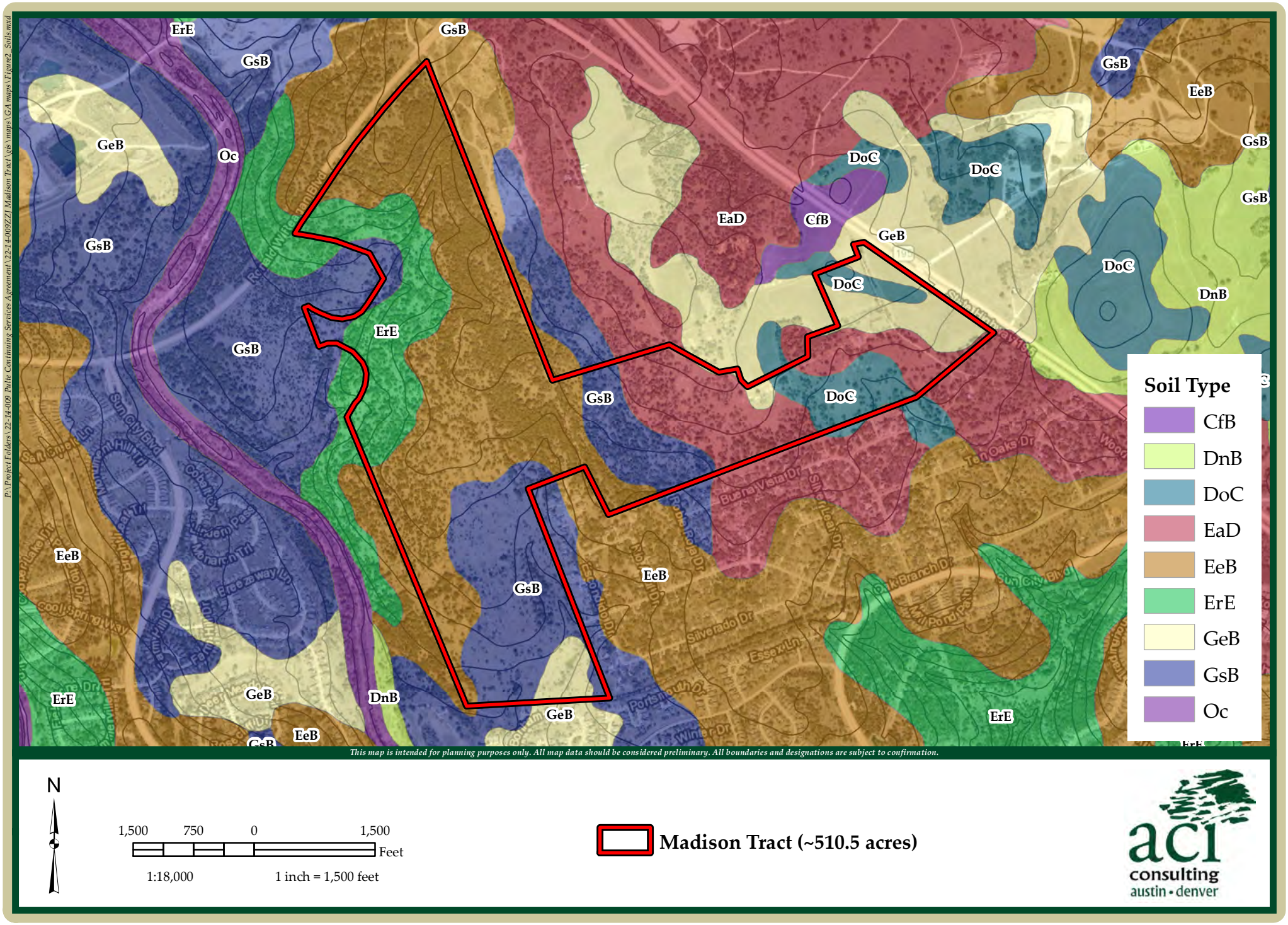


Woodside Tract

aci Project No.: 22-22-138

Figure 1: Site Location Map

September 2022

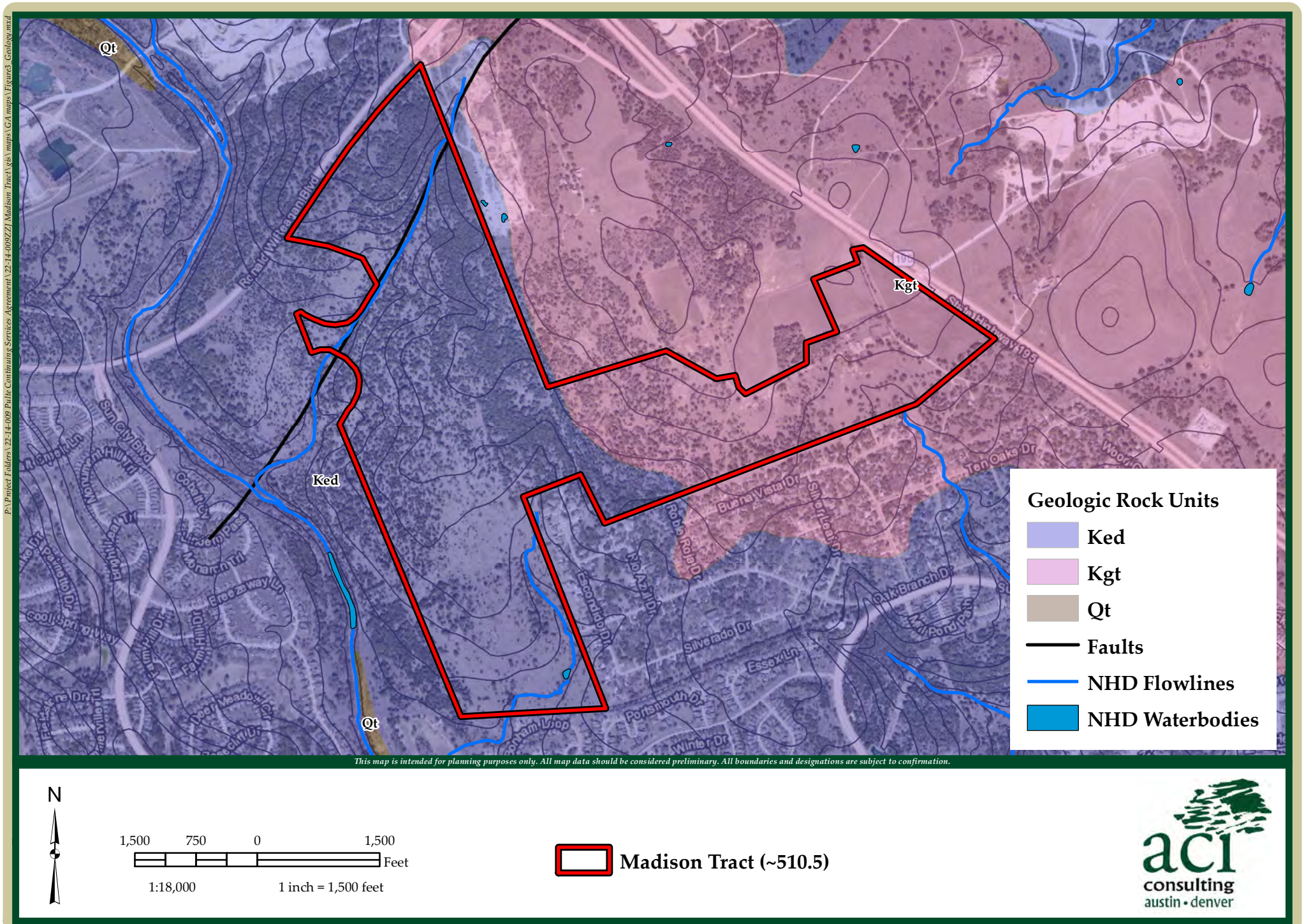


Woodside Tract

aci Project No.: 22-22-138

Figure 2: Site Soil Maps

September 2022

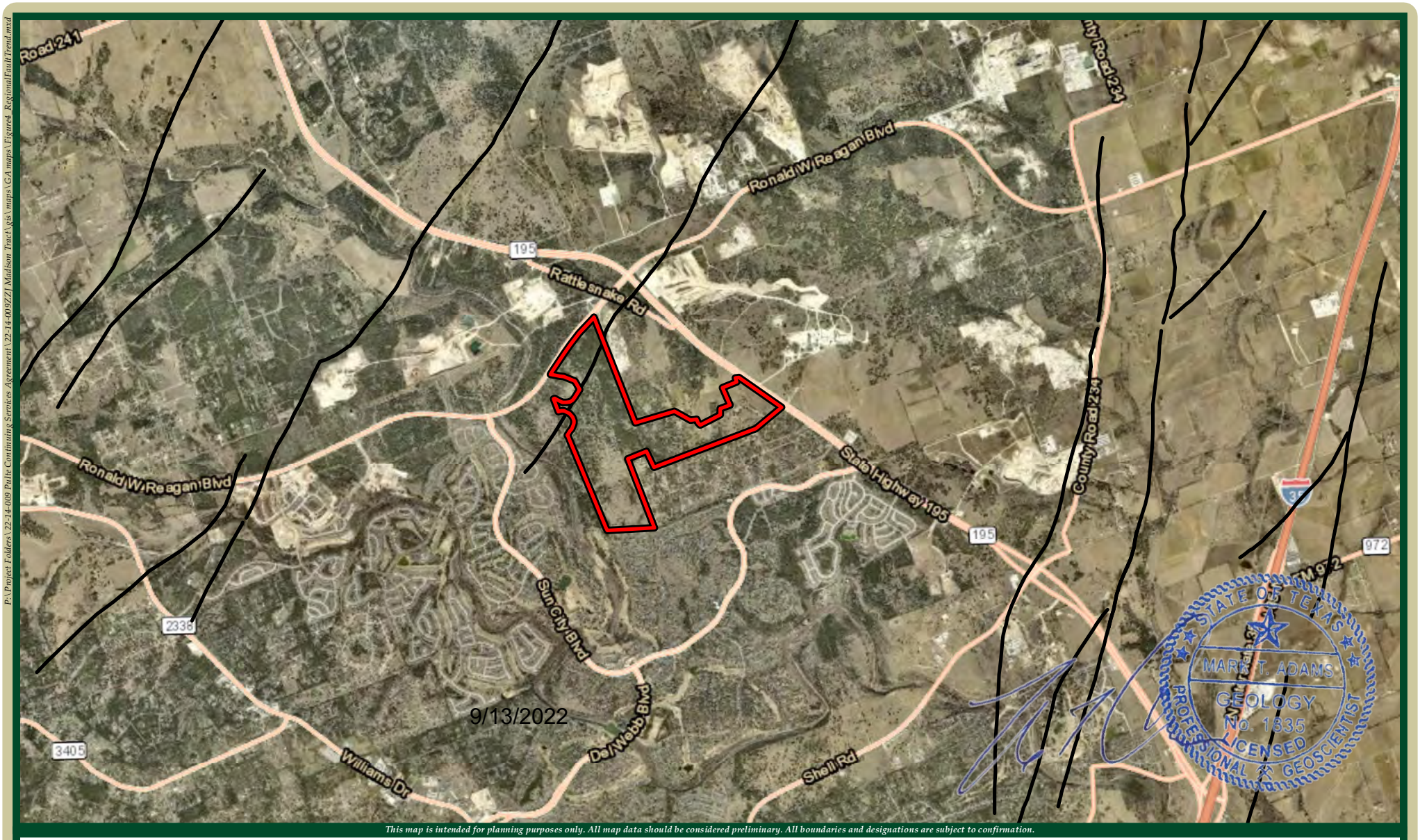


Woodside Tract

aci Project No.: 22-22-138

Figure 3: Site Geologic Map

September 2022



P:\Project Folders\22-14-009 Pulte Continuing Services Agreement\22-14-0092[] Madison Tract\gis\maps\GA maps\Figure4_RegionalFaultTrend.mxd

Woodside Tract **aci Project No.: 22-22-138**

Figure 4: Regional Fault Trend **September 2022**

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ATTACHMENT B

Geologic Table
Geologic and Manmade Feature Map (Figures 5-1, 5-2, & 5-3)
Feature Descriptions and Recommendations

GEOLOGIC ASSESSMENT TABLE — PROJECT NAME: Woodside Tract

LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
M-01	30.7402667	-97.718621	CD	5	Ked/Kgt	3	2	0.5	-		-	-	O,V	10	15	X		X		Hillside
M-02	30.7390629	-97.714590	O	5	Kgt	1.5	2	0.5	-		-	-	O	8	13	X		X		Hillside
M-04	30.741945	-97.721155	C	30	Kgt	8	2.5	6	270		-	2	N	20	50		X	X		Hillside
MMB-01	30.7416919	-97.709858	MB	30	Kgt	3	3	?	-		-	-	X	10	40		X	X		Hillside
MMB-02	30.7428615	-97.707668	MB	30	Kgt	2	2	?	-		-	-	X	10	40		X	X		Hillside
MMB-03	30.7427679	-97.707410	MB	30	Kgt	2	2	?	-		-	-	X	10	40		X	X		Hillside
MMB-04	30.7428922	-97.707494	MB	30	Kgt	6	4	?	-		-	-	X	10	40		X	X		Hillside
MMB-05	30.7426622	-97.707333	MB	30	Kgt	2	2	?	-		-	-	X	10	40		X	X		Hillside

* DATUM: NAD 1983 State Plane 4203

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY

Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field.

My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Date 9/12/2022

Sheet __1___ of __1____

STATE OF TEXAS
MARK T. ADAMS
GEOLOGY
No. 1835
LICENSED
PROFESSIONAL GEOSCIENTIST

9/13/2022

TCEQ-0585-Table (Rev. 10-01-04)

Flood Hazard Zones

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee
- Area with Risk Due to Levee

Kgt

Ked

M-04

Zone AE

N

100 50 0 100 Feet

1:1,200 1 inch = 100 Feet

- Subject Area (~510.5 acres)
- M-04
- M-04 50-ft Buffer

Geologic Rock Units
- Ked
- Kgt

Fault
- Inferred Normal

NHD Flowlines
- StreamRiver

The entire subject area is within the Edwards Aquifer Recharge Zone.

The remaining subject area continues on the next map.

STATE OF TEXAS
MARK T. ADAMS
GEOLOGY
No. 1835
LICENSED
PROFESSIONAL GEOSCIENTIST

9/13/2022

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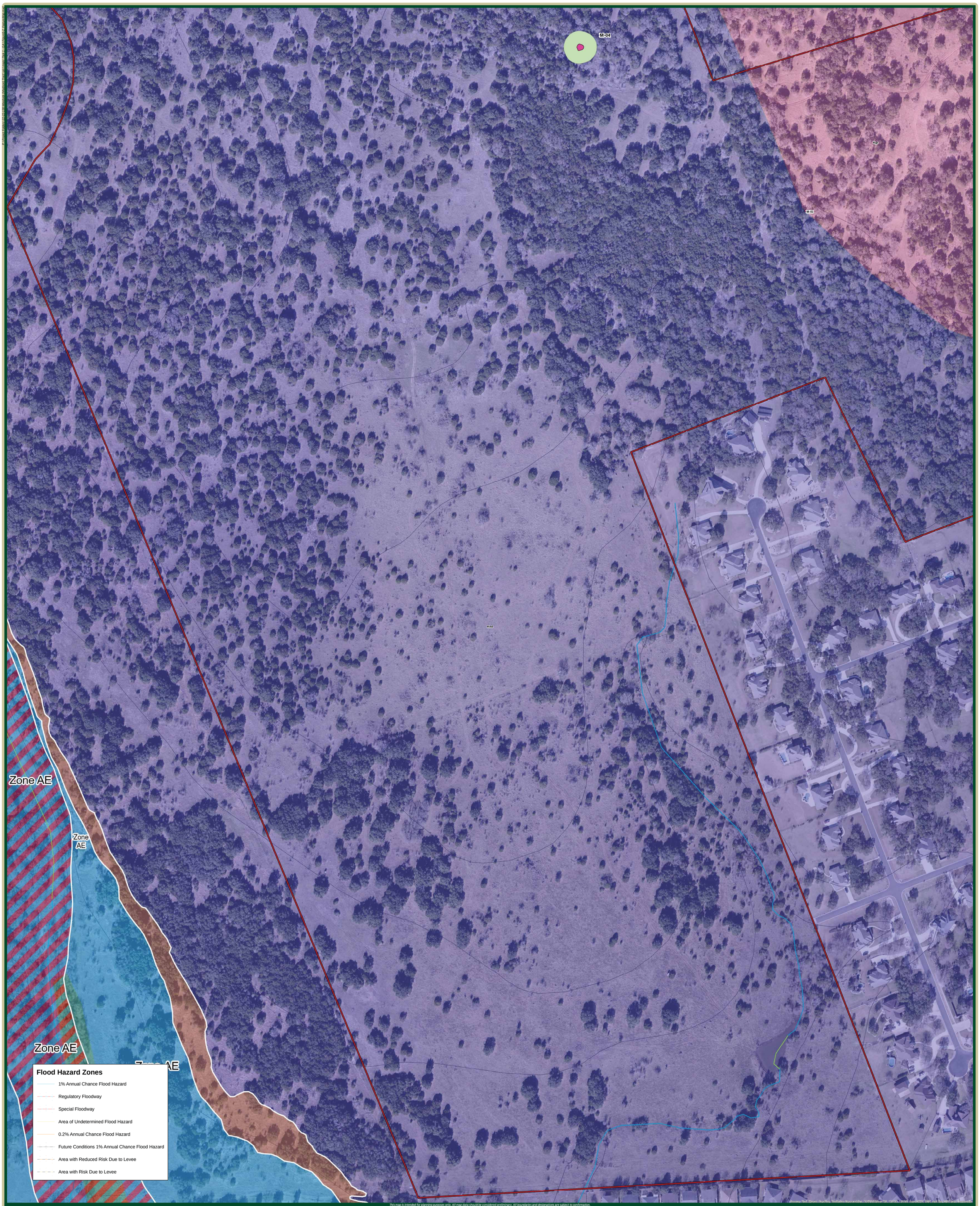
Woodside Tract

Figure 5-1: Feature Map

aci Project No.: 22-22-138

September 2022



100 50 0 100 Feet

1:1,200 1 inch = 100 Feet

Subject Area (~510.5 acres)

aci Features (2021)

M-04

M-04 50-ft Buffer

Geologic Rock Units

Ked

Kgt

Qt

NHD Flowlines

ArtificialPath

StreamRiver

The entire subject area is within the Edwards Aquifer Recharge Zone.

The remaining subject area continues on the next map.

STATE OF TEXAS
MARK T. ADAMS
GEOLOGY
No. 1835
LICENSED
PROFESSIONAL GEOSCIENTIST

9/13/2022

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Woodside Tract

Figure 5-2: Feature Map

aci Project No.: 22-22-138

September 2022

Flood Hazard Zones

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee
- Area with Risk Due to Levee

MMB-01
MMB-02
MMB-03
MMB-04
MMB-05
M-01
M-02
Ked
Kgt

This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.

100 50 0 100 Feet

1:1,200 1 inch = 100 Feet

Subject Area (~510.5 acres)

aci Features (2021)

Geologic Rock Units

Ked

Kgt

NHD Flowlines

StreamRiver

The entire subject area is within the Edwards Aquifer REcharge Zone.

The remaining subject area continues on the previous maps.

STATE OF TEXAS
MARK T. ADAMS
GEOLOGY
No. 1830
LICENSED PROFESSIONAL GEOLOGIST

9/13/2022

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Woodside Tract

Figure 5-3: Feature Map

aci Project No.: 22-22-138

September 2022

M-01
GPS: 30.740266, -97.718621

This feature is a closed depression, located on a gently sloping hillside. This feature was located at the contact between the Edwards Limestone and Georgetown Formations. The approximate dimensions of the depression are 3 feet long by 2 feet wide by 0.5 feet deep. Light hand excavation was performed to identify any apertures within the depression, none of which were observed. It was noted that the interior of the feature is not rock lined, rather the infill material consisted of loose soils and organics such as leaves, sticks, and roots. Several small shrubs were observed near the feature suggesting the possibility of a root heave among the limestone float rocks within the depression. The catchment area is less than 1.6 acres and the probability of rapid infiltration was determined to be low and assigned a point value of 10. The feature was determined to be non-sensitive.

Recommendation: No protections required.

M-01 (view showing depression).

M-01 (top view showing center of feature).

M-02
GPS: 30.739062, -97.714590

This feature is a 'other natural bedrock feature', a fractured epikarst float rock located on a gently sloping hillside in the Georgetown Formation. This feature was observed within a minor depression approximately 3 feet in diameter. Light hand excavation was performed to assess the extent of this feature and if any portals were present within the depression. After light hand excavation, a fractured float rock was observed. The dimensions of this feature were 1.5 feet by 2 feet by 0.5 foot deep. There were no apertures observed after excavation and the feature is not rock lined. Infill material consists of dark soils and loose organics. The drainage area is less than 1.6 acres and the probability of rapid infiltration was designated as low, with a point value of 8. The feature was determined to be non-sensitive.

Recommendation: No protections required.

M-02.

M-04

GPS: 30.741945 -97.721155

M-04 is a cave located on a gently sloping hillside in the Edwards Limestone Formation. The aperture of the cave is roughly a keyhole shape trending at 275°, with a width ranging between 0.5 feet and 2.5 feet. The dimensions of this feature are approximately 8 feet long by 2.5 feet wide by 6 feet deep. The subsurface extent, if any, of this feature was not explored during at the time of this assessment. The approximate diameter of the sink surrounding the feature is 11 feet. This feature was rock lined with small amounts of loose-leaf organics in the interior. There was vegetation present around the perimeter of the feature, however it was not determined if there was any biological activity present within the cave. There was no air flow or water flow observed within the aperture of the cave. The catchment area was determined to be less than 1.6 acres, thus, the relative infiltration rate was determined to be intermediate and assigned a point value of 20

Recommendation: Recommended 50ft setback around the perimeter of the sink. (See **Figure 5-2**).

M-04 (View of depression)

MMB-01
GPS: 30.741691, -97.709857

This feature is a 'manmade feature in bedrock', a well, located on a gently sloping hillside in the Georgetown Limestone Formation. The dimensions of this well are 0.5 foot wide and extends below the surface for an unknown depth. The drainage of this feature was less than 1.6 acres and the probability of rapid infiltration has been designated as low (10 pts). As this feature is a manmade feature in bedrock, it has been designated as sensitive to call the attention of the engineer.

Recommendation: Notify engineer for proper handling.

MMB-01.

MMB-02
GPS: 30.742861, -97.707667

This feature is a 'manmade feature in bedrock', a well, located on a gently sloping hillside in the Georgetown Limestone Formation. The dimensions of this well are 0.2 foot wide and extends below the surface for an unknown depth. The drainage of this feature was less than 1.6 acres and the probability of rapid infiltration has been designated as low (10 pts). As this feature is a manmade feature in bedrock, it has been designated as sensitive to call the attention of the engineer.

Recommendation: Notify engineer for proper handling.

MMB-02.

MMB-03
GPS: 30.742767, -97.707409

This feature is a 'manmade feature in bedrock', a potential septic tank, located on a gently sloping hillside in the Georgetown Limestone Formation. The above ground dimensions of this tank are approximately 4 feet in diameter and extends below the surface for an unknown depth. The below ground dimensions of the tank itself were not determined. The drainage of this feature was less than 1.6 acres and the probability of rapid infiltration has been designated as low (10 pts). As this feature is a manmade feature in bedrock, it has been designated as sensitive to call the attention of the engineer.

Recommendation: Notify engineer for proper handling.

MMB-03.

MMB-04
GPS: 30.74289, -97.707494

This feature is a 'manmade feature in bedrock', a potential septic tank, located on a gently sloping hillside in the Georgetown Limestone Formation. The above ground dimensions of this tank are approximately 6 feet by 4 feet and extends below the surface for an unknown depth. The below ground dimensions of the tank itself were not determined. The drainage of this feature was less than 1.6 acres, and the probability of rapid infiltration has been designated as low (10 pts). As this feature is a manmade feature in bedrock, it has been designated as sensitive to call the attention of the engineer.

Recommendation: Notify engineer for proper handling.

MMB-04

MMB-05
GPS: 30.742662, -97.707332

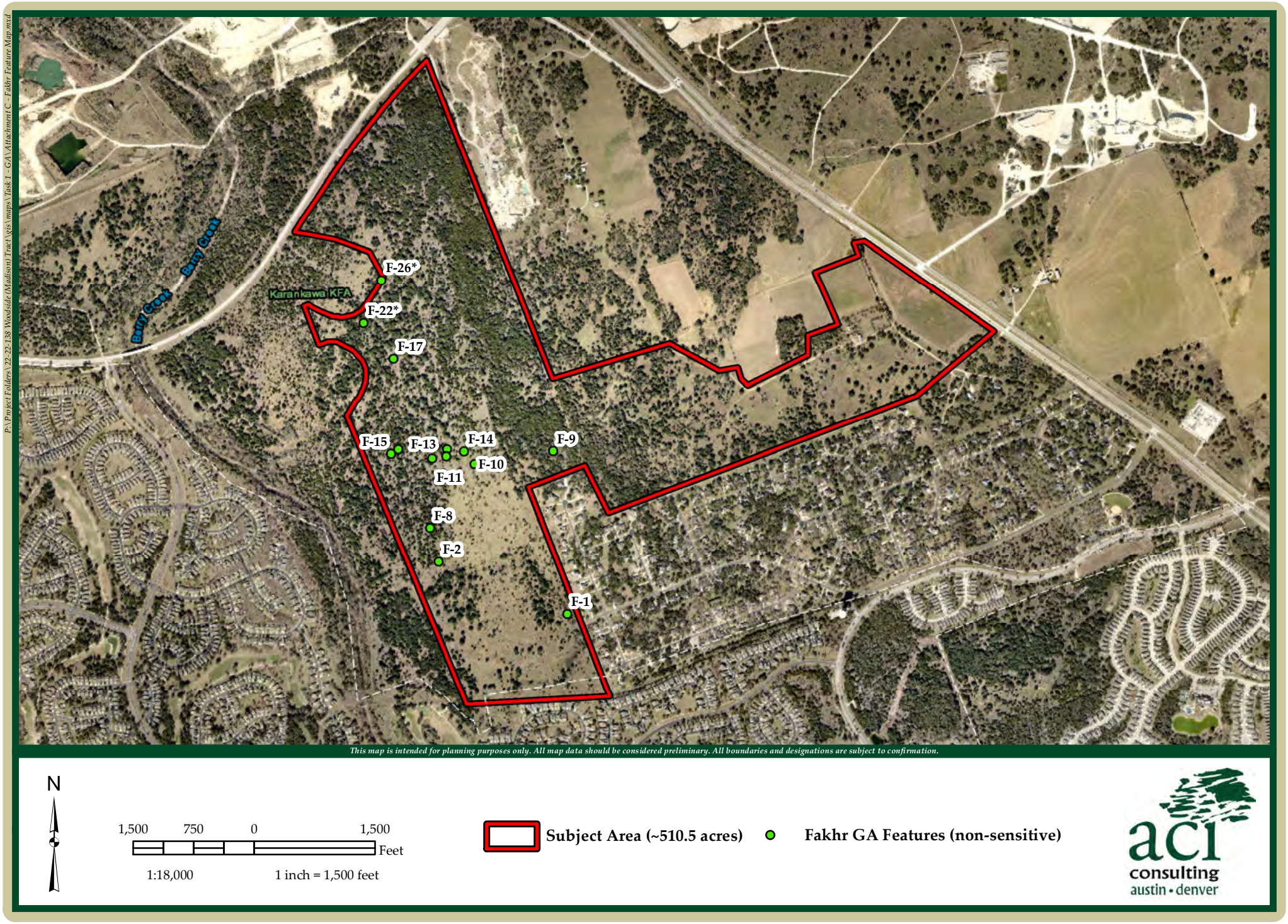
This feature is a 'manmade feature in bedrock', a potential septic tank, located on a gently sloping hillside in the Georgetown Limestone Formation. The above ground dimensions of this tank are approximately 4 feet in diameter and extends below the surface for an unknown depth. The below ground dimensions of the tank itself were not determined. The drainage of this feature was less than 1.6 acres and the probability of rapid infiltration has been designated as low (10 pts). As this feature is a manmade feature in bedrock, it has been designated as sensitive to call the attention of the engineer.

Recommendation: Notify engineer for proper handling.

MMB-05.

ATTACHMENT C

Karst Feature Assessment Map (2006)
aci consulting
2006



Woodside Tract

aci Project No.: 22-22-138

Attachment C - Karst Feature Assessment Map (2006)

September 2022

ATTACHMENT D

Historic Aerials

Prepared for:

ACI CONSULTING
1001 Mopac Circle
Austin, TX 78746

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Historical Aerial Photographs

Madison Tract

TX

Williamson County

PO #: 22-14-009ZZJ

ES-135955

Friday, March 19, 2021

Date: 2020
Source: USDA

0 500 1,000 2,000 Feet

BANKS
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Date: 2016
Source: USDA

0 500 1,000 2,000 Feet

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 2010
Source: USDA

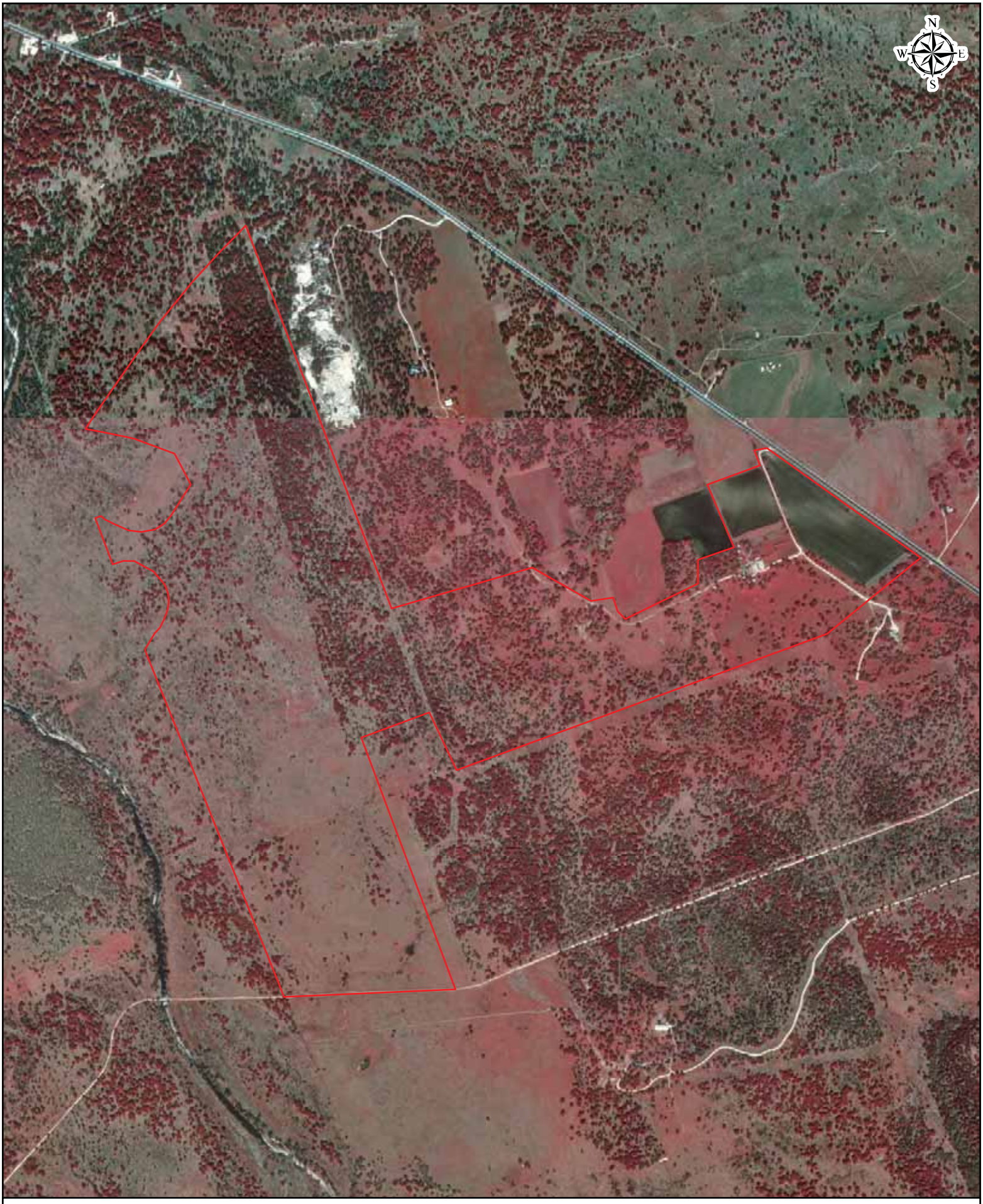
0 500 1,000 2,000 Feet

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 2004
Source: USDA

0 500 1,000 2,000 Feet

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP



Date: 1995
Source: USGS

0 500 1,000 2,000 Feet

BANKS
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Date: 1990
Source: USGS

0 500 1,000 2,000 Feet

BANKS
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Date: 1981
Source: USGS

0 500 1,000 2,000 Feet

BANKS
ENVIRONMENTAL DATA
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Date: 1974
Source: USGS

0 500 1,000 2,000 Feet

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 1964
Source: Fairchild

0 500 1,000 2,000 Feet

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 1953
Source: AMS

0 500 1,000 2,000 Feet

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 1941
Source: ASCS

0 500 1,000 2,000 Feet

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

AERIAL SOURCE DEFINITIONS

Acronym	Agency
NASA	National Aeronautics & Space Administration
AMS	Army Mapping Service
ASCS	Agricultural Stabilization & Conservation Service
SCS	Soil Conservation Service
USBR	United States Bureau of Reclamation
Fairchild	Fairchild Aerial Surveys
TXDOT	Texas Department of Transportation
BLM	Bureau of Land Management
USAF	United States Air Force
USCOE	United States Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WALLACE	Wallace-Zingery Aerial Surveys
TNRIS	Texas Natural Resources Information System

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Water Pollution Abatement Plan Application

Texas Commission on Environmental Quality

For Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

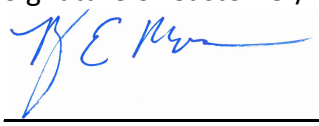
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Water Pollution Abatement Plan Application Form** is hereby submitted for TCEQ review and Executive Director approval. The form was prepared by:

Print Name of Customer/Agent: MK Woodside Development, Inc. / Steger Bizzell, Bryan Moore, P.E.

Date: 8/18/2023

Signature of Customer/Agent:



Regulated Entity Name: Woodside West - Phases A & E

Regulated Entity Information

1. The type of project is:

   - [x] Residential: Number of Lots: 108
   - [ ] Residential: Number of Living Unit Equivalents:_____
   - [ ] Commercial
   - [ ] Industrial
   - [ ] Other:_____

2. Total site acreage (size of property): 71.26

3. Estimated projected population: 270

4. The amount and type of impervious cover expected after construction are shown below:

Table 1 – Impervious Cover Table

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	459,323.0	÷ 43,560 =	10.54
Parking	0.0	÷ 43,560 =	0.0
Other paved surfaces	520,251.0	÷ 43,560 =	11.94
Total Impervious Cover	979,574.0	÷ 43,560 =	22.49

Total Impervious Cover 22.49 **÷ Total Acreage** 71.26 **X 100 =** 31.56**% Impervious Cover**

5. ☒ **Attachment A - Factors Affecting Surface Water Quality**. A detailed description of all factors that could affect surface water and groundwater quality that addresses ultimate land use is attached.

6. ☒ Only inert materials as defined by 30 TAC §330.2 will be used as fill material.

For Road Projects Only

Complete questions 7 - 12 if this application is exclusively for a road project.

7. Type of project:

   ☐ TXDOT road project.
   ☐ County road or roads built to county specifications.
   ☐ City thoroughfare or roads to be dedicated to a municipality.
   ☐ Street or road providing access to private driveways.

8. Type of pavement or road surface to be used:

   ☐ Concrete
   ☐ Asphaltic concrete pavement
   ☐ Other: _____

9. Length of Right of Way (R.O.W.): _____ feet.

   Width of R.O.W.: _____ feet.
   L x W = _____ Ft^2 ÷ 43,560 Ft^2/Acre = _____ acres.

10. Length of pavement area: _____ feet.

    Width of pavement area: _____ feet.
    L x W = _____ Ft^2 ÷ 43,560 Ft^2/Acre = _____ acres.
    Pavement area _____ acres ÷ R.O.W. area _____ acres x 100 = _____% impervious cover.

11. ☐ A rest stop will be included in this project.

☐ A rest stop will not be included in this project.

12. ☐ Maintenance and repair of existing roadways that do not require approval from the TCEQ Executive Director. Modifications to existing roadways such as widening roads/adding shoulders totaling more than one-half (1/2) the width of one (1) existing lane require prior approval from the TCEQ.

Stormwater to be generated by the Proposed Project

13. ☒ Attachment B - Volume and Character of Stormwater. A detailed description of the volume (quantity) and character (quality) of the stormwater runoff which is expected to occur from the proposed project is attached. The estimates of stormwater runoff quality and quantity are based on the area and type of impervious cover. Include the runoff coefficient of the site for both pre-construction and post-construction conditions.

Wastewater to be generated by the Proposed Project

14. The character and volume of wastewater is shown below:

100% Domestic	165,559 Gallons/day
_____% Industrial	_____Gallons/day
_____% Commingled	_____Gallons/day

TOTAL gallons/day 165,559

15. Wastewater will be disposed of by:

☐ On-Site Sewage Facility (OSSF/Septic Tank):

☐ **Attachment C - Suitability Letter from Authorized Agent**. An on-site sewage facility will be used to treat and dispose of the wastewater from this site. The appropriate licensing authority's (authorized agent) written approval is attached. It states that the land is suitable for the use of private sewage facilities and will meet or exceed the requirements for on-site sewage facilities as specified under 30 TAC Chapter 285 relating to On-site Sewage Facilities.

☐ Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

☒ Sewage Collection System (Sewer Lines):

☐ Private service laterals from the wastewater generating facilities will be connected to an existing SCS.

☒ Private service laterals from the wastewater generating facilities will be connected to a proposed SCS.

☐ The SCS was previously submitted on_____.

☒ The SCS was submitted with this application.

☐ The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to Executive Director approval.

☒ The sewage collection system will convey the wastewater to the Pecan Branch (name) Treatment Plant. The treatment facility is:
- ☒ Existing.
- ☐ Proposed.

16. ☒ All private service laterals will be inspected as required in 30 TAC §213.5.

Site Plan Requirements

Items 17 – 28 must be included on the Site Plan.

17. ☒ The Site Plan must have a minimum scale of 1" = 400'.

Site Plan Scale: 1" = 100'.

18. 100-year floodplain boundaries:

☒ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.

☐ No part of the project site is located within the 100-year floodplain.

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): _____

19. ☒ The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Lots, recreation centers, buildings, roads, open space, etc. are shown on the plan.

☐ The layout of the development is shown with existing contours at appropriate, but not greater than ten-foot intervals. Finished topographic contours will not differ from the existing topographic configuration and are not shown. Lots, recreation centers, buildings, roads, open space, etc. are shown on the site plan.

20. All known wells (oil, water, unplugged, capped and/or abandoned, test holes, etc.):

☐ There are _____ (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply)

- ☐ The wells are not in use and have been properly abandoned.
- ☐ The wells are not in use and will be properly abandoned.
- ☐ The wells are in use and comply with 16 TAC §76.

☒ There are no wells or test holes of any kind known to exist on the project site.

21. Geologic or manmade features which are on the site:

☐ All sensitive geologic or manmade features identified in the Geologic Assessment are shown and labeled.

☒ No sensitive geologic or manmade features were identified in the Geologic Assessment.

☐ **Attachment D - Exception to the Required Geologic Assessment**. A request and justification for an exception to a portion of the Geologic Assessment is attached.

22. ☒ The drainage patterns and approximate slopes anticipated after major grading activities.

23. ☒ Areas of soil disturbance and areas which will not be disturbed.

24. ☒ Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.

25. ☒ Locations where soil stabilization practices are expected to occur.

26. ☐ Surface waters (including wetlands).

    ☒ N/A

27. ☐ Locations where stormwater discharges to surface water or sensitive features are to occur.

    ☒ There will be no discharges to surface water or sensitive features.

28. ☒ Legal boundaries of the site are shown.

Administrative Information

29. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

30. ☒ Any modification of this WPAP will require Executive Director approval, prior to construction, and may require submission of a revised application, with appropriate fees.

Attachment A – Factors Affecting Surface Water Quality

The following factors are anticipated to adversely affect surface water and groundwater quality:

- Disturbance of vegetated areas.
- Leaking oil from parked vehicles.
- Malfunctioning wastewater collection system and spill on site.
- Loss of vegetative ground cover due to inadequate watering or mismanagement.
- Over fertilizing vegetative areas.
- The use of roads by automotive traffic and subsequent oil/grease pollutants from normal use.
- The accidental or improper discharge of the following:
    a) Concrete
    b) Cleaning solvents
    c) Detergents
    d) Petroleum based products
    e) Paints
    f) Paint solvents
    g) Acids
    h) Concrete additives

Attachment B – Volume and Character of Storm Water

Existing site conditions are undeveloped ranchland. The proposed Woodside West - Phases A & E is composed of a drainage area which discharges to Berry Creek southeast of the property, as shown in the Berry Creek drainage report. A summary of the drainage calculations is below and is also included in the Woodside West - Phases A & E Construction Plans included with this submittal.

The character of the storm water generated by this project is typical of residential development. The stormwater flows across the pavement, then through a stormwater collection system and is directed towards the proposed water quality pond for treatment.

Berry Creek Runoff Calculations – Existing Conditions

EXISTING CONDITION SUBBASIN ELEMENTS								
SUBBASIN	AREA [SQ MI]	CN	LAG [MIN]	Q2 [CFS]	Q10 [CFS]	Q25 [CFS]	Q100 [CFS]	DOWNSTREAM
A	55.80078125	80.0	235.41	6687.4	15864.17	21852.75	30690.46	R-1
A-1	.09540625	87.2	13.995	144.7	250.13	312.65	404.76	R-1
B	.303125	84.5	20.57	318.74	606.2	781.75	1035.3	J-1
C-1	.08890625	80.0	15.06	90.43	182.73	238.7	323.26	R_C1-C2
C-2A	.054375	80.0	21.71	50.89	105.46	138.87	189.2	R_C2A-C2B
C-2B	.03745313	80.0	13.72	38.08	77.89	101.95	138.95	J-C2
C-2C	.04217188	80.0	11.21	47.33	95.41	124.02	168.89	J-C2
C-3A	.0361875	80.0	14.89	33.92	70.29	92.55	126.1	R_C3A-C3B
C-3B	.08003125	80.0	18.69	68.62	143.78	190.45	259.82	J-C3
C-3C	.03898438	80.0	14.26	40.91	82.23	107.17	145.03	J-C3
C-4A	.05154688	80.0	12.65	90.81	148.99	183.44	234.61	J-C4
C4-B	.06579688	80.0	13.24	68.16	139.09	181.81	247.5	J-C4
D	.11645313	82.88	22.61	105.55	209.68	274.03	367.34	J-1
E	.3141875	84.5	27.99	271.89	529.61	689.12	917.29	J-2
F	.19184375	80.0	19.52	212.01	406.42	524.11	697.1	J-2
G	.6435	83.14	30.55	486.79	982.43	1293.17	1739.24	J-3
G-1	.06917188	80.0	15.58	74.49	151.09	196.96	268.12	R_G1-G2
G-2	.13353125	80.0	40.002	126.15	261.03	343.52	468.15	J-G2
G-3A	.04140625	80.0	11.2	46.5	93.72	121.83	165.92	J-G3
G-3B	.0138125	80.0	10.97	23.32	41.18	51.61	67.8	J-G3
G-4A	.027	80.0	15.08	26.1	53.84	70.73	96.33	J-G4
G-4B	.15692188	83.7	22.79	138.12	271.78	354.55	473.57	J-G4
G-4C	.08151563	80	15.74	77.02	159.37	209.73	285.82	POI-G4
G-5A	.04626563	80.0	12.33	49.67	100.81	131.43	178.87	J-G5
G-5C	.1503125	89.55	44.6	199.29	341.39	426.97	548.03	J-G5
H	10.79682813	82.3	79.16	3969.51	8672.89	11669.6	16017.65	J-3
I	3.73673438	82.7	73.18	1449.35	3132.31	4202.32	5750.76	J-4
J	1.62089063	84.5	33.7	1237.23	2440.67	3192.7	4264.07	R_J-K
K	.8356875	84.82	29.99	780.59	1499.6	1941.94	2575.29	J-4
K-1	.06257813	80.0	16.31	57.99	120.22	158.45	216.06	R_K1_K2
K-2	.12379688	80.0	14.34	122.92	252.58	331.16	451.02	POI-K2
K-4	.1555625	82.57	19.87	149.84	296.89	387.19	519.13	J-4
K-5	.08782813	82.65	14.99	99.89	192.87	248.83	332.79	J-4
L	.20442188	86.5	22.8	224.51	412.29	526.51	689.32	J-4

Berry Creek Runoff Calculations – Developed Site

PROPOSED CONDITION SUBBASIN ELEMENTS								
SUBBASIN	AREA [SQ MI]	CN	LAG [MIN]	Q2 [CFS]	Q10 [CFS]	Q25 [CFS]	Q100 [CFS]	DOWNSTREAM
A	55.80078125	80.0	235.41	6687.4	15864.17	21852.75	30690.46	R-1
A-1	.09540625	87.2	13.995	144.7	250.13	312.65	404.76	R-1
B	.303125	84.5	20.57	318.74	606.2	781.75	1035.3	J-1
C-1	.08890625	80.83	15.46	81.68	167.27	220.08	298.52	R_C1-C2
C-2A	.054375	80.0	21.71	50.89	105.46	138.87	189.2	R_C2A-C2B
C-2B	.02892188	89.24	15.66	45.58	76.27	94.61	121.18	J-C2
C-2C	.04217188	87.88	11.31	84.41	136.85	167.92	215.64	J-C2
C-3A	.0361875	80.0	14.89	33.92	70.29	92.55	126.1	R_C3A-C3B
C-3B	.08770313	88.29	19.52	165.63	270.73	332.4	427.03	
C-3C	.03898438	80.84	13.44	42.2	84.41	109.76	148.45	J-C3
C-4A	.05517188	89.08	15.02	98.21	161.18	198.34	253.48	J-C4
C4-B	.06579688	80.05	12.31	70.92	143.72	187.31	254.84	J-C4
D	.11590625	84.01	22.62	111.9	216.85	281.31	374.25	J-1
E	.3141875	84.5	27.99	271.89	529.61	689.12	917.29	J-2
F	.15021875	84.83	17.61	178.49	332.09	424.71	560.06	J-2
F-1	.0445625	90.73	10.62	91.98	143.64	174.21	220.29	R_F1-F
G	.6435	83.14	30.55	486.79	982.43	1293.17	1739.24	J-3
G-1	.06917188	80.0	15.58	74.49	151.09	196.96	268.12	R_G1-G2
G-2	.176875	89.65	20.58	321.44	521.74	640.22	815.7	POND G
G-3A	.03284375	88.72	12.77	56.28	93.32	115.25	147.9	J-G3
G-3B	.01395313	84.0	10.97	22.84	41.73	52.82	69.93	J-G3
G-4A	.028	88.37	19.65	46.11	77.42	95.95	123.33	J-G4
G-4B	.15692188	83.7	22.79	138.12	271.78	354.55	473.57	J-G4
G-4C	.01028125	86.41	13.27	18.39	31.08	38.5	50.02	POI-G4
G-5A	.02059375	89.09	12.66	36.1	59.35	73.12	93.57	J-G5
G-5B	.02820313	80.4	14.34	32.82	65.75	85.24	115.96	J-G5
G-5C	.1503125	89.55	44.6	199.29	341.39	426.97	548.03	J-G5
H	10.79682813	82.3	79.16	3969.51	8672.89	11669.6	16017.65	J-3
I	3.73673438	82.7	73.18	1449.35	3132.31	4202.32	5750.76	J-4
J	1.62089063	84.5	33.7	1237.23	2440.67	3192.7	4264.07	R_J-K
K	.8356875	84.82	29.99	780.59	1499.6	1941.94	2575.29	J-4
K-1	.06257813	80.0	16.31	57.99	120.22	158.45	216.06	R_K1_K2
K-2	.12896875	90.82	18.9	196.98	324.61	401.32	510.0	POND K
K-3	.0185	83.54	12.16	21.8	41.34	53.08	70.51	POI-K2
K-4	.1555625	82.57	19.87	149.84	296.89	387.19	519.13	J-4
K-5	.08782813	82.65	14.99	99.89	192.87	248.83	332.79	J-4
L	.20442188	86.5	22.8	224.51	412.29	526.51	689.32	J-4

Please see attached water quality plans within the plan set.

Organized Sewage Collection System Application

Texas Commission on Environmental Quality

For Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(c), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Regulated Entity Name: Woodside West - Phases A & E

1. ☒ **Attachment A – SCS Engineering Design Report**. This Engineering Design Report is provided to fulfill the requirements of 30 TAC Chapter 217, including 217.10 of Subchapter A, §§217.51 – 217.70 of Subchapter C, and Subchapter D as applicable, and is required to be submitted with this SCS Application Form.

Customer Information

2. The entity and contact person responsible for providing the required engineering certification of testing for this sewage collection system upon completion (including private service connections) and every five years thereafter to the appropriate TCEQ region office pursuant to 30 TAC §213.5(c) is:

   Contact Person: Blake Magee
   Entity: MK Woodside Development, Inc.
   Mailing Address: 1011 North Lamar
   City, State: Austin, TX Zip: 78703
   Telephone: (512) 481-0303 Fax: N/A
   Email Address: blake@blakemageeco.com
   The appropriate regional office must be informed of any changes in this information within 30 days of the change.

3. The engineer responsible for the design of this sewage collection system is:

   Contact Person: Mr. Bryan E. Moore, P.E.
   Texas Licensed Professional Engineer's Number: 98920
   Entity: Steger Bizzell
   Mailing Address: 1978 S. Austin Ave
   City, State: Georgetown, TX Zip: 78626
   Telephone: (512) 930-9412 Fax: n/a
   Email Address:bmoore@stegerbizzell.com

Project Information

4. Anticipated type of development to be served (estimated future population to be served, plus adequate allowance for institutional and commercial flows):

   ☒ Residential: Number of single-family lots: 108
   ☐ Multi-family: Number of residential units: _____
   ☐ Commercial
   ☐ Industrial
   ☐ Off-site system (not associated with any development)
   ☐ Other: _____

5. The character and volume of wastewater is shown below:

100 % Domestic	165,559 gallons/day
_____% Industrial	_____ gallons/day
_____% Commingled	_____ gallons/day

   Total gallons/day: 165,559

6. Existing and anticipated infiltration/inflow is 49,000 gallons/day. This will be addressed by: The project is all new construction with PVC pipe serving the new development.

7. A Water Pollution Abatement Plan (WPAP) is required for construction of any associated commercial, industrial or residential project located on the Recharge Zone.

   ☐ The WPAP application for this development was approved by letter dated _____. A copy of the approval letter is attached.
   ☒ The WPAP application for this development was submitted to the TCEQ on 8/18/2023, but has not been approved.
   ☐ A WPAP application is required for an associated project, but it has not been submitted.
   ☐ There is no associated project requiring a WPAP application.

8. Pipe description:

Table 1 – Pipe Description

Pipe Diameter(Inches)	*Linear Feet (1)*	*Pipe Material (2)*	*Specifications (3)*
6	1075	PVC SDR-26	ASTM D 3034
8	3942	PVC SDR-26	ASTM D 3034
8	200	PVC DR-18	ASTM D 1784

Total Linear Feet: 5,217

(1) Linear feet - Include stub-outs and double service connections. Do not include private service laterals.
(2) Pipe Material - If PVC, state SDR value.
(3) Specifications - ASTM / ANSI / AWWA specification and class numbers should be included.

9. The sewage collection system will convey the wastewater to the Pecan Branch (name) Treatment Plant. The treatment facility is:

   ☒ Existing
   ☐ Proposed

10. All components of this sewage collection system will comply with:

   ☒ The City of Georgetown standard specifications.
   ☐ Other. Specifications are attached.

11. ☒ No force main(s) and/or lift station(s) are associated with this sewage collection system.

   ☐ A force main(s) and/or lift station(s) is associated with this sewage collection system and the **Lift Station/Force Main System Application** form (TCEQ-0624) is included with this application.

Alignment

12. ☒ There are no deviations from uniform grade in this sewage collection system without manholes and with open cut construction.

13. ☒ There are no deviations from straight alignment in this sewage collection system without manholes.

   ☐ **Attachment B - Justification and Calculations for Deviation in Straight Alignment without Manholes**. A justification for deviations from straight alignment in this sewage collection system without manholes with documentation from pipe manufacturer allowing pipe curvature is attached.

   ☐ For curved sewer lines, all curved sewer line notes (TCEQ-0596) are included on the construction plans for the wastewater collection system.

Manholes and Cleanouts

14. ☒ Manholes or clean-outs exist at the end of each sewer line(s). These locations are listed below: (Please attach additional sheet if necessary)

Table 2 – Manholes and Cleanouts

Line	*Shown on Sheet*	*Station*	*Manhole or Clean-out?*
See Attachment B	Of		
	Of		
	Of		
	Of		
	Of		

15. ☒ Manholes are installed at all Points of Curvature and Points of Termination of a sewer line.

16. ☒ The maximum spacing between manholes on this project for each pipe diameter is no greater than:

Pipe Diameter (inches)	Max. Manhole Spacing (feet)
6 - 15	500
16 - 30	800
36 - 48	1000
≥54	200

☐ **Attachment C – Justification for Variance from Maximum Manhole Spacing**. The maximum spacing between manholes on this project (for each pipe diameter used) is greater than listed in the table above. A justification for any variance from the maximum spacing is attached, and must include a letter from the entity which will operate and maintain the system stating that it has the capability to maintain lines with manhole spacing greater than the allowed spacing.

17. ☐ All manholes will be monolithic, cast-in-place concrete.

☒ The use of pre-cast manholes is requested for this project. The manufacturer's specifications and construction drawings, showing the method of sealing the joints, are attached.

Site Plan Requirements

Items 18 - 25 must be included on the Site Plan.

18. ☒ The Site Plan must have a minimum scale of 1" = 400'.

Site Plan Scale: 1" = 100'.

19. ☒ The Site Plan must include the sewage collection system general layout, including manholes with station numbers, and sewer pipe stub outs (if any). Site plan must be overlain by topographic contour lines, using a contour interval of not greater than ten feet and showing the area within both the five-year floodplain and the 100-year floodplain of any drainage way.

20. Lateral stub-outs:

☒ The location of all lateral stub-outs are shown and labeled.
☐ No lateral stub-outs will be installed during the construction of this sewer collection system.

21. Location of existing and proposed water lines:

☒ The entire water distribution system for this project is shown and labeled.
☐ If not shown on the Site Plan, a Utility Plan is provided showing the entire water and sewer systems.
☐ There will be no water lines associated with this project.

22. 100-year floodplain:

☒ After construction is complete, no part of this project will be in or cross a 100-year floodplain, either naturally occurring or manmade. (Do not include streets or concrete-lined channels constructed above of sewer lines.)
☐ After construction is complete, all sections located within the 100-year floodplain will have water-tight manholes. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)

Table 3 – 100-Year Floodplain

Line	*Sheet*	*Station*
N/A	of	to
	of	to
	of	to

23. 5-year floodplain:

☒ After construction is complete, no part of this project will be in or cross a 5-year floodplain, either naturally occurring or man-made. (Do not include streets or concrete-lined channels constructed above sewer lines.)

☐ After construction is complete, all sections located within the 5-year floodplain will be encased in concrete or capped with concrete. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)

Table 4 – 5-Year Floodplain

Line	*Sheet*	*Station*
N/A	of	to
	of	to
	of	to
	of	to

24. ☒ Legal boundaries of the site are shown.

25. ☒ The ***final plans and technical specifications*** are submitted for the TCEQ's review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.

Items 26 - 33 must be included on the Plan and Profile sheets.

26. ☒ All existing or proposed water line crossings and any parallel water lines within 9 feet of sewer lines are listed in the table below. These lines must have the type of pressure rated pipe to be installed shown on the plan and profile sheets. Any request for a variance from the required pressure rated piping at crossings must include a variance approval from 30 TAC Chapter 290.

☐ There will be no water line crossings.

☐ There will be no water lines within 9 feet of proposed sewer lines.

Table 5 – Water Line Crossings

Line	*Station or Closest Point*	*Crossing or Parallel*	*Horizontal Separation Distance*	*Vertical Separation Distance*
See Attached Table				

27. Vented Manholes:

☒ **No part** of this sewer line is within the 100-year floodplain and vented manholes are not required by 30 TAC Chapter 217.

☐ **A portion** of this sewer line is within the 100-year floodplain and vented manholes will be provided at less than 1500 foot intervals. These water-tight manholes are listed in the table below and labeled on the appropriate profile sheets.

☐ **A portion** of this sewer line is within the 100-year floodplain and an alternative means of venting shall be provided at less than 1500 feet intervals. A description of the alternative means is described on the following page.

☐ **A portion** of this sewer line is within the 100-year floodplain; however, there is no interval longer than 1500 feet located within. No vented manholes will be used.

Table 6 – Vented Manholes

Line	*Manhole*	*Station*	*Sheet*
N/A			

28. Drop manholes:

☒ There are no drop manholes associated with this project.

☐ Sewer lines which enter new or existing manholes or "manhole structures" higher than 24 inches above the manhole invert are listed in the table below and labeled on the appropriate profile sheets. These lines meet the requirements of 30 TAC §217.55(l)(2)(H).

Table 7 – Drop Manholes

Line	*Manhole*	*Station*	*Sheet*
N/A			

29. Sewer line stub-outs (For proposed extensions):

☒ The placement and markings of all sewer line stub-outs are shown and labeled.

☐ No sewer line stub-outs are to be installed during the construction of this sewage collection system.

30. Lateral stub-outs (For proposed private service connections):

☒ The placement and markings of all lateral stub-outs are shown and labeled.
☐ No lateral stub-outs are to be installed during the construction of this sewage collection system.

31. Minimum flow velocity (From Appendix A)

☒ Assuming pipes are flowing full; all slopes are designed to produce flows equal to or greater than 2.0 feet per second for this system/line.

32. Maximum flow velocity/slopes (From Appendix A)

☒ Assuming pipes are flowing full, all slopes are designed to produce maximum flows of less than or equal to 10 feet per second for this system/line.
☐ **Attachment D – Calculations for Slopes for Flows Greater Than 10.0 Feet per Second.** Assuming pipes are flowing full, some slopes produce flows which are greater than 10 feet per second. These locations are listed in the table below. Calculations are attached.

Table 8 – Flows Greater Than 10 Feet per Second

Line	*Profile Sheet*	*Station to Station*	*FPS*	*% Slope*	*Erosion/Shock Protection*
N/A					

33. Assuming pipes are flowing full, where flows are ≥ 10 feet per second, the provisions noted below have been made to protect against pipe displacement by erosion and/or shock under 30 TAC §217.53(l)(2)(B).

☐ Concrete encasement shown on appropriate Plan and Profile sheets for the locations listed in the table above.
☐ Steel-reinforced, anchored concrete baffles/retards placed every 50 feet shown on appropriate Plan and Profile sheets for the locations listed in the table above.
☒ N/A

Administrative Information

34. ☒ The final plans and technical specifications are submitted for TCEQ review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.

35. ☒ Standard details are shown on the detail sheets, which are dated, signed, and sealed by the Texas Licensed Professional Engineer, as listed in the table below:

Table 9 – Standard Details

Standard Details	***Shown on Sheet***
Lateral stub-out marking **[Required]**	71 of 93
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) **[Required]**	72 of 83
Alternate method of joining lateral to existing SCS line for potential future connections **[Required]**	71 of 83
Typical trench cross-sections **[Required]**	71 of 83
Bolted manholes **[Required]**	72 of 83
Sewer Service lateral standard details **[Required]**	71 of 83
Clean-out at end of line **[Required, if used]**	N/A of N/A
Baffles or concrete encasement for shock/erosion protection **[Required, if flow velocity of any section of pipe >10 fps]**	N/A of N/A
Detail showing Wastewater Line/Water Line Crossing **[Required, if crossings are proposed]**	71 of 83
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) **[Required, if Flexible Pipe is used]**	71 of 83
Drop manholes **[Required, if a pipe entering a manhole is more than 24 inches above manhole invert]**	72 of 83

36. ☒ All organized sewage collection system general construction notes (TCEQ-0596) are included on the construction plans for this sewage collection system.

37. ☒ All proposed sewer lines will be sufficiently surveyed/staked to allow an assessment prior to TCEQ executive director approval. If the alignments of the proposed sewer lines are not walkable on that date, the application will be deemed incomplete and returned.

    ☒ Survey staking was completed on this date: 09/18/2023

38. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

39. ☒ Any modification of this SCS application will require TCEQ approval, prior to construction, and may require submission of a revised application, with appropriate fees.

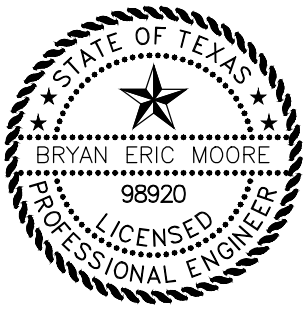
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Organized Sewage Collection System Application** is hereby submitted for TCEQ review and executive director approval. The system was designed in accordance with the requirements of 30 TAC §213.5(c) and 30 TAC §217 and prepared by:

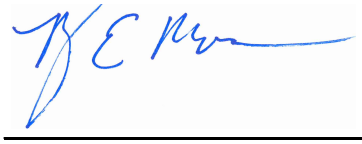
Print Name of Licensed Professional Engineer: Bryan E. Moore, P.E. F-181

Date: 8/18/2023

Place engineer's seal here:



Signature of Licensed Professional Engineer:



Appendix A-Flow Velocity Table

Flow Velocity (Flowing Full) All gravity sewer lines on the Edwards Aquifer Recharge Zone shall be designed and constructed with hydraulic slopes sufficient to give a velocity when flowing full of not less than 2.0 feet per second, and not greater than 10 feet per second. The grades shown in the following table are based on Manning's formula and an n factor of 0.013 and shall be the minimum and maximum acceptable slopes unless provisions are made otherwise.

Table 10 – Slope Velocity

Pipe Diameter(Inches)	*% Slope required for minimum flow velocity of 2.0 fps*	*% Slope which produces flow velocity of 10.0 fps*
6	0.50	12.35
8	0.33	8.40
10	0.25	6.23
12	0.20	4.88
15	0.15	3.62
18	0.11	2.83
21	0.09	2.30
24	0.08	1.93
27	0.06	1.65
30	0.055	1.43
33	0.05	1.26
36	0.045	1.12
39	0.04	1.01
>39	*	*

**For lines larger than 39 inches in diameter, the slope may be determined by Manning's formula (as shown below) to maintain a minimum velocity greater than 2.0 feet per second when flowing full and a maximum velocity less than 10 feet per second when flowing full.*

$$v = \frac{1.49}{n} \times R_h^{0.67} \times \sqrt{S}$$

Figure 1 – Manning's Formula

Where:

v = velocity (ft/sec)
n = Manning's roughness coefficient (0.013)
Rh = hydraulic radius (ft)
S = slope (ft/ft)

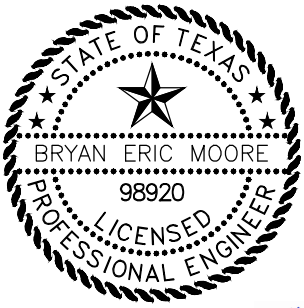
ATTACHMENT A

ENGINEERING DESIGN REPORT

FOR

Woodside West - Phases A & E
Organized Sewage Collection System

Job No. 22226-21-02



Prepared by:

STEGER BIZZELL
F-181
1978 South Austin Ave.
Georgetown, Texas 78626

Engineering Design Report
For a
WASTEWATER COLLECTION SYSTEM
Within
Woodside West - Phases A & E

PURPOSE

The purpose of this report is to demonstrate that the proposed wastewater collection system complies with the Texas Commission on Environmental Quality's Chapter 217 - Design Criteria for Domestic Wastewater Systems. The project includes the construction of wastewater lines to service Woodside West - Phases A & E. Woodside is a high quality residential development located in Georgetown, Texas.

The sewage collection system from Woodside West - Phases A & E will be connected to the existing 24-inch stub along the north side of the property. The existing collection system then travels down to Berry Creek and into the Sun City Lift Station where it ultimately flows to the Pecan Branch WWTP.

The CITY OF GEORGETOWN will own and maintain the sanitary sewer collection system described in this application. The PECAN BRANCH wastewater treatment plant (WWTP) will receive and treat flows from the project. The TCEQ Permit No. is WQ 00104890002. The Permittee is the Pulte Homes of Texas, L.P. The plans will also be reviewed by the City of Georgetown's Development Engineer.

PIPE DESIGN 30 TAC §217.53

Flow design basis (30 TAC §217.53(a))

Flow development for the area is based on the following City of Georgetown design criteria:

Unit Flow:

- Typical Residential = 70 gpcd

Dry Weather Flow (DWF):

- Woodside = 2.5 people/LUE*(70 gpcd+30 gpcd) = 250 gpd/LUE
- Woodside = (250 gpd/LUE * 108 LUE) = 27,000.0 gpd

Woodside West - Phases A & E:
AvgDWF= 27,000 gpd/10^6 = 0.00270 (mgd)
Peak Flow Factor (PF) = 2.8*AvgDWF$^{-0.0732}$ = 4.32
Peak DWF = PF*DWF = 116,559.0 gpd
I/I flows have to be considered as part of flow development. A generally accepted I/I generation rate in the City of Georgetown is 1,000 gallons/acre/day. The total area contributing to infiltration for the Woodside West - Phases A & E portion of the system is 49 acres. Therefore, the flow resulting from I/I would be as follows:

Woodside West - Phases A & E:
49 acres * 1,000 gallons/acre/day = 49,000 gpd

Potential peak flow in the system would be as follows:

Woodside West - Phases A & E:
116,559 gpd + 49,000 gpd = 165,559 gpd or 0.2562 cfs

The wastewater lines in Woodside West - Phases A & E consist of 8-inch pipe within the neighborhood. Further downstream these lines join the existing interceptor.

For the portion of the collection system proposed in this report, which encompasses the Woodside West - Phases A & E phase of development, the proposed minimum slope for 8-inch diameter pipe is 0.50%, and the proposed maximum slope for 8-inch diameter pipe is 4.50%. The required minimum slope for 8-inch diameter pipe is 0.33%, and the required maximum slope is 8.40%. The proposed system meets these requirements.

The pipe full velocity for the 8" pipe at the minimum slope of 0.33% is 2 fps. At the maximum slope of 8.40%, the pipe full velocity is 10.0 fps. The minimum and maximum velocities of the 8-inch pipe in the proposed system are 2.4 fps and 7.3 fps, respectively. Therefore, the wastewater collection system contains slopes sufficient to maintain a minimum velocity of 2.0 feet per second when flowing full, while staying below the maximum pipe full velocity of 10 fps.

Gravity pipe materials (30 TAC §217.53(b)), Joints for gravity pipe (30 TAC §217.53(c))

PIPE	LINEAR FEET	PIPE MATERIAL	NATIONAL SPECIFICATION FOR PIPE MATERIAL	NATIONAL STANDARD FOR PIPE JOINTS
6" Services	1075	PVC SDR-26	ASTM D3034	ASTM D3212
8" Gravity	200	PVC DR-18	ASTM D1784	ASTM D3139
8" Gravity	3942	PVC SDR-26	ASTM D3034	ASTMD3139

Separation distances (30 TAC §217.53(d))
The proposed wastewater collection system complies with the TCEQ Separation Distance requirements for horizontal separation. Where the proposed potable water system cross the proposed collection system the water system will be above the wastewater collection system. The crossings will meet TCEQ criteria for potable water line crossings. DR-18 PVC pipe with a pressure rating of 150 psi will be used for crossings with vertical separations of less than two-feet and greater than six-inches and are labeled on the wastewater plan and profile sheets.

Building laterals and taps (30 TAC §217.53(e))
There are 6" laterals to proposed homes with this project.

Bores (30 TAC §217.53(f))
There are no bores proposed with this project.

Corrosion potential (30 TAC §217.53(g)), Odor control (30 TAC §217.53(h))
PVC SDR26 and DR-18 meeting the requirements of ASTM D3034 and F679 for pipe and ASTM D3212 for pipe joints are proposed for this project. The sewer pipe will handle ordinary domestic sewer.

Active geologic faults (30 TAC §217.53(i))
There are no known active geologic faults within the limits of construction.

Capacity analysis (30 TAC §217.53(j))
The existing downstream collection system consists of 18" and larger pipes. The existing 18" line at the connection point has a minimum grade of 0.15% and a line capacity of 2,636,973 gpd. Confirmation of capacity from the City of Georgetown was included with the submittal package for the SCS approved on January 9, 2015. There is an agreement in place between the City of Georgetown and the developer, which ensures wastewater capacity within the system for the development of the Sun City Tract, including NH 66-92.

Structural analysis (30 TAC §217.53(k))
See Attachment Form 10243 for structural calculations following this report.

Minimum and maximum slopes (30 TAC §217.53(l))
The wastewater collection system contains slopes sufficient to maintain velocities greater than 2.0 feet per second and less than 10.0 feet per second, when flowing full. For 8” diameter pipe, the minimum slope is 0.33%, and the maximum slope is 8.40%. For this system, the proposed minimum slope is 0.50% and the maximum slope is 4.50%.

Alignment (30 TAC §217.53(m))
The proposed wastewater collection system has been designed with uniform grade between manholes. No deviations from straight alignment between manholes are proposed.

Inverted siphons or sag pipes (30 TAC §217.53(n))
There are no inverted siphons or sag pipes proposed with this project.

Bridged sections (30 TAC §217.53(o))
There are no bridged sections proposed with this project.

CRITERIA FOR LAYING PIPE 30 TAC §217.54

Pipe embedment (30 TAC §217.54(a)), Compaction (30 TAC §217.54(b))
Envelope size (30 TAC §217.54(c)), Trench width (30 TAC §217.54(d))

The project will comply with the City of Georgetown's details and specifications for pipe embedment and excavation. The detail is included in the construction plans on Sheets 71 and 72 of the Woodside West - Phases A & E Construction Plan. The bedding compiles with ASTM D-2321 class 1B gravel. The minimum trench width for 8", 12", 15", 18 and 21" pipe is 21", 25", 28", 31" and 35" respectively. The maximum trench width for 8", 12", 15", 18" and 21" pipe is 35", 39", 41", 45 and 48" respectively.

MANHOLES AND RELATED STRUCTURES 30 TAC §217.55

Precast concrete manholes are proposed for this project. A detail for the manhole is included in the construction plans on Sheets 71 and 72. The manholes must meet the requirements of ASTM C-478. Manholes are proposed at the end of the sewer line and at changes in alignment. A detail for the cleanout is included in the construction plans on Sheets 71 and 72 cleanouts proposed. Details for the manhole covers and inverts are included on Sheets 71 and 72.

The manholes have been spaced to comply with Table C.2 of 30 TAC §217.55. The maximum spacing between manholes is 327'.

TRENCHLESS PIPE INSTALLATION 30 TAC §217.54

There is no Trenchless Pipe Installation proposed with this project.

TESTING REQUIREMENTS FOR INSTALLATION OF GRAVITY COLLECTION SYSTEM PIPES 30 TAC §217.57

The testing requirements for Gravity System Pipes are included in the Site Development Plan on Sheet 3.

TESTING REQUIREMENTS FOR MANHOLES 30 TAC §217.58

The following testing requirements are taken from 30 TAC §217.58. The testing requirements are also included in the construction plans on Sheet 3.

All manholes must pass a leakage test. An owner shall test each manhole (after assembly and backfilling) for leakage, separate and independent of the collection system pipes, by hydrostatic exfiltration testing, vacuum testing, or other method approved by the executive director.

Hydrostatic Testing

The maximum leakage for hydrostatic testing or any alternative test methods is 0.025 gallons per foot diameter per foot of manhole depth per hour. To perform a hydrostatic exfiltration test, an owner shall seal all wastewater pipes coming into a manhole with an internal pipe plug, fill the manhole with water and maintain the test for at least one hour. A test for concrete manholes may use a 24 hour wetting period before testing to allow saturation of the concrete.

Vacuum Testing

To perform a vacuum test, an owner shall plug all lift holes and exterior joints with a non-shrink grout and plug all pipes entering a manhole. No grout must be placed in horizontal joints before testing. Stub outs, manhole boots and pipe plugs must be secured to prevent movement while a vacuum is drawn. An owner shall use a minimum 60 inch/lb torque wrench to tighten the external clamps that secure a test cover to the top of a manhole. A test head must be placed at the inside of the top of a cone section and the seal inflated in accordance with the manufacturer's recommendations. There must be a vacuum of 10 inches of mercury inside a manhole to perform a valid test. A test does not begin until after the vacuum pump is off. A manhole passes the test if after 2.0 minutes and with all valves closed, the vacuum is a least 9.0 inches of mercury.

LIFT STATION REQUIREMENTS 30 TAC §217.54

There are no Lift Station or force mains associated with this project.

ATTACHMENT B: Manholes and Cleanouts

Line	*Shown on Sheet*	*Station*	*Manhole or Clean-out?*
WW-A03	65 of 93	0+00.00	Manhole
WW-A03	65 of 93	7+21.66	Ex. Manhole
WW-A04	65 of 93	0+00.00	Manhole
WW-A04	65 of 93	3+03.65	Ex. Manhole
WW-A06	66 of 93	0+00.00	Manhole
WW-A06	66 of 93	7+86.66	Ex. Manhole
WW-07	66 of 93	14+08.93	Ex. Manhole
WW-A11	67 of 93	10+41.52	Manhole
WW-A11	67 of 93	13+41.81	Ex. Manhole
WW-A31	68 of 93	15+33.21	Manhole
WW-A31	68 of 93	19+38.76	Ex. Manhole
WW-A351	69 of 93	14+18.56	Manhole
WW-A351	69 of 93	16+83.87	Manhole
WW-A36	70 of 93	8+59.23	Manhole
WW-A36	70 of 93	17+73.83	Ex. Manhole

Water Line Crossings

LINE	*STA*	*CROSSING OR PARALLEL*	*HORIZONTAL SEPARATION DISTANCE*	*VERTICAL SEPARATION DISTANCE*
WW-A03	6+94.66	CROSSING	n/a	5'
WW-A04	2+76.65	CROSSING	n/a	6'
WW-A06	7+59.65	CROSSING	n/a	4.5'
WW-A31	15+00.21	CROSSING	n/a	2'
WW-A31	19+11.76	CROSSING	n/a	3'
WW-A36	8+26.23	CROSSING	n/a	2'
WW-A36	17+46.83	CROSSING	n/a	11'
WW-A11	10+08.52	CROSSING	n/a	2.4'
WW-A351	11+92.87	CROSSING	n/a	2'
WW-A351	14+01.80	CROSSING	n/a	2.5'

ASTM D3034 PIPE (NOT ASTM D2241)

CHOOSE PIPE SDR AND DIAMETER

SDR = 26

Dia. = 8 "

Wall = 0.323 "

Buckling Analysis

T63) Pressure due to live load

L_l = = 0

T68) Calculate allowable and predicted buckling pressure.

a) Calculate allowable buckling pressure:

$q_a = 0.4*Sqrt(32*R_W*B'*E_b*(E*I/D^3))$ Equation (1)

$R_W = 1-0.33*(h_w/h)$ Equation (2)

$B' = 1/(1+4*e^{-0.065H})$ Equation (3)

$I = (t^3/12)*(inches^4/Linch)$ Equation (4)

q_a = allowable buckling pressure, pounds per square inch (psi)	=	127.18	psi
h = height of soil surface above top of pipe in inches (in)	=	240	"
h_w = height of water surface above top of pipe in inches (in) (groundwater elevation)	=	0	"
R_W = Water buoyancy factor. If h_w = 0, R_w = 1. If 0 < or = hw < or = h (groundwater elevation is between the top of the pipe and the ground surface), calculate Rw with Equation 2	=	1	
H = Depth of burial in feet (ft) from ground surface to crown of pipe.	=	20.00	'
B' = Empirical coefficient of elastic support	=	0.48	
E_b = modulus of soil reaction for the bedding material (psi)	=	3000	psi
E = modulus of elasticity of the pipe material (psi)	=	400000	psi
I = moment of inertia of the pipe wall cross section per linear inch of pipe, $inch^4$/lineal inch = $inch^3$. For solid wall pipe, I can be calculated with equation 4. If the pipe used is not solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer.	=	0.00280819	
t = pipe structural wall thickness (in)	=	0.323	"
D = mean pipe diameter (in)	=	8	"

b) Calculate pressure applied to pipe under installed conditions:

$q_p = Y_w*h_w=R_w*(W_c/D)+L_l$ Equation (5)

$W_c - Y_s*H*(D+t)/144$ Equation (6)

q_p = pressure applied to pipe under installed conditions (psi)	=	18.78	psi
Y_w = 0.0361 pounds per cubic inch (pci), specific weight of water	=	0.0361	pcf
Y_s = specific weight of soil in pounds per cubic foot (pcf)	=	130	pcf
W_c = vertical soil load on the pipe per unit length in pounds per linear inch (lb/in)	=	150.28	lb/in
L_l = Live load as determined in T63	=	0	psi

Wall Crushing

T71) **If no concrete encased flexible pipe is proposed** skip to T73, otherwise:

$H = (24*P_c*A)/(Y_s*D_o)$ Equation (7)

D_o = outside pipe diameter, in.	=	8.646	in.
P_c = compressive stress or hydrostatic design basis (HDB). For typical PVC pipe assume 4,000 psi. For any other pipe material the HDB must be supplied by the pipe manufacturer.	=	4000	psi
A = surface area of the pipe wall, in^2/ft	=	3.876	$in.^2/ft$
Y_s = specific weight of soil in pounds per cubic foot (pcf)	=	130	pcf
H = Depth of burial in feet (ft) from ground surface to crown of pipe.	=	331	ft
24 = conversions and coefficients	=	24	

T81) Determine Pipe Stiffness

$P_s = EI/0.149*r^3$ Equation (10)

E = modulus of elasticity of the pipe material (psi)	=	400000	psi
I = moment of inertia of the pipe wall cross section per linear inch of pipe, inch4/lineal inch = inch3. For solid wall pipe, I can be calculated with equation 4. If the pipe used is not solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer.			
mean pipe diameter (in)	=	0.00280819	in.
r =mean radius (in)	=	4	in.
P_s	=	118	psi

T83) Calculate P_s/SSF ratio

$P_s/SSF = P_s/0.61*zeta*E_b > or = 0.15$ Equation (12)

P_s = Pipe stiffness (psi)	=	118	psi
E_b = modulus of soil reaction for the bedding material (psi) [from T76]	=	3000	psi
zeta = 1.0, or a value calculated with the method in T79	=	1.0	
SSF = soil stiffness factor (0.061*zeta*Eb)	=	183	
P_s/SSF	=	0.64	

T86) Calculate and report predicted deflection.

$DeltaY/D(\%) = (K*(L_p+L_l)*100)/((0.149*P_s)+(0.061*zeta*E_b))$ Equation (13)

$L_p = (Y_s*H)/144$ Equation (14)

Delta Y/D = Predicted % vertical deflection under load	=	0.99	%
DeltaY = Change in vertical pipe diameter under load			
D = Undeflected mean pipe diameter (in)	=	8	in.
K = Bedding angle constant. Assumed to be 0.110 unless otherwise justified.	=	0.110	
Y_s = Unit weight of soil (pcf). Y_s less than 120 pcf must be justified.	=	130	pcf
H = Depth of burial (ft) from ground surface to crown of pipe.	=	20	ft.
L_p =Prism load (psi). If prism load is calculated using Marston's load formula, or other formulas less conservative than the one provided above, the load should be multiplied by a deflection lag factor DL = 1.5 to account for long-term deflection of the pipe as the bedding consolidates.	=	18.06	psi

(P_s from T82; zeta from T80; and E_b from T76)

DR-18 PIPE

CHOOSE PIPE DIAMTER AND WALL THICKNESS

Dia. = 8 "

Wall = 0.503 "

Buckling Analysis

T63) Pressure due to live load

L_l = = 0

T68) Calculate allowable and predicted buckling pressure.

a) Calculate allowable buckling pressure:

$q_a = 0.4*Sqrt(32*R_W*B'*E_b*(E*I/D^3))$ Equation (1)

$R_W = 1-0.33*(h_w/h)$ Equation (2)

$B' = 1/(1+4*e^{-0.065H})$ Equation (3)

$I = (t^3/12)*(inches^4/Linch)$ Equation (4)

q_a = allowable buckling pressure, pounds per square inch (psi)	=	241.95	psi
h = height of soil surface above top of pipe in inches (in)	=	228	"
h_w = height of water surface above top of pipe in inches (in) (groundwater elevation)	=	0	"
R_W = Water buoyancy factor. If h_w = 0, R_w = 1. If 0 < or = hw < or = h (groundwater elevation is between the top of the pipe and the ground surface), calculate Rw with Equation 2	=	1	
H = Depth of burial in feet (ft) from ground surface to crown of pipe.	=	19.00	'
B' = Empirical coefficient of elastic support	=	0.46	
E_b = modulus of soil reaction for the bedding material (psi)	=	3000	psi
E = modulus of elasticity of the pipe material (psi)	=	400000	psi
I = moment of inertia of the pipe wall cross section per linear inch of pipe, $inch^4$/lineal inch = $inch^3$. For solid wall pipe, I can be calculated with equation 4. If the pipe used is not solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer.	=	0.01060529	
t = pipe structural wall thickness (in)	=	0.503	"
D = mean pipe diameter (in)	=	8	"

b) Calculate pressure applied to pipe under installed conditions:

$q_p = Y_w*h_w=R_w*(W_c/D)+L_l$ Equation (5)

$W_c - Y_s*H*(D+t)/144$ Equation (6)

q_p = pressure applied to pipe under installed conditions (psi)	=	18.23	psi
Y_w = 0.0361 pounds per cubic inch (pci), specific weight of water	=	0.0361	pcf
Y_s = specific weight of soil in pounds per cubic foot (pcf)	=	130	pcf
W_c = vertical soil load on the pipe per unit length in pounds per linear inch (lb/in)	=	145.85	lb/in
L_l = Live load as determined in T63	=	0	psi

Wall Crushing

T71) **If no concrete encased flexible pipe is proposed** skip to T73, otherwise:

$H = (24*P_c*A)/(Y_s*D_o)$ Equation (7)

D_o = outside pipe diameter, in.	=	9.006	in.
P_c = compressive stress or hydrostatic design basis (HDB). For typical PVC pipe assume 4,000 psi. For any other pipe material the HDB must be supplied by the pipe manufacturer.	=	4000	psi
A = surface area of the pipe wall, $in.^2/ft$	=	6.036	$in.^2/ft$
Y_s = specific weight of soil in pounds per cubic foot (pcf)	=	130	pcf
H = Depth of burial in feet (ft) from ground surface to crown of pipe.	=	495	ft
24 = conversions and coefficients	=	24	

T81) Determine Pipe Stiffness

$P_s = EI/0.149*r^3$ Equation (10)

E = modulus of elasticity of the pipe material (psi)	=	400000	psi
I = moment of inertia of the pipe wall cross section per linear inch of pipe, inch4/lineal inch = inch3. For solid wall pipe, I can be calculated with equation 4. If the pipe used is not solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer.			
mean pipe diameter (in)	=	0.01060529	in.
r =mean radius (in)	=	4	in.
P_s	=	445	psi

T83) Calculate P_s/SSF ratio

$P_s/SSF = P_s/0.61*zeta*E_b > or = 0.15$ Equation (12)

P_s = Pipe stiffness (psi)	=	445	psi
E_b = modulus of soil reaction for the bedding material (psi) [from T76]	=	3000	psi
zeta = 1.0, or a value calculated with the method in T79	=	1.0	
SSF = soil stiffness factor (0.061*zeta*Eb)	=	183	
P_s/SSF	=	2.43	

T86) Calculate and report predicted deflection.

$DeltaY/D(\%) = (K*(L_p+L_l)*100)/((0.149*P_s)+(0.061*zeta*E_b))$ Equation (13)

$L_p = (Y_s*H)/144$ Equation (14)

Delta Y/D = Predicted % vertical deflection under load	=	0.76	%
DeltaY = Change in vertical pipe diameter under load			
D = Undeflected mean pipe diameter (in)	=	8	in.
K = Bedding angle constant. Assumed to be 0.110 unless otherwise justified.	=	0.110	
Y_s = Unit weight of soil (pcf). Y_s less than 120 pcf must be justified.	=	130	pcf
H = Depth of burial (ft) from ground surface to crown of pipe.	=	19	ft.
L_p =Prism load (psi). If prism load is calculated using Marston's load formula, or other formulas less conservative than the one provided above, the load should be multiplied by a deflection lag factor DL = 1.5 to account for long-term deflection of the pipe as the bedding consolidates.	=	17.15	psi

(P_s from T82; zeta from T80; and E_b from T76)

Temporary Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(A), (B), (D)(I) and (G); Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

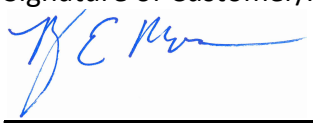
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Temporary Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: MK Woodside Development, Inc. / Steger Bizzell, Bryan Moore, P.E.

Date: 8/18/2023

Signature of Customer/Agent:



Regulated Entity Name: Woodside West - Phases A & E

Project Information

Potential Sources of Contamination

Examples: Fuel storage and use, chemical storage and use, use of asphaltic products, construction vehicles tracking onto public roads, and existing solid waste.

1. Fuels for construction equipment and hazardous substances which will be used during construction:

   ☐ The following fuels and/or hazardous substances will be stored on the site: _____

   These fuels and/or hazardous substances will be stored in:

   ☐ Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons will be stored on the site for less than one (1) year.

☐ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.

☐ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.

☒ Fuels and hazardous substances will not be stored on the site.

2. ☒ **Attachment A - Spill Response Actions**. A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.

3. ☒ Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

4. ☒ **Attachment B - Potential Sources of Contamination**. A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.

Sequence of Construction

5. ☒ **Attachment C - Sequence of Major Activities**. A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.

   ☒ For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.

   ☒ For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

6. ☒ Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project:

Temporary Best Management Practices (TBMPs)

Erosion control examples: tree protection, interceptor swales, level spreaders, outlet stabilization, blankets or matting, mulch, and sod. Sediment control examples: stabilized construction exit, silt fence, filter dikes, rock berms, buffer strips, sediment traps, and sediment basins. Please refer to the Technical Guidance Manual for guidelines and specifications. All structural BMPs must be shown on the site plan.

7. ☒ **Attachment D – Temporary Best Management Practices and Measures**. TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information is attached:

☒ A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.

☒ A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.

☒ A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.

☒ A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

8. ☒ The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.

☐ **Attachment E - Request to Temporarily Seal a Feature**. A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.

☒ There will be no temporary sealing of naturally-occurring sensitive features on the site.

9. ☒ **Attachment F - Structural Practices**. A description of the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site is attached. Placement of structural practices in floodplains has been avoided.

10. ☒ **Attachment G - Drainage Area Map**. A drainage area map supporting the following requirements is attached:

☒ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.

☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.

☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.

☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.

11. ☒ **Attachment H - Temporary Sediment Pond(s) Plans and Calculations**. Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.

    ☐ N/A

12. ☒ **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.

13. ☒ All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14. ☒ If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

15. ☒ Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.

16. ☒ Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

Soil Stabilization Practices

Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.

17. ☒ **Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices**. A schedule of the interim and permanent soil stabilization practices for the site is attached.

18. ☒ Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

19. ☒ Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

Administrative Information

20. ☒ All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.

21. ☒ If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

22. ☒ Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

Attachment A – Spill Response Actions

Because fuels and hazardous substances will be provided by an off-site facility, no on-site containment procedures are provided for in this WPAP.

The objective of this section is to describe measures to prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees. The following steps will help reduce the stormwater impacts of leaks and spills:

Education

1. Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills. Employees should also be aware of when spill must be reported to the TCEQ. Information available in 30 TAC 327.4 and 40 CFR 302.4.
2. Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
3. Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
4. Establish a continuing education program to indoctrinate new employees.
5. Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

1. To the extent that the work can be accomplished safely, spills of oil, petroleum products, and substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
2. Store hazardous materials and wastes in covered containers and protect from vandalism.
3. Place a stockpile of spill cleanup materials where it will be readily accessible.
4. Train employees in spill prevention and cleanup.
5. Designate responsible individuals to oversee and enforce control measures.
6. Spills should be covered and protected from stormwater run-on during rainfall to the extent that it doesn't compromise clean-up activities.
7. Do not bury or wash spills with water.
8. Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
9. Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.
10. Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.

11. Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
12. Keep waste storage areas clean, well-organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

1. Clean up leaks and spills immediately.
2. Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.
3. Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

1. Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
2. Use absorbent materials on small spills rather than hosing down or burying the spill.
3. Absorbent materials should be promptly removed and disposed of properly.
4. Follow the practice below for a minor spill:
5. Contain the spread of the spill.
6. Recover spilled materials.
7. Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.

Spills should be cleaned up immediately:

1. Contain spread of the spill.
2. Notify the project foreman immediately.
3. If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
4. If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
5. If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:

1. Notify the TCEQ by telephone as soon as possible and within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the

Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.

2. For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110, 119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
3. Notification should first be made by telephone and followed up with a written report.
4. The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
5. Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

More information on spill rules and appropriate responses is available on the TCEQ website at: http://www.tceq.texas.gov/response/

Vehicle and Equipment Maintenance

1. If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the run-on of stormwater and the runoff of spills.
2. Regularly inspect onsite vehicles and equipment for leaks and repair immediately.
3. Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
4. Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
5. Place drip pans or absorbent materials under paving equipment when not in use.
6. Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
7. Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
8. Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
9. Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

1. If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the run-on of stormwater and the runoff of spills.
2. Discourage "topping off" of fuel tanks.
3. Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

If a spill should occur, the person responsible for the spill should contact the TCEQ at (512) 339-2929 or call 911. Soil contaminated by spills that occur on-site will be removed and disposed at an approved disposal site.

Attachment B – Potential Sources of Contamination

- Hydraulic and diesel
- Portable toilet systems (Sanitary Waste)
- Trash from construction workers
- Paints, Paint Solvents, glues, concrete and other building materials
- Plant fertilizers and Pesticides
- Inadequate maintenance of temporary water pollution abatement measures
- Stock piles or spoils of materials

Attachment C – Sequence of Major Activities

The following sequence of activities is suggested. The sequence of construction will take place in two phases. Phase 'A' will include proposed collector level road Above and Beyond Way. Phase 'E' will include Peaceful Psalms Place, Shelton Street, Silver Bluff Street, Lovers Court, Telegraph Lane, and the residential lots. The actual sequence may vary slightly depending on the contractor or weather conditions.

1. Construction activities will commence with the installation of the required erosion and sediment controls for the collector level Above and Beyond Way. Phase E will commence with the installation of temporary sediment basins C1 and C2 and stabilized construction entrance. (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
2. Excavation will take place where the ponds, roads, culverts and building pads will be situated. Spoils of this material may be placed at a location on the project site as directed by the contractor or hauled off-site. These spoils and any other loose granular material will be enclosed by a silt fence. A pond will be rough graded to provide sediment containment during construction. ((Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
3. The installation of the utilities, BMPs and storm sewer will disturb a portion of the site. Proposed utility improvements include the construction of a wastewater collection system, water mains, reclaimed water mains, wastewater mains, BMPs and storm sewer extensions and connections. (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
4. Grading on the site will consist of the placement and compaction of base or select fill material under and/or around the roads, culverts and building pads and excavation and fill for the proposed roads, culverts and building pads. (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
5. Paving of the site will consist of the roads and driveways and sidewalks being concrete. (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
6. After the roads, driveways, and sidewalk are installed, finish grading around the site will be completed. (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
7. Subsequent to the construction of the ponds, roads, driveways, building pads, etc. disturbed areas will be hydro-mulched or seeded. (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
8. Once vegetation is established on the site, Temporary BMPs will be removed as allowed by the engineer.

Attachment D – Temporary Best Management Practices and Measures

The following sequence of activities is suggested. The sequence of construction will take place in one phase. The actual sequence may vary slightly depending on the contractor or weather conditions.

1. Construction activities will commence with the installation of the required silt fence and erosion and sedimentation control measures. The project will be constructed in two phases. (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
2. Excavation will take place where the roads, culverts and building pads will be situated. Spoils of this material may be placed at a location on the project site as directed by the contractor or hauled off-site. These spoils and any other loose granular material will be enclosed by a silt fence. **Silt fence, rock berm and channel rock dam will be utilized as the control measures.** (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
3. Grading on the site will consist of the placement and compaction of base or select fill material under and/or around the roads, culverts and building pads and excavation and fill for the proposed ponds, roads, culverts and building pads. **Silt fence will be utilized as the control measures.** (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
4. The installation of the utilities and storm sewer will disturb a portion of the site. Proposed utility improvements include the construction of a wastewater collection system, water mains, and storm sewer extensions and connections. **Silt fence, rock berm and inlet protection will be utilized as the control measures.** (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
5. Subsequent to the construction of the building, parking, etc. disturbed areas will be hydro-mulched or seeded. **Silt fence, rock berm and inlet protection will be utilized as the control measures.** (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).
6. Once vegetation is established on the site, Temporary BMPs will be removed as allowed by the engineer. (Phase A area = 8.54 acres), (Phase E area = 59.07 acres).

All surface runoff originating up-gradient or on site will be contained within the proposed silt fence and rock berm. The silt fence and rock berm will trap most pollutants and prevent them from entering off-site surface streams, sensitive features or the aquifer.

Attachment E – Request to Temporarily Seal a Feature

There will be no temporary sealing of naturally-occurring sensitive features on the site.

Attachment F – Structural Practices

Construction will also be phased to minimize areas of unstabilized disturbance. Silt fences, construction entrances and inlet protection will be used to limit the runoff discharge of sediments from exposed areas on the site during construction. Drainage off the site is typically in a sheet flow or shallow concentrated flow condition. All Water Quality Ponds C1, C2 and C3 will the excavated to provide a temporary sediment trap.

Attachment G – Drainage Area Map

See the Attached Woodside West - Phases A & E construction plans for existing and proposed drainage area maps.

Attachment H – Temporary Sediment Pond(s) Plan and Calculations

Construction Phase - Temporary Sediment Basin C1			
Elevation [ft]	**Area [s.f.]**	**Avg End Incremental Volume [c.f.]**	**Avg End Cumulative Volume [c.f.]**
860	25	0	0.00
861	12290.01	6158	6,157.51
862	17460.2	14875	21,032.61
863	19043.1	18252	39,284.26
864	20682.54	19863	59,147.08
866	24131	44814	103,960.62
3,000 Ft^3/Ac		Required =	29,465.27

Construction Phase - Temporary Sediment Basin C2			
Elevation [ft]	**Area [s.f.]**	**Avg End Incremental Volume [c.f.]**	**Avg End Cumulative Volume [c.f.]**
842	25	0	0.00
843	16976	8501	8,500.50
844	32318.6268	24647	33,147.81
845	52717.28	42518	75,665.77
846	59080.36	55899	131,564.59
847	62339.18	60710	192,274.36
848	65654.57	63997	256,271.23
849	69026.49	67341	323,611.76
850	72454	70740	394,352.01
851	75939.98	74197	468,549.00
3,000 Ft^3/Ac		Required =	141,985.97

Construction Phase - Temporary Sediment Basin C3			
Elevation [ft]	**Area [s.f.]**	**Avg End Incremental Volume [c.f.]**	**Avg End Cumulative Volume [c.f.]**
836	21522	0	0
837	39911	30717	30717
838	42368	41139	71856
839	44881	43624	115480
840	47451	46166	161646
842	52761	100212	261858
843	55500	54130	315988
3,000 Ft^3/Ac		Required =	104418

Attachment I – Inspection and Maintenance for BMPs

Silt Fence

1. Inspect all fences weekly and after any rainfall.
2. Remove sediment when buildup reaches 6 inches, or install a second line of fencing parallel to the old fence.
3. Replace any torn fabric or install a second line of fencing parallel to the torn section.
4. Replace or repair any sections crushed or collapsed in the course of construction activity. If a section of fence is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points.
5. When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the silt fence should be revegetated. The fence itself should be disposed of in an approved landfill.

Concrete Washout

1. Inspection should be made weekly and after each rainfall by the responsible party.
2. Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt in an approved manner that will not cause any additional siltation.
3. The berm/temporary pit should be reshaped as needed during inspection.
4. The berm/temporary pit should be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.
5. The washout should be left in place until construction has been completed.
6. When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the Concrete Washout should be revegetated.
7. The concrete from the washout should be removed from the site in an appropriate manner.

Rock Berm

1. Inspection should be made weekly and after each rainfall by the responsible party. For installations in streambeds, additional daily inspections should be made.
2. Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt in an approved manner that will not cause any additional siltation.
3. Repair any loose wire sheathing.
4. The berm should be reshaped as needed during inspection.
5. The berm should be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.
6. The rock berm should be left in place until all upstream areas are stabilized and accumulated silt removed.

Temporary Construction Entrance/Exit

1. The entrance should be maintained in a condition, which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment.
2. All sediment spilled, dropped, washed or tracked onto public rights-of-way should be removed immediately by contractor.
3. When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way.
4. When washing is required, it should be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin.
5. All sediment should be prevented from entering any storm drain, ditch or water course by using approved methods.

Temporary Sediment Basin

1. Inspection should be made weekly and after each rainfall. Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Repair should be made promptly as needed by the contractor.
2. Trash and other debris should be removed after each rainfall to prevent clogging of the outlet structure.
3. Accumulated silt should be removed and the basin should be re-graded to its original dimensions at such point that the capacity of the impoundment has been reduced to 75% of its original storage capacity.
4. The removed sediment should be stockpiled or redistributed in areas that are protected from erosion.
5. When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation.

Inlet Protection

1. Inspection should be made weekly and after each rainfall. Check inlet protection for damage. Repair should be made promptly as needed by the contractor
2. Trash and other debris should be removed after each rainfall.
3. Accumulated silt should be removed.
4. The removed sediment should be stockpiled or redistributed in areas that are protected from erosion.
5. When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation.

The following sample forms should be utilized to document the inspection and maintenance of the proposed temporary BMPs as described above. This form shall be kept on site with the WPAP until the project is completed. A report documenting the Temporary BMPs maintenance activities, sediment removal and modifications to the sedimentation and erosion controls is required.

Temporary BMP Logs – Silt Fence

Date	Date of Last Inspection	Inspection Performed By	Title	Company	Status of BMP(s)	Corrective Action Required (if any)	Date Corrective Action Completed

<u>Temporary BMP Logs – Rock Berm</u>

Date	Date of Last Inspection	Inspection Performed By	Title	Company	Status of BMP(s)	Corrective Action Required (if any)	Date Corrective Action Completed

Temporary BMP Logs – Temporary Sediment Basin

Date	Date of Last Inspection	Inspection Performed By	Title	Company	Status of BMP(s)	Corrective Action Required (if any)	Date Corrective Action Completed

Temporary BMP Logs – Temporary Construction Entrance

Date	Date of Last Inspection	Inspection Performed By	Title	Company	Status of BMP(s)	Corrective Action Required (if any)	Date Corrective Action Completed

Temporary BMP Logs – Inlet Protection

Date	Date of Last Inspection	Inspection Performed By	Title	Company	Status of BMP(s)	Corrective Action Required (if any)	Date Corrective Action Completed

Attachment J – Schedule of Interim and Permanent Soil Stabilization Practices

Vehicular traffic should be limited to areas of the project site where construction will take place. The contractor should endeavor to preserve existing vegetation as much as practicable to reduce erosion and lower the cost associated with stabilization. **Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.**

All disturbed areas shall be stabilized as described below.

Except as provided for below, stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

A. Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceases is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable.
B. Where construction activity on a portion of the site has temporarily ceased, and earth-disturbing activities will be resumed with 21 days, temporary stabilization measures do not have to be initiated on that portion of the site.
C. In areas experiencing drought, where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

Stabilization measures as described as follows:

All disturbed grass areas should be planted in drought resistant species normally grown as permanent lawns, such as Zoysia, Bermuda and Buffalo. Grass areas may be sodded, plugged, sprigged or seeded except that solid sod shall be used in swales or other areas subject to erosion. All planted areas shall be provided with a readily available water supply and watered as necessary to ensure continuous healthy growth and development. Maintenance shall include the replacement of all dead plant material if that material was used to meet the requirements of this section.

Permanent Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(C), (D)(Ii), (E), and (5), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

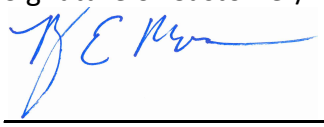
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Permanent Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: MK Woodside Development, Inc. / Steger Bizzell, Bryan Moore, P.E.

Date: 8/18/2023

Signature of Customer/Agent:



Regulated Entity Name Woodside West - Phases A & E

Permanent Best Management Practices (BMPs)

Permanent best management practices and measures that will be used during and after construction is completed.

1. ☒ Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.

   ☐ N/A

2. ☒ These practices and measures have been designed, and will be constructed, operated, and maintained to insure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance prepared or accepted by the executive director.

☒ The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

☐ A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is: _____

☐ N/A

3. ☒ Owners must insure that permanent BMPs and measures are constructed and function as designed. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the appropriate regional office within 30 days of site completion.

   ☐ N/A

4. Where a site is used for low density single-family residential development and has 20 % or less impervious cover, other permanent BMPs are not required. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.

   ☐ The site will be used for low density single-family residential development and has 20% or less impervious cover.

   ☒ The site will be used for low density single-family residential development but has more than 20% impervious cover.

   ☐ The site will not be used for low density single-family residential development.

5. The executive director may waive the requirement for other permanent BMPs for multi-family residential developments, schools, or small business sites where 20% or less impervious cover is used at the site. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.

   ☐ **Attachment A - 20% or Less Impervious Cover Waiver**. The site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is attached.

   ☐ The site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.

   ☒ The site will not be used for multi-family residential developments, schools, or small business sites.

6. ☒ **Attachment B - BMPs for Upgradient Stormwater**.

☒ A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.

☐ No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.

☐ Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.

7. ☒ **Attachment C - BMPs for On-site Stormwater**.

☒ A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.

☐ Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.

8. ☐ **Attachment D - BMPs for Surface Streams**. A description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer is attached. Each feature identified in the Geologic Assessment as sensitive has been addressed.

☒ N/A

9. ☒ The applicant understands that to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features identified in either the geologic assessment, executive director review, or during excavation, blasting, or construction.

☒ The permanent sealing of or diversion of flow from a naturally-occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed.

☐ **Attachment E - Request to Seal Features**. A request to seal a naturally-occurring sensitive feature, that includes, for each feature, a justification as to why no reasonable and practicable alternative exists, is attached.

10. ☒ **Attachment F - Construction Plans**. All construction plans and design calculations for the proposed permanent BMP(s) and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer, and are signed, sealed, and dated. The plans are attached and, if applicable include:

☒ Design calculations (TSS removal calculations)
☒ TCEQ construction notes
☒ All geologic features
☒ All proposed structural BMP(s) plans and specifications

☐ N/A

11. ☒ **Attachment G - Inspection, Maintenance, Repair and Retrofit Plan**. A plan for the inspection, maintenance, repairs, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan includes all of the following:

    ☒ Prepared and certified by the engineer designing the permanent BMPs and measures
    ☒ Signed by the owner or responsible party
    ☒ Procedures for documenting inspections, maintenance, repairs, and, if necessary retrofit
    ☒ A discussion of record keeping procedures

    ☐ N/A

12. ☐ **Attachment H - Pilot-Scale Field Testing Plan**. Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.

    ☒ N/A

13. ☐ **Attachment I -Measures for Minimizing Surface Stream Contamination**. A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity, which increase erosion that results in water quality degradation.

    ☒ N/A

Responsibility for Maintenance of Permanent BMP(s)

Responsibility for maintenance of best management practices and measures after construction is complete.

14. ☒ The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.

    ☐ N/A

15. ☒ A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.

    ☐ N/A

Attachment B – BMPs for Upgradient Stormwater

A portion of upgradient stormwater will be treated in a water quality and batch detention pond. The remaining portion of upgradient stormwater will be routed through a series of culverts and treated with Vegetative filter strips.

Attachment C – BMPs for On-site Stormwater

Development of Woodside West - Phases A & E is limited to impervious cover based on the lot size and 45% overall impervious cover, therefore development of the property is based on these impervious cover limitations. The partial batch detention ponds (Pond C1, Pond C2, Pond C3) have been designed for 91-percent removal. Pond C1 will provide treatment to an area of 9.82 acres, Pond C2 will provide treatment to an area of 41.70 acres and Pond C3 will provide treatment to an area of 28.46 acres.

The use of vegetative filter strips will also be used to treat the on-site stormwater for a total site removal of 85 percent.

Pond C1

	Square Footage	Acreage
Structures/Rooftops	184,694	4.24
Paved Surfaces	90,605	2.08
Total Impervious Cover	275,299	6.32
Total Area	1,957,586	9.82
Impervious Cover (%)	64%	

Pond C2

	Square Footage	Acreage
Structures/Rooftops	639,461	14.68
Paved Surfaces	400,752	9.2
Total Impervious Cover	1,040,213	23.88
Total Area	1,816,452	41.7
Impervious Cover (%)	57%	

Pond C3

	Square Footage	Acreage
Structures/Rooftops	403,801	9.27
Paved Surfaces	265,716	6.1
Total Impervious Cover	669,517	15.37
Total Area	1,239,718	28.46
Impervious Cover (%)	54%	

Attachment D – BMPs for Surface Streams

There are no additional BMPs for minimizing pollutants from entering surface streams. The Permanent BMPs have been designed to remove 85% of the anticipated pollutant loads. Temporary BMPs have been designed to reduce the potential pollutant load during construction activities.

Attachment E – Request to Seal Features

There are no sensitive features that require sealing.

Attachment F – Construction Plans

See Attached Woodside West - Phases A & E Construction Plans

Attachment G – Inspection, Maintenance, Repair and Retrofit Plan

The following can be found in the TCEQ's "Complying with the Edwards Rules: Technical Guidance Manual on Best Management Practices."

Maintenance Guidelines for Batch Detention Basins

Batch detention basins may have somewhat higher maintenance requirements than an extended detention basin since they are active stormwater controls. The maintenance activities are identical to those of extended detention basins with the addition of maintenance and inspections of the automatic controller and the valve at the outlet.

Inspections. Inspections should take place a minimum of twice a year. One inspection should take place during wet weather to determine if the basin is meeting the target detention time of 12 hours and a drawdown time of no more than 48 hours. The remaining inspections should occur between storm events so that manual operation of the valve and controller can be verified. The level sensor in the basin should be inspected and any debris or sediment in the area should be removed. The outlet structure and the trash screen should be inspected for signs of clogging. Debris and sediment should be removed from the orifice and outlet(s) as described in previous sections. Debris obstructing the valve should be removed. During each inspection, erosion areas inside and downstream of this BMP should be identified and repaired/revegetated immediately.

Mowing. The basin, basin side-slopes, and embankment of the basin must be mowed to prevent woody growth and control weeds. A mulching mower should be used, or the grass clippings should be caught and removed. Mowing should take place at least twice a year, or more frequently if vegetation exceeds 18 inches in height. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas.

Litter and Debris Removal. Litter and debris removal should take place at least twice a year, as part of the periodic mowing operations and inspections. Debris and litter should be removed from the surface of the basin. Particular attention should be paid to floatable debris around the outlet structure. The outlet should be checked for possible clogging or obstructions and any debris removed.

Erosion control. The basin side slopes and embankment all may periodically suffer from slumping and erosion. To correct these problems, corrective action, such as regarding and revegetation, may be necessary. Correction of erosion control should take place whenever required based on the periodic inspections.

Nuisance Control. Standing water or soggy conditions may occur in the basin. Some standing water may occur after a storm event since the valve may close with 2 to 3 inches of water in the basin. Some flow into the basin may also occur between storms due to spring flow and

residential water use that enters the storm sewer system. Twice a year, the facility should be evaluated in terms of nuisance control (insects, weeds, odors, algae, etc.).

Structural Repairs and Replacement. With each inspection, any damage to structural elements of the basin (pipes, concrete drainage structures, retaining walls, etc.) should be identified and repaired immediately. An example of this type of repair can include patching of cracked concrete, sealing of voids, removal of vegetation from cracks and joints. The various inlet/outlet structures in a basin will eventually deteriorate and must be replaced.

Sediment Removal. A properly designed batch detention basin will accumulate quantities of sediment over time. The accumulated sediment can detract from the appearance of the facility and reduce the pollutant removal performance of the facility. The sediment also tends to accumulate near the outlet structure and can interfere with the level sensor operation. Sediment shall be removed from the basin at least every 5 years, when sediment depth exceeds 6 inches, when the sediment interferes with the level sensor or when the basin does not drain within 48 hours. Care should be taken not to compromise the basin lining during maintenance.

Logic Controller. The Logic Controller should be inspected as part of the twice yearly investigations. Verify that the external indicators (active, cycle in progress) are operating properly by turning the controller off and on, and by initiating a cycle by triggering the level sensor in the basin. The valve should be manually opened and closed using the open/close switch to verify valve operation and to assist in inspecting the valve for debris. The solar panel should be inspected and any dust or debris on the panel should be carefully removed. The controller and all other circuitry and wiring should be inspected for signs of corrosion, damage from insects, water leaks, or other damage. At the end of the inspection, the controller should be reset.

Vegetative Filter Strips

Once a vegetated area is well established, little additional maintenance is generally necessary. The key to establishing a viable vegetated feature is the care and maintenance it receives in the first few months after it is planted. Once established, all vegetated BMPs require some basic maintenance to insure the health of the plants including:

- *Pest Management*. An Integrated Pest Management (IPM) Plan should be developed for vegetated areas. This plan should specify how problem insects and weeds will be controlled with minimal or no use of insecticides and herbicides.

- *Seasonal Mowing and Lawn Care*. If the filter strip is made up of turf grass, it should be mowed as needed to limit vegetation height to 18 inches, using a mulching mower (or removal of clippings). If native grasses are used, the filter may require less frequent mowing, but a minimum of twice annually. Grass clippings and brush debris should not be deposited on vegetated filter strip areas. Regular mowing should also include weed control practices, however herbicide use should be kept to a minimum (Urbonas et al., 1992). Healthy grass can be maintained without using fertilizers because runoff usually contains sufficient nutrients. Irrigation of the site can help assure a dense and healthy vegetative cover.

- *Inspection*. Inspect filter strips at least twice annually for erosion or damage to vegetation; however, additional inspection after periods of heavy runoff is most desirable. The strip should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first few years after establishment will help to determine if any problems are developing, and to plan for long-term restorative maintenance needs. Bare spots and areas of erosion identified during semi-annual inspections must be replanted and 3-92 restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.

- *Debris and Litter Removal*. Trash tends to accumulate in vegetated areas, particularly along highways. Any filter strip structures (i.e. level spreaders) should be kept free of obstructions to reduce floatables being flushed downstream, and for aesthetic reasons. The need for this practice is determined through periodic inspection, but should be performed no less than 4 times per year.

- *Sediment Removal*. Sediment removal is not normally required in filter strips, since the vegetation normally grows through it and binds it to the soil. However, sediment may accumulate along the upstream boundary of the strip preventing uniform overland flow. Excess sediment should be removed by hand or with flat-bottomed shovels.

- *Grass Reseeding and Mulching*. A healthy dense grass should be maintained on the filter strip. If areas are eroded, they should be filled, compacted, and reseeded so that the

final grade is level. Grass damaged during the sediment removal process should be promptly replaced using the same seed mix used during filter strip establishment. If possible, flow should be diverted from the damaged areas until the grass is firmly established. Bare spots and areas of erosion identified during semi-annual inspections must be replanted and restored to meet specifications. Corrective maintenance, such as weeding or replanting should be done more frequently in the first two to three years after installation to ensure stabilization. Dense vegetation may require irrigation immediately after planting, and during particularly dry periods, particularly as the vegetation is initially established.

NOTE: This Inspection, Maintenance, Repair and Retrofit Plan for the **Woodside West - Phases A & E Filter Strips and Water Quality Ponds** were created and designed by the engineer of this BMP. Maintenance is the responsibility of the Owner and should be followed in accordance with this plan in order to keep the BMPs operating correctly.

DocuSigned by:
Blake J. Magee
5EA2F91945EE4B7...

8/18/2023

Blake Magee
MK Woodside Development, Inc.

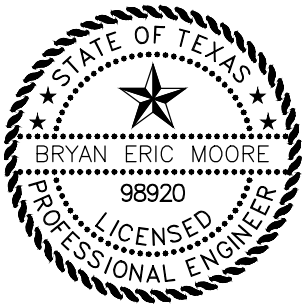
Date

DocuSigned by:
Bryan E. Moore
5B5EB3EE3AB14AA...

8/17/2023

Bryan E. Moore, P.E.
Steger Bizzell
F-181

Date



SAMPLE)** PERMANENT BMP LOG **(SAMPLE)**

INSPECTOR: _____ DATE: _____

Inspectors Company: _____

Company Address: _____

_____

_____

Company Phone: _____ Fax: _____

Date of Last Inspection: _____ Recent Heavy Rainfall: YES NO
(CIRCLE ONE)

Status of BMP(s): _____

_____

_____

_____

_____

Corrective Action Required (if any): _____

_____

_____

_____

_____

Date Corrected (if applicable): _____

*If actions are required they must be completed within 7 working days of this INSPECTION.

_____ _____

Inspectors Signature Date:

Agent Authorization Form

For Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

I Mr. Blake Magee,
Print Name

President,
Title - Owner/President/Other

of MK Woodside Development, Inc.,
Corporation/Partnership/Entity Name

have authorized Mr. Bryan E. Moore, P.E.
Print Name of Agent/Engineer

of Steger Bizzell
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.

3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.

4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.

5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

DocuSigned by:
Blake J. Magee
6EA2F31045EE487...
Applicant's Signature

8/18/2023
Date

THE STATE OF TEXAS §

County of Travis §

BEFORE ME, the undersigned authority, on this day personally appeared Mr. Blake Magee known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 18th day of August, 2023.

DocuSigned by:
Jennifer Sparks
D1AA0002990AF1H3...
NOTARY PUBLIC

Jennifer Sparks
Typed or Printed Name of Notary

Jennifer J Sparks
My Commission Expires
11/22/2026
Notary ID 128451183

MY COMMISSION EXPIRES: 11/22/2026

Owner Authorization Form

for Required Signature for submitting and signing an application for an Edwards Aquifer Protection Plan (Plan) and conducting regulated activities in accordance with an approved Plan.

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program
Relating to the Edwards Aquifer Rules of
Title 30 of the Texas Administrative Code
(30 TAC), Chapter 213
Effective June 1, 1999

Land Owner Authorization

I, Steve Ashlock of Pulte Homes of Texas, LP
Land Owner Name (Individual) Firm (applicable to Legal Entities)

am the Owner of Record or Title Holder of the property located at:

Williamson Co Tax Parcels R641786
(Legal description of the property referenced in the application)

and being duly authorized under 30 TAC § 213.4(c)(2) and § 213.4(d)(1) or § 213.23(c)(2) and § 213.23(d) to submit and sign an application for a Plan, do hereby authorize:

MK Woodside Development, Inc.
(Applicant Name / Plan Holder (Legal Entity or Individual))

to conduct:

Installation Temporary BMPs and SCS Improvements
(Description of the proposed regulated activities)

on the property described above or at:

n/a
(If applicable to a precise location for the authorized regulated activities)

Land Owner Acknowledgement

I, Steve Ashlock of Pulte Homes of Texas, LP
Land Owner Name (Individual) Firm (applicable to Legal Entities)

understand that while MK Woodside Development, Inc.
Applicant Name / Plan Holder (Legal Entity or Individual)

is responsible for compliance with the approved or conditionally approved Plan and any special conditions of the approved Plan through all phases of Plan implementation,

I, Steve Ashlock of Pulte Homes of Texas, LP
Land Owner Name (Individual) Firm (applicable to Legal Entities)

as Owner of Record or Title Holder of the property described above, I am ultimately responsible for ensuring that compliance with the approved or conditionally approved Plan and any special conditions of the approved Plan, through all phases of Plan implementation, is achieved even if the responsibility for compliance and the right to possess and control of the property referenced in the application has been contractually assumed by another legal entity.

I, Steve Ashlock of Pulte Homes of Texas, LP
Land Owner Name (Individual) Firm (applicable to Legal Entities)

further understand that any failure to comply with any condition of the Executive Director's approval is a violation and is subject to administrative rule or orders and penalties as provided under 30 TAC § 213.10 (relating to Enforcement). Such violation may also be subject to civil penalties and injunction.

Land Owner Signature

DocuSigned by: Stephen Ashlock 8/17/2023
Land Owner Signature Date

THE STATE OF § Texas

County of § Williamson

BEFORE ME, the undersigned authority, on this day personally appeared known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 18th day of August 2023

Jennifer J Sparks
My Commission Expires
11/22/2026
Notary ID 128451183

DocuSigned by: Jennifer Sparks
NOTARY PUBLIC

Jennifer Sparks
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 11/22/2026

Attached: (Mark all that apply)

- ☐ Lease Agreement
- ☐ Signed Contract
- ☐ Deed Recorded Easement
- ☐ Other legally binding document

Applicant Acknowledgement

I, Blake Magee (Applicant Name (Individual)) of MK Woodside Development, Inc. (Firm (applicable to Legal Entities))

acknowledge that Pulte Homes of Texas, LP (Land Owner Name (Legal Entity or Individual))

has provided MK Woodside Development, Inc. (Applicant Name (Legal Entity or Individual))

with the right to possess and control the property referenced in the Edwards Aquifer Protection Plan (Plan).

I understand that MK Woodside Development, Inc. (Applicant Name (Legal Entity or Individual))

is responsible, contractually or not, for compliance with the approved or conditionally approved Plan and any special conditions of the approved Plan through all phases of Plan implementation. I further understand that failure to comply with any condition of the Executive Director's approval is a violation and is subject to administrative rule or orders and penalties as provided under § 213.10 (relating to Enforcement). Such violation may also be subject to civil penalties and injunction.

Applicant Signature

DocuSigned by: Blake J. Magee — Applicant Signature

8/18/2023 — Date

THE STATE OF § Texas

County of § Travis

BEFORE ME, the undersigned authority, on this day personally appeared known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 18th day of August 2023

Jennifer J Sparks
My Commission Expires
11/22/2026
Notary ID 128451183

DocuSigned by: Jennifer Sparks — NOTARY PUBLIC

Jennifer Sparks — Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 11/22/2026

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Woodside West - Phases A & E
Regulated Entity Location: Georgetown, TX

Name of Customer: MK Woodside Development, Inc. / Steger Bizzell

Contact Person: Blake Magee Phone: (512) 481-0303
Customer Reference Number (if issued): CN CN606076271
Regulated Entity Reference Number (if issued): RN N/A

Austin Regional Office (3373)

☐ Hays ☐ Travis ☒ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde
☐ Comal ☐ Kinney

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment**. This payment is being submitted to:

☒ Austin Regional Office
☐ Mailed to: TCEQ - Cashier

Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☐ San Antonio Regional Office
☐ Overnight Delivery to: TCEQ - Cashier

12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	***Size***	***Fee Due***
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	71.26 Acres	$ 6,500.00
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	$
Sewage Collection System	5217 L.F.	$ 2,608.50
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature: _____ Date: 8/18/2023

Application Fee Schedule

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

Project	*Project Area in Acres*	*Fee*
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

Project	*Cost per Linear Foot*	*Minimum Fee-Maximum Fee*
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

Project	*Cost per Tank or Piping System*	*Minimum Fee-Maximum Fee*
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

TCEQ Core Data Form

TCEQ Use Only

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided*)

☒ New Permit, Registration or Authorization *(Core Data Form should be submitted with the program application)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Attachments **Describe Any Attachments:** *(ex. Title V Application, Waste Transporter Application, etc.)*

☐ Yes ☒ No

3. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	4. Regulated Entity Reference Number *(if issued)*
CN CN606076271		RN

SECTION II: Customer Information

5. Effective Date for Customer Information Updates (mm/dd/yyyy) 8/18/2023

6. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check only one of the following:*

☒ Owner ☐ Operator ☐ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other: _____

7. General Customer Information

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State) ☒ No Change**

If "No Change" and Section I is complete, skip to Section III – Regulated Entity Information.

8. Type of Customer:	☐ Corporation	☐ Individual	☐ Sole Proprietorship- D.B.A
☐ City Government	☐ County Government	☐ Federal Government	☐ State Government
☐ Other Government	☐ General Partnership	☒ Limited Partnership	☐ Other:

9. Customer Legal Name (*If an individual, print last name first: ex: Doe, John*) *If new Customer, enter previous Customer below* *End Date:*

MK Woodside Development, Inc.

10. Mailing Address: 1011 North Lamar

City	Austin	State	TX	ZIP	78703	ZIP + 4	

11. Country Mailing Information (*if outside USA*)

12. E-Mail Address (*if applicable*) blake@blakemageeco.com

13. Telephone Number	14. Extension or Code	15. Fax Number (*if applicable*)
(512) 481-0303		(888) 609-4594

16. Federal Tax ID (*9 digits*)	17. TX State Franchise Tax ID (*11 digits*)	18. DUNS Number (*if applicable*)	19. TX SOS Filing Number (*if applicable*)
87-3727833	32081347612		0804265234

20. Number of Employees ☐ 0-20 ☒ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

21. Independently Owned and Operated? ☒ Yes ☐ No

SECTION III: Regulated Entity Information

22. General Regulated Entity Information (*If 'New Regulated Entity" is selected below this form should be accompanied by a permit application*)

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information ☐ No Change** (*See below*)

If "NO CHANGE" is checked and Section I is complete, skip to Section IV, Preparer Information.

23. Regulated Entity Name (*name of the site where the regulated action is taking place*)

Woodside West - Phases A & E

24. Street Address of the Regulated Entity: *(No P.O. Boxes)*	Ronald Reagan Boulevard & SH 195						
	City	Georgetown	**State**	TX	**ZIP**	78633	**ZIP + 4**
25. Mailing Address:	1011 North Lamar						
	City	Austin	**State**	TX	**ZIP**	78703	**ZIP + 4**

26. E-Mail Address:	stephen.ashlock@pultegroup.com

27. Telephone Number	**28. Extension or Code**	**29. Fax Number** *(if applicable)*
(512) 532-3355		(888) 609-4594

30. Primary SIC Code (4 digits)	**31. Secondary SIC Code** (4 digits)	**32. Primary NAICS Code** (5 or 6 digits)	**33. Secondary NAICS Code** (5 or 6 digits)
6552	1521	N/A	

34. What is the Primary Business of this entity? *(Please do not repeat the SIC or NAICS description.)*

Land Development and Residential Homes

Questions 34 – 37 address geographic location. Please refer to the instructions for applicability.

35. Description to Physical Location:	Southwest of the intersection of TX-195 and Ronald Reagan Boulevard in Georgetown, TX

36. Nearest City	**County**	**State**	**Nearest ZIP Code**
Georgetown	Williamson	TX	78633

37. Latitude (N) In Decimal:	30.7493		**38. Longitude (W) In Decimal:**	-97.7278	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	44	12.96	-98	16	-15.67

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form or the updates may not be made. If your Program is not listed, check other and write it in. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Industrial Hazardous Waste	☐ Municipal Solid Waste
		SCS & WPAP		
☐ New Source Review – Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS	☐ Sludge
☐ Stormwater	☐ Title V – Air	☐ Tires	☐ Used Oil	☐ Utilities
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

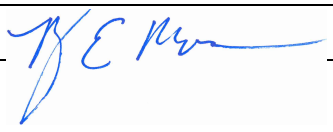
40. Name:	Steger Bizzell – Bryan E. Moore, P.E.	**41. Title:**	Principal

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(512) 930-9412		( ) -	bmoore@stegerbizzell.com

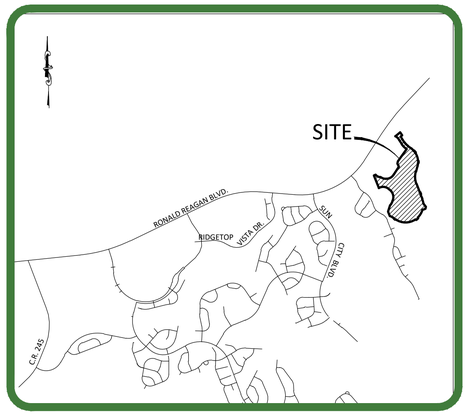
SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 9 and/or as required for the updates to the ID numbers identified in field 39.

(See the Core Data Form instructions for more information on who should sign this form.)

Company:	Steger Bizzell	**Job Title:**	Principal		
Name *(In Print)* :	Mr. Bryan E. Moore, P.E.			**Phone:**	(512) 930-9412
Signature:				**Date:**	8/18/2023

CONSTRUCTION PLANS
FOR
WOODSIDE WEST - PHASES A & E
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS
2023-19-CON



Location Map
1" = 3000'

NOTE:

1. These construction plans were prepared, sealed, signed, and dated by a Texas Licensed Professional Engineer. Therefore based on the engineer's concurrence of compliance, the construction plans for construction of the proposed project are hereby approved subject to the Standard Construction Specifications and Details Manual and all other applicable City, State and Federal Requirements and Codes.
2. This project is subject to all City Standard Specifications and Details in effect at the time of submittal of the project to the City.
3. The property subject to this application is subject to the Water Quality Regulations of the City of Georgetown.
4. A Geologic Assessment, in accordance with the City of Georgetown Water Quality Regulations, was completed on July, 2022. Any springs and streams as identified in the Geologic Assessment are shown herein.
5. The project limits of construction is 71.26 acres.
6. All electric distribution lines and individual service lines shall be installed underground. If overhead lines existed prior to underground installation, such poles, guys wires, and related structures shall be removed following construction of the underground infrastructure (only applicable for residential property).
7. All electric communication and infrastructure shall comply with UDC Section 13.06
8. All bearings and coordinates are referenced to the Texas Coordinate System, Central Zone. NAD 83 horizontal control datum and NGVD 29 vertical control datum. All distances and coordinates are surface and may be converted to grid by multiplying by the combined scale factor of 0.999856056. The translation of the Sun City coordinate system to NAD 83 / 93 HARN coordiante sytstem and the NAVD 88 Vertical Datum are as follows:
   (NAD83) Northing -1.83' = Northing (NAD 83 / 93 HARN)
   (NAD83) Easting -1.49' = Easting (NAD 83 / 93 HARN)
   (NGVD29) Elevation +0.35' = Elevation (NAD 83 / 93 HARN)
9. The project site is located within FEMA Floodplain FIRM Panel No. 48491C0280E, effective 9/26/2008.

BEFORE YOU DIG Texas811.com

TEXAS ONE-CALL 800-344-8377

NOTE:
CONTRACTOR IS TO FURNISH A SET OF CONSTRUCTION PLANS BACK TO THE ENGINEER AT THE END OF THE PROJECT WITH ALL DEVIATIONS NOTED IN RED INK ON THE PLAN SHEETS. CONTRACTOR SHALL NOT RECEIVE FINAL PAYMENT UNTIL COMPLETE "AS-BUILT" SET IS RETURNED TO ENGINEER.

SHEET LIST	
SHEET NUMBER	SHEET TITLE
01	COVER
02	GENERAL NOTES (1 OF 2)
03	GENERAL NOTES (2 OF 2)
04	PRELIMINARY PLAT (1 OF 2)
05	PRELIMINARY PLAT (2 OF 2)
06	EXISTING DRAINAGE PLAN
07	DEVELOPED DRAINAGE PLAN
08	WATER QUALITY PLAN
09	STRM-OFF INLET CALCULATIONS
10	STRM-C2 INLET CALCULATIONS (1 OF 2)
11	STRM-C2 INLET CALCULATIONS (2 OF 2)
12	STRM-C3 INLET CALCULATIONS
13	PHASING PLAN
14	EROSION & SEDIMENTATION PLAN (1 OF 2)
15	EROSION & SEDIMENTATION PLAN (2 OF 2)
16	EROSION AND SEDIMENTATION DETAILS
17	ABOVE AND BEYOND WAY PLAN & PROFILE (1 OF 6)
18	ABOVE AND BEYOND WAY PLAN & PROFILE (2 OF 6)
19	ABOVE AND BEYOND WAY PLAN & PROFILE (3 OF 6)
20	ABOVE AND BEYOND WAY PLAN & PROFILE (4 OF 6)
21	ABOVE AND BEYOND WAY PLAN & PROFILE (5 OF 6)
22	ABOVE AND BEYOND WAY PLAN & PROFILE (6 OF 6)
23	PEACEFUL PSALMS PLACE PLAN & PROFILE (1 OF 3)
24	PEACEFUL PSALMS PLACE PLAN & PROFILE (2 OF 3)
25	PEACEFUL PSALMS PLACE PLAN & PROFILE (3 OF 3)
26	PEACEFUL PSALMS PLACE CDS PLAN & PROFILE
27	SHELTON STREET PLAN & PROFILE
28	SILVER BLUFF STREET PLAN & PROFILE
29	TELEGRAPH LANE PLAN & PROFILE (1 OF 2)
30	TELEGRAPH LANE PLAN & PROFILE (2 OF 2)
31	LOVERS COURT PLAN & PROFILE
32	OVERALL STORMSEWER PLAN (1 OF 2)
33	OVERALL STORMSEWER PLAN (2 OF 2)
34	SS-OS01 PLAN & PROFILE
35	OFFSITE DIVERSION CULVERT PLAN, PROFILE & CALCULATIONS
36	COLLECTOR CULVERTS PLAN PROFILE & CALCULATIONS
37	SS-C1A01 PLAN & PROFILE
38	SS-C201 PLAN & PROFILE (1 OF 2)
39	SS-C201 PLAN & PROFILE (2 OF 2)
40	SS-C201 LATERALS
41	SS-C231 PLAN & PROFILE
42	SS-C251 PLAN & PROFILE
43	SS-C261 PLAN & PROFILE (1 OF 2)
44	SS-C261 PLAN & PROFILE (2 OF 2)
45	SS-C261 LATERALS
46	SS-C281 PLAN & PROFILE

SHEET LIST	
SHEET NUMBER	SHEET TITLE
47	WATER QUALITY & DETENTION POND C1 PLAN
48	WATER QUALITY AND DETENTION POND C1 DETAILS
49	WATER QUALITY POND C2 PLAN
50	WATER QUALITY POND C2 DETAILS
51	SS-C301 PLAN & PROFILE
52	SS-C301 LATERALS
53	SS-C311 PLAN & PROFILE
54	SS-C311 LATERALS
55	SS-C321 PLAN & PROFILE
56	SS-C331 PLAN & PROFILE
57	SS-C331 LATERALS
58	WATER QUALITY POND C3 PLAN
59	WATER QUALITY POND C3 DETAILS
60	PAVING AND DRAINAGE DETAILS (1 OF 3)
61	PAVING AND DRAINAGE DETAILS (2 OF 3)
62	PAVING AND DRAINAGE DETAILS (3 OF 3)
63	OVERALL WASTEWATER PLAN (1 OF 2)
64	OVERALL WASTEWATER PLAN (2 OF 2)
65	WW-A03 & WW-A04 PROFILE
66	WW-A06 & WW-A07 PROFILE
67	WW-A11 PROFILE
68	WW-A31 PROFILE
69	WW-A351 PROFILE
70	WW-A36 PROFILE
71	WASTEWATER DETAILS (1 OF 2)
72	WASTEWATER DETAILS (2 OF 2)
73	OVERALL WATER PLAN (1 OF 2)
74	OVERALL WATER PLAN (2 OF 2)
75	12 IN COLLECTOR PLAN & PROFILE (1 OF 6)
76	12 IN COLLECTOR PLAN & PROFILE (2 OF 6)
77	12 IN COLLECTOR PLAN & PROFILE (3 OF 6)
78	12 IN COLLECTOR PLAN & PROFILE (4 OF 6)
79	12 IN COLLECTOR PLAN & PROFILE (5 OF 6)
80	12 IN COLLECTOR PLAN & PROFILE (6 OF 6)
81	WATER DETAILS
82	OVERALL GRADING PLAN (1 OF 2)
83	OVERALL GRADING PLAN (2 OF 2)
84	ABOVE & BEYOND ROUNDABOUT DETAILED GRADING PLAN
85	SIGNAGE & STRIPING PLAN (1 OF 2)
86	SIGNAGE & STRIPING PLAN (2 OF 2)
87	STRIPING AND SIGNAGE DETAILS
88	INTERSECTION DETAILS (1 OF 6)
89	INTERSECTION DETAILS (2 OF 6)
90	INTERSECTION DETAILS (3 OF 6)
91	INTERSECTION DETAILS (4 OF 6)
92	INTERSECTION DETAILS (5 OF 6)
93	INTERSECTION DETAILS (6 OF 6)
LP-N1	PLANTING NOTES
LP-1	PLANTING PLAN
LP-2	PLANTING PLAN
LP-3	PLANTING PLAN
LP-4	PLANTING PLAN
LP-5	PLANTING PLAN
LP-6	PLANTING PLAN
LP-D1	PLANTING DETAIL & PROTOTYPICAL LOT

Submitted By:

08/24/2023

Bryan E. Moore, P.E. — Date

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER

BENCHMARKS:

TYPE II TXDOT MONUMENT
ELEV = 892.33'
N = 10246271.44'
E = 3121889.16'

STEGER BIZZELL

ADDRESS	1978 S. AUSTIN AVENUE		GEORGETOWN, TX 78626
METRO	512.930.9412	TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700	WEB STEGERBIZZELL.COM
SERVICES	>>ENGINEERS	>>PLANNERS	>>SURVEYORS

Warning!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

OWNER / DEVELOPER

PULTE HOMES OF TEXAS, L.P.
9401 AMBERGLEN DRIVE, BLDG I,
STE. 150
AUSTIN, TEXAS 78729
512-532-3355
CONTACT: STEVE ASHLOCK
STEPHEN.ASHLOCK@PULTEGROUP.COM

SURVEYOR

McKIM & CREED
TBPLS FIRM NO. 10177601
8868 RESEARCH BLVD, STE. 407
AUSTIN, TEXAS 78758
512-916-0224
CONTACT: JORGE FERNANDEZ, R.P.L.S

ENGINEER/APPLICANT:

STEGER BIZZELL

STEGER BIZZELL
TBPLS FIRM NO. 10003700
1978 S. AUSTIN AVE
GEORGETOWN, TEXAS 78626
OFFICE: 512-930-9412
CONTACT: BRYAN MOORE

Project Number:
22226 MADISON TRACT

SEQUENCE OF CONSTRUCTION

1. Temporary erosion and sedimentation controls are to be installed as indicated on the approved construction plan and in accordance with the Stormwater Pollution Prevention Plan (SWPPP) that is required to be posted on the site. Install tree protection and initiate tree mitigation measures.

2. Prior to beginning construction, the Owner or his authorized representative, shall convene a Pre-Construction Conference between the City of Georgetown, Engineer, Contractor, County Engineer (if applicable), Texas Commission on Environmental Quality Field Office, and any other affected parties. Notify all such parties at least 48 hours prior to the time of the conference and 48 hours prior to beginning construction.

3. The Environmental Project Manager, and/or Site Supervisor, and/or Designated Responsible Party, and the General Contractor will follow the Storm Water Pollution Prevention Plan (SWPPP) posted on the site. Temporary erosion and sedimentation controls will be revised, if needed, to comply with City Inspectors' directives, and revised construction schedule relative to the water quality plan requirements and the erosion plan.

4. Rough grade the pond(s) at 100% proposed capacity. Either the permanent outlet structure or a temporary outlet must be constructed prior to development of embankment or excavation that leads to ponding conditions. The outlet system shall be protected from erosion and shall be maintained throughout the course of construction until installation of the permanent water quality pond(s).

5. Temporary erosion and sedimentation controls will be inspected and maintained in accordance with the Storm Water Pollution Prevention Plan (SWPPP) posted on the site.

6. Begin site clearing/construction activities.

7. Permanent water quality ponds or controls will be cleaned out and filter media will be installed prior to/concurrently with revegetation of site.

8. Complete construction and start revegetation of the site and installation of landscaping.

9. Upon completion of the site construction and revegetation of a project site, a final inspection will be scheduled by the appropriate City Inspector.

10. After a final inspection has been conducted by the City Inspector and with approval from the City Inspector, remove the temporary erosion and sedimentation controls and complete any necessary final revegetation resulting from removal of the controls. Conduct any maintenance and rehabilitation of the water quality ponds or controls.

ACCESSIBILITY NOTES

1. Project shall be constructed in full compliance with the Texas Accessibility Standards (TAS) 2012.

2. Slopes in the direction of pedestrian travel shall not exceed 5% (1:20) or have a cross slope greater than 2% (1:48). This shall include routes that cross-vehicular ways including but not limited pedestrian/ vehicular ways such as street intersections.

   A. Exception: Per TAS 405.8 and 68.102 (1) grades at the new sidewalks parallel to the streets shall be equal to, or less than, the street grade. Should the new sidewalks exceed the street grade, and the new sidewalk grades exceed 5% in the direction of travel, ramps complying with TAS 405 are required at these conditions.

3. Curb Ramps:
   A. Curb ramps shall not exceed 8.3% (1:12) in the direction of pedestrian travel.
   B. Curb ramps flares (wings) shall not exceed 1:10.
   C. Minimum width of a curb ramp is 36".
   D. Top of the curb ramp must be 2% in all directions for an area 36" wide and 48"deep.
   E. When truncated domes are used, the truncated dome system shall extend the full width of the curb ramp and for a minimum depth of 24" at the bottom of the curb ramp.
   F. Returned curb ramps shall only be used where the adjacent surface on one or both sides of the curb ramp do not allow pedestrian travel such as but not limited to stop lights, stop signs and permanently mounted waste receptacles.

4. There shall be no changes in level greater than ¼" on any accessible route or ½" with a 1:2 bevel.

5. Decomposed granite surfaces, or similar Engineer-approved surfaces shall be compacted tight and maintained by the Owner at all times.

6. Provide directional signage using the international symbol of accessibility when not all routes are accessible. Signage shall be placed at the beginning of the route to avoid a patron from proceeding on a non-accessible route.

7. Verify that no plantings or other site elements on circulation paths would be protruding objects based on TAS 307 (protrudes more 4" and is higher than 27" from the surface and less than 80" from the surface).

Contractor shall notify the Engineer before proceeding with any Work, which is in conflict with the Texas Accessibility Standards. Contractor is financially responsible for proceeding with any Work without written direction on any clarification from the Engineer.

TCEQ WATER DISTRIBUTION SYSTEM GENERAL CONSTRUCTION NOTES

1. This water distribution system must be constructed in accordance with the current Texas Commission on Environmental Quality (TCEQ) Rules and Regulations for Public Water Systems 30 Texas Administrative Code (TAC) Chapter 290 Subchapter D. When conflicts are noted with local standards, the more stringent requirement shall be applied. Construction for public water systems must always, at a minimum, meet TCEQ's "Rules and Regulations for Public Water Systems.
2. An appointed engineer shall notify in writing the local TCEQ's Regional Office when construction will start. Please keep in mind that upon completion of the water works project, the engineer or owner shall notify the commission's Water Supply Division, in writing, as to its completion and attest to the fact that the work has been completed essentially according to the plans and change orders on file with the commission as required in 30 TAC §290.39(h)(3).
3. All newly installed pipes and related products must conform to American National Standards Institute (ANSI)/NSF International Standard 61 and must be certified by an organization accredited by ANSI, as required by 30 TAC §290.44(a)(1).
4. Plastic pipe for use in public water systems must bear the NSF International Seal of Approval (NSF-pw) and have an ASTM design pressure rating of at least 150 psi or a standard dimension ratio of 26 or less, as required by 30 TAC §290.44(a)(2).
5. No pipe which has been used for any purpose other than the conveyance of drinking water shall be accepted or relocated for use in any public drinking water supply, as required by 30 TAC §290.44(a)(3).
6. Water transmission and distribution lines shall be installed in accordance with the manufacturer's instructions. However, the top of the water line must be located below the frost line and in no case shall the top of the water line be less than 24 inches below ground surface, as required by 30 TAC §290.44(a)(4).
7. Pursuant to 30 TAC §290.44(a)(5), the hydrostatic leakage rate shall not exceed the amount allowed or recommended by the most current AWWA formulas for PVC pipe, cast iron and ductile iron pipe. Include the formulas in the notes on the plans.
   - The hydrostatic leakage rate for polyvinyl chloride (PVC) pipe and appurtenances shall not exceed the amount allowed or recommended by formulas in America Water Works Association (AWWA) C-605 as required in 30 TAC §290.44(a)(5). Please ensure that the formula for this calculation is correct and most current formula is in use;

     $Q = \frac{L \times D \times P^{1/2}}{148{,}000}$

     Q = the quantity of makeup water in gallons per hour,
     L = the length of the pipe section being tested, in feet,
     D = the nominal diameter of the pipe in inches, and
     P = the average test pressure during the hydrostatic test in pounds per square inch (psi).

   - The hydrostatic leakage rate for ductile iron (DI) pipe and appurtenances shall not exceed the amount allowed or recommended by formulas in America Water Works Association (AWWA) C-600 as required in 30 TAC §290.44(a)(5). Please ensure that the formula for this calculation is correct and most current formula is in use;

     $L = \frac{S \times D \times P^{1/2}}{148{,}000}$

     L = the quantity of makeup water in gallons per hour,
     S = the length of the pipe section being tested, in feet,
     D = the nominal diameter of the pipe in inches, and
     P = the average test pressure during the hydrostatic test in pounds per square inch (psi).

8. The maximum allowable lead content of pipes, pipe fittings, plumbing fittings, and fixtures to 0.25 percent.
9. The system must be designed to maintain a minimum pressure of 35 psi at all points within the distribution network at flow rates of at least 1.5 gallons per minute per connection. When the system is intended to provide firefighting capability, it must also be designed to maintain a minimum pressure of 20 psi under combined fire and drinking water flow conditions as required by 30 TAC §290.44(d).
10. The contractor shall install appropriate air release devices in the distribution system at all points where topography or other factors may create air locks in the lines. All vent openings to the atmosphere shall be covered with 16-mesh or finer, corrosion resistant screening material or an acceptable equivalent as required by 30 TAC §290.44(d)(1).
11. Pursuant to 30 TAC §290.44(d)(4), accurate water meters shall be provided. Service connections and meter locations should be shown on the plans.
12. Pursuant to 30 TAC §290.44(d)(5), sufficient valves and blowoffs to make repairs. The engineering report shall establish criteria for this design.
13. Pursuant to 30 TAC §290.44(d)(6), the system shall be designed to afford effective circulation of water with a minimum of dead ends. All dead-end mains shall be provided with acceptable flush valves and discharge piping. All dead-end lines less than two inches in diameter will not require flush valves if they end at a customer service. Where dead ends are necessary as a stage in the growth of the system, they shall be located and arranged to ultimately connect the ends to provide circulation.
14. The contractor shall maintain a minimum separation distance in all directions of nine feet between the proposed waterline and wastewater collection facilities including manholes and septic tank drainfields. If this distance cannot be maintained, the contractor must immediately notify the project engineer for further direction. Separation distances, installation methods, and materials utilized must meet 30 TAC §290.44(e)(1- 4) of the current rules.
15. Pursuant to 30 TAC §290.44(e)(5), the separation distance from a potable waterline to a wastewater main or lateral manhole or cleanout shall be a minimum of nine feet. Where the nine-foot separation distance cannot be achieved, the potable waterline shall be encased in a joint of at least 150 psi pressure class pipe at least 18 feet long and two nominal sizes larger than the new conveyance. The space around the carrier pipe shall be supported at five-foot intervals with spacers or be filled to the springline with washed sand. The encasement pipe shall be centered on the crossing and both ends sealed with cement grout or manufactured sealant.
16. Pursuant to 30 TAC §290.44(e)(6), fire hydrants shall not be installed within nine feet vertically or horizontally of any wastewater line, wastewater lateral, or wastewater service line regardless of construction.
17. Pursuant to 30 TAC §290.44(e)(7), suction mains to pumping equipment shall not cross wastewater mains, wastewater laterals, or wastewater service lines. Raw water supply lines shall not be installed within five feet of any tile or concrete wastewater main, wastewater lateral, or wastewater service line.
18. Pursuant to 30 TAC §290.44(e)(8), waterlines shall not be installed closer than ten feet to septic tank drainfields.
19. Pursuant to 30 TAC §290.44(f)(1), the contractor shall not place the pipe in water or where it can be flooded with water or sewage during its storage or installation.
20. Pursuant to 30 TAC §290.44(f)(2), when waterlines are laid under any flowing or intermittent stream or semi-permanent body of water the water main shall be installed in a separate watertight pipe encasement. Valves must be provided on each side of the crossing with facilities to allow the underwater portion of the system to be isolated and tested.
21. The contractor shall disinfect the new water mains in accordance with AWWA Standard C-651 and then flush and sample the lines before being placed into service. Samples shall be collected for microbiological analysis to check the effectiveness of the disinfection procedure which shall be repeated if contamination persists. A minimum of one sample for each 1,000 feet of completed water line will be required or at the next available sampling point beyond 1,000 feet as designated by the design engineer, in accordance with 30 TAC §290.44(f)(3).

CITY OF GEORGETOWN GENERAL NOTES

1. These construction plans were prepared, sealed, signed and dated by a Texas Licensed Professional Engineer. Therefore based on the engineer's concurrence of compliance, the construction plans for construction of the proposed project are hereby approved subject to the standard Construction Specifications and Details Manual and all other applicable City, State and Federal Requirements and Codes.
2. This project is subject to all City Standard Specifications and Details in effect at the time of submittal of the project to the City.
3. The site construction plans shall meet all requirements of the approved site plan.
4. Wastewater mains and service lines shall be SDR 26 PVC.
5. Wastewater mains shall be installed without horizontal or vertical bends.
6. Maximum distance between wastewater manholes is 500 feet.
7. Wastewater mains shall be low pressure air tested and mandrel tested by the contractor according to the City of Georgetown and TCEQ requirements.
8. Wastewater manholes shall be vacuum tested and coated by the contractor according to City of Georgetown and TCEQ requirements.
9. Wastewater mains shall be camera tested by the contractor and submitted to the City on DVD format prior to paving the streets.
10. Private water system fire lines shall be tested by the contractor to 200 psi for 2 hours.
11. Private water system fire lines shall be ductile iron piping from the water main to the building sprinkler system, and 200 psi C900 PVC for all others.
12. Public water system mains shall be 150 psi C900 PVC and tested by the contractor at 150 psi for 4 hours.
13. All bends and changes in direction on water mains shall be restrained and thrust blocked.
14. Long fire hydrant leads shall be restrained.
15. All water lines are to be bacteria tested by the contractor according to the City standards and specifications.
16. Water and Sewer main crossings shall meet all requirements of the TCEQ and the City.
17. Flexible base material for public streets shall be TXDOT Type A Grade 1.
18. Hot mix asphaltic concrete pavement shall be Type D unless otherwise specified and shall be a minimum of 2 inches thick on public streets and roadways.
19. All sidewalk ramps and sidewalks not intended to be constructed with the individual houses shall be installed with the public infrastructure.
20. A maintenance bond is required to be submitted to the City prior to acceptance of the public improvements. This bond shall be established for 2 years in the amount of 10% of the cost of the public improvements and shall follow the City format.
21. Record drawings of the public improvements shall be submitted to the City by the design engineer prior to acceptance of the project. These drawings shall be TIFF or PDF (300 dpi).

GENERAL CONSTRUCTION NOTES

1. Prior to beginning construction, the Owner or his authorized representative, shall convene a Pre-Construction Conference between the City of Georgetown, Engineer, Contractor, County Engineer (if applicable), Texas Commission on Environmental Quality Field Office, and any other affected parties. Notify all such parties at least 48 hours prior to the time of the conference and 48 hours prior to beginning construction.
2. Any existing utilities, pavement, curbs, and/or sidewalks damaged or removed shall be repaired by the Contractor at his expense before acceptance of the project.
3. The location of any existing water, wastewater lines or other utilities shall be verified by the City of Georgetown & other utility providers prior to construction.
4. Manhole frames, covers, water valve covers, etc., shall be raised to finished pavement grade at the Contractor's expense by a qualified contractor with City inspection. All utility adjustments shall be completed prior to final paving construction.
5. Steger Bizzell has endeavored to design these plans compliant with ADA/TDLR and other accessibility requirements. However, the contractor shall not be relieved of any responsibility for constructing these improvements compliant with all applicable accessibility standards. If the contractor notices any discrepancies between these plans and accessibility laws/rules, he is to stop work in the area of conflict and notify Steger Bizzell immediately for a resolution and/or revision to these plans. Steger Bizzell shall not be held responsible for constructing this site compliant with accessibility laws/rules regardless of what is shown in these plans.
6. Topography based upon LiDAR survey dated January 18, 2022 by McKim and Creed. The contractor shall notify the design engineer in writing of any discrepancies discovered during construction prior to proceeding.

TEMPORARY EROSION CONTROL NOTES

1. The Contractor shall install erosion/sedimentation controls and tree protective fencing prior to any site preparation work (clearing grubbing or excavation).
2. The placement of erosion/sedimentation controls shall be in accordance with the EROSION & SEDIMENTATION CONTROL PLAN
3. Any significant variation in materials or locations of controls or fences from those shown on the approved plans must be approved by the City Engineer.
4. The Contractor is required to inspect all controls and fences at weekly intervals and after significant rainfall events to insure that they are functioning properly. The person(s) responsible for maintenance of controls and fences shall immediately make any necessary repairs to damaged areas. Silt accumulation at controls must be removed when the depth reaches six (6) inches.
5. Prior to final acceptance, haul roads and waterway crossings constructed for temporary Contractor access must be removed, accumulated sediment removed from the waterway and the area restored to the original grade and revegetated. All land clearing debris shall be disposed of in approved spoil disposal sites.
6. Field revisions to the EROSION & SEDIMENTATION CONTROL PLAN required by the Engineer or field inspector with the Texas Commission may be on Environmental Quality (TCEQ) during the course of construction to correct control inadequacies. Major revisions must be approved by the (TCEQ).

PERMANENT EROSION CONTROL NOTES

1. All disturbed areas shall be restored as noted below:
   a. A minimum of four inches of imported sandy loam topsoil or approved equal shall be placed in all drainage channels (except rock) and on all cleared areas.
   b. Grass areas may be sodded, plugged, sprigged or seeded except that solid sod shall be used in swales or other areas subject to erosion.

   The seeding for permanent erosion control shall be applied over areas disturbed by construction as follows, unless specified elsewhere:
   i. From September 15 to March 1, seeding shall be with a combination of 1 pound per 1,000 square feet of unhulled Bermuda and 7 pounds per 1,000 square feet of Winter Rye with a purity of 95% with 90% germination.
   ii. From March 2 to September 14, seeding shall be with hulled Bermuda at a rate of 3 pounds per 1,000 square feet with a purity of 95% with 85% germination.
   c. Fertilizer shall be slow release granular or pelleted type and shall have an analysis of 15-15-15 and shall be applied at the rate of 23 pounds per acre once at the time of planting and again once during the time of establishment.
   d. All planted areas shall be provided with a readily available water supply and watered as necessary to ensure continuous healthy growth and development. The planted area shall be irrigated or sprinkled in a manner that will not erode the top soil, but will sufficiently soak the soil to a depth of six inches. The irrigation shall occur at ten-day intervals during the first two months. Rainfall occurrences of 1/2 inch or more shall postpone the watering schedule for one week.
   e. Mulch type used shall be Mulch, applied at a rate of 1,500 pounds per acre.
2. Disturbed areas within areas to become public shall be re-vegetated to the City of Georgetown requirements. See section G7 of the City of Georgetown Specifications.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY WATER POLLUTION ABATEMENT PLAN GENERAL CONSTRUCTION NOTES

1. Written construction notification must be given to the appropriate TCEQ regional office no later than 48 hours prior to commencement of the regulated activity. Information must include the date on which the regulated activity will commence, the name of the approved plan for the regulated activity, and the name of the prime contractor and the name and telephone number of the contact person.
2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.
3. If any sensitive feature is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. The regulated activities near the sensitive feature may not proceed until the TCEQ has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality.
4. No temporary aboveground hydrocarbon and hazardous substance storage tank system is installed within 150 feet of a domestic, industrial, irrigation, or public water supply well, or other sensitive feature.
5. Prior to commencement of construction, all temporary erosion and sedimentation (E&S) control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. Controls specified in the temporary storm water section of the approved Edwards Aquifer Protection Plan are required during construction. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.
6. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
7. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake must be provided that can indicate when the sediment occupies 50% of the basin volume.
8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).
9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.
10. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.
11. The following records shall be maintained and made available to the TCEQ upon request: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.
12. The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:
    A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;
    B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;
    C. any development of land previously identified as undeveloped in the original water pollution abatement plan.

Austin Regional Office
12100 Park 35 Circle
Building A, 1st Floor
Austin, Texas 78753
Phone (512) 339-2929
Fax (512) 339-3795

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

NO.	REVISION	BY	DATE

SJT — DESIGNED BY: — 8-10-2022 DATE
BLM, SJT — DRAWN BY: — 8-16-2022 DATE
SJT — CHECKED BY: — 8-19-2022 DATE
BEM — APPROVED BY: — 8-22-2022 DATE

STATE OF TEXAS — BRYAN ERIC MOORE — 98920 — LICENSED PROFESSIONAL ENGINEER — 08/24/2023

STEGER BIZZELL

ADDRESS 1978 S. AUSTIN AVENUE | GEORGETOWN, TX 78626
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SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

GENERAL NOTES (1 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 02 of 93

P:\22000-22999\22226 Sun City\21-Madison Tract\02 WEST\01 PHASE A\CAD\Plans\02 GENERAL NOTES (1 OF 2).dwg Aug 18, 2023 - 3:03pm

2023-19-CON

Texas Commission on Environmental Quality
Organized Sewage Collection System
General Construction Notes

1. This Organized Sewage Collection System (SCS) must be constructed in accordance with 30 Texas Administrative Code (TAC) §213.5(c), the Texas Commission on Environmental Quality's (TCEQ) Edwards Aquifer Rules and any local government standard specifications.

2. All contractors conducting regulated activities associated with this proposed regulated project must be provided with copies of the SCS plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors must be required to keep on-site copies of the plan and the approval letter.

3. A written notice of construction must be submitted to the presiding TCEQ regional office at least 48 hours prior to the start of any regulated activities. This notice must include:
   - the name of the approved project;
   - the activity start date; and
   - the contact information of the prime contractor.

4. Any modification to the activities described in the referenced SCS application following the date of approval may require the submittal of an SCS application to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval.

5. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the manufacturers specifications. These controls must remain in place until the disturbed areas have been permanently stabilized.

6. If any sensitive features are discovered during the wastewater line trenching activities, all regulated activities near the sensitive feature must be suspended immediately. The applicant must immediately notify the appropriate regional office of the TCEQ of the feature discovered. A geologist's assessment of the location and extent of the feature discovered must be reported to that regional office in writing and the applicant must submit a plan for ensuring the structural integrity of the sewer line or for modifying the proposed collection system alignment around the feature. The regulated activities near the sensitive feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality while maintaining the structural integrity of the line.

7. Sewer lines located within or crossing the 5-year floodplain of a drainage way will be protected from inundation and stream velocities which could cause erosion and scouring of backfill. The trench must be capped with concrete to prevent scouring of backfill, or the sewer lines must be encased in concrete. All concrete shall have a minimum thickness of 6 inches.

8. Blasting procedures for protection of existing sewer lines and other utilities will be in accordance with the National Fire Protection Association criteria. Sand is not allowed as bedding or backfill in trenches that have been blasted. If any existing sewer lines are damaged, the lines must be repaired and retested.

9. All manholes constructed or rehabilitated on this project must have watertight size on size resilient connectors allowing for differential settlement. If manholes are constructed within the 100-year floodplain, the cover must have a gasket and be bolted to the ring. Where gasketed manhole covers are required for more than three manholes in sequence or for more than 1500 feet, alternate means of venting will be provided. Bricks are not an acceptable construction material for any portion of the manhole.

   The diameter of the manholes must be a minimum of four feet and the manhole for entry must have a minimum clear opening diameter of 30 inches. These dimensions and other details showing compliance with the commission's rules concerning manholes and sewer line/manhole inverts described in 30 TAC §217.55 are included on Plan Sheets 71& 72.

   It is suggested that entrance into manholes in excess of four feet deep be accomplished by means of a portable ladder. The inclusion of steps in a manhole is prohibited.

10. Where water lines and new sewer line are installed with a separation distance closer than nine feet (i.e., water lines crossing wastewater lines, water lines paralleling wastewater lines, or water lines next to manholes) the installation must meet the requirements of 30 TAC §217.53(d) (Pipe Design) and 30 TAC §290.44(e) (Water Distribution).

11. Where sewers lines deviate from straight alignment and uniform grade all curvature of sewer pipe must be achieved by the following procedure which is recommended by the pipe manufacturer: NOT APPLICABLE.

    If pipe flexure is proposed, the following method of preventing deflection of the joint must be used: NOT APPLICABLE.

    Specific care must be taken to ensure that the joint is placed in the center of the trench and properly bedded in accordance with 30 TAC §217.54.

12. New sewage collection system lines must be constructed with stub outs for the connection of anticipated extensions. The location of such stub outs must be marked on the ground such that their location can be easily determined at the time of connection of the extensions. Such stub outs must be manufactured wyes or tees that are compatible in size and material with both the sewer line and the extension. At the time of original construction, new stub-outs must be constructed sufficiently to extend beyond the end of the street pavement. All stub-outs must be sealed with a manufactured cap to prevent leakage. Extensions that were not anticipated at the time of original construction or that are to be connected to an existing sewer line not furnished with stub outs must be connected using a manufactured saddle and in accordance with accepted plumbing techniques.

    If no stub-out is present an alternate method of joining laterals is shown in the detail on Plan Sheet 71. (For potential future laterals).

    The private service lateral stub-outs must be installed as shown on the plan and profile sheets on Plan Sheets 63-64 and marked after backfilling as shown in the detail on Plan Sheet 72.

13. Trenching, bedding and backfill must conform with 30 TAC §217.54. The bedding and backfill for flexible pipe must comply with the standards of ASTM D-2321, Classes IA, IB, II or III. Rigid pipe bedding must comply with the requirements of ASTM C 12 (ANSI A 106.2) classes A, B or C.

14. Sewer lines must be tested from manhole to manhole. When a new sewer line is connected to an existing stub or clean-out, it must be tested from existing manhole to new manhole. If a stub or clean-out is used at the end of the proposed sewer line, no private service attachments may be connected between the last manhole and the cleanout unless it can be certified as conforming with the provisions of 30 TAC §213.5(c)(3)(E).

15. All sewer lines must be tested in accordance with 30 TAC §217.57. The engineer must retain copies of all test results which must be made available to the executive director upon request. The engineer must certify in writing that all wastewater lines have passed all required testing to the appropriate regional office within 30 days of test completion and prior to use of the new collection system. Testing method will be:

15.a. For a collection system pipe that will transport wastewater by gravity flow, the design must specify an infiltration and exfiltration test or a low-pressure air test. A test must conform to the following requirements:

15.a.1. Low Pressure Air Test.

15.a.1.A. A low pressure air test must follow the procedures described in American Society For Testing And Materials (ASTM) C-828, ASTM C-924, or ASTM F-1417 or other procedure approved by the executive director, except as to testing times as required in Table C.3 in subparagraph (C) of this paragraph or Equation C.3 in subparagraph (B)(ii) of this paragraph.

15.a.1.B. For sections of collection system pipe less than 36 inch average inside diameter, the following procedure must apply, unless a pipe is to be tested as required by paragraph (2) of this subsection.

15.a.1.B.1. A pipe must be pressurized to 3.5 pounds per square inch (psi) greater than the pressure exerted by groundwater above the pipe.

15.a.1.B.2. Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 psi gauge to 2.5 psi gauge is computed from the following equation:

Equation C.3 $$T = \frac{0.085 \times D \times K}{Q}$$

Where:

T = time for pressure to drop 1.0 pound per square inch gauge in seconds
K = 0.000419 X D X L, but not less than 1.0
D = average inside pipe diameter in inches
L = length of line of same size being tested, in feet
Q = rate of loss, 0.0015 cubic feet per minute per square foot internal surface

15.a.1.C. Since a K value of less than 1.0 may not be used, the minimum testing time for each pipe diameter is shown in the following Table C.3:

Pipe Diameter *(inches)*	Minimum Time *(seconds)*	Maximum Length for Minimum Time *(feet)*	Time for Longer Length *(seconds/foot)*
6	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.309
30	1700	80	21.369
33	1870	72	25.856

15.a.1.D. An owner may stop a test if no pressure loss has occurred during the first 25% of the calculated testing time.

15.a.1.E. If any pressure loss or leakage has occurred during the first 25% of a testing period, then the test must continue for the entire test duration as outlined above or until failure.

15.a.1.F. Wastewater collection system pipes with a 27 inch or larger average inside diameter may be air tested at each joint instead of following the procedure outlined in this section.

15.a.1.G. A testing procedure for pipe with an inside diameter greater than 33 inches must be approved by the executive director.

15.a.2. Infiltration/Exfiltration Test.

15.a.2.A. The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch of diameter per mile of pipe per 24 hours at a minimum test head of 2.0 feet above the crown of a pipe at an upstream manhole.

15.a.2.B. An owner shall use an infiltration test in lieu of an exfiltration test when pipes are installed below the groundwater level.

15.a.2.C. The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of two feet above the crown of a pipe at an upstream manhole, or at least two feet above existing groundwater level, whichever is greater.

15.a.2.D. For construction within a 25-year flood plain, the infiltration or exfiltration must not exceed 10 gallons per inch diameter per mile of pipe per 24 hours at the same minimum test head as in subparagraph (C) of this paragraph.

15.a.2.E. If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, an owner shall undertake remedial action in order to reduce the infiltration or exfiltration to an amount within the limits specified. An owner shall retest a pipe following a remediation action.

15.b. If a gravity collection pipe is composed of flexible pipe, deflection testing is also required. The following procedures must be followed:

15.b.1. For a collection pipe with inside diameter less than 27 inches, deflection measurement requires a rigid mandrel.

15.b.1.A. Mandrel Sizing.

15.b.1.A.1. A rigid mandrel must have an outside diameter (OD) not less than 95% of the base inside diameter (ID) or average ID of a pipe, as specified in the appropriate standard by the ASTMs, American Water Works Association, UNI-BELL, or American National Standards Institute, or any related appendix.

15.b.1.A.2. If a mandrel sizing diameter is not specified in the appropriate standard, the mandrel must have an OD equal to 95% of the ID of a pipe. In this case, the ID of the pipe, for the purpose of determining the OD of the mandrel, must equal be the average outside diameter minus two minimum wall thicknesses for OD controlled pipe and the average inside diameter for ID controlled pipe.

15.b.1.A.3. All dimensions must meet the appropriate standard.

15.b.1.B. Mandrel Design.

15.b.1.B.1. A rigid mandrel must be constructed of a metal or a rigid plastic material that can withstand 200 psi without being deformed.

15.b.1.B.2. A mandrel must have nine or more odd number of runners or legs.

15.b.1.B.3. A barrel section length must equal at least 75% of the inside diameter of a pipe.

15.b.1.B.4. Each size mandrel must use a separate proving ring.

15.b.1.C. Method Options.

15.b.1.C.1. An adjustable or flexible mandrel is prohibited.

15.b.1.C.2. A test may not use television inspection as a substitute for a deflection test.

15.b.1.C.3. If requested, the executive director may approve the use of a deflectometer or a mandrel with removable legs or runners on a case-by-case basis.

15.b.2. For a gravity collection system pipe with an inside diameter 27 inches and greater, other test methods may be used to determine vertical deflection.

15.b.3. A deflection test method must be accurate to within plus or minus 0.2% deflection.

15.b.4. An owner shall not conduct a deflection test until at least 30 days after the final backfill.

15.b.5. Gravity collection system pipe deflection must not exceed five percent (5%).

15.b.6. If a pipe section fails a deflection test, an owner shall correct the problem and conduct a second test after the final backfill has been in place at least 30 days.

16. All manholes must be tested to meet or exceed the requirements of 30 TAC §217.58.

16.a. All manholes must pass a leakage test.

16.b. An owner shall test each manhole (after assembly and backfilling) for leakage, separate and independent of the collection system pipes, by hydrostatic exfiltration testing, vacuum testing, or other method approved by the executive director.

16.b.1. Hydrostatic Testing.

16.b.1.A. The maximum leakage for hydrostatic testing or any alternative test methods is 0.025 gallons per foot diameter per foot of manhole depth per hour.

16.b.1.B. To perform a hydrostatic exfiltration test, an owner shall seal all wastewater pipes coming into a manhole with an internal pipe plug, fill the manhole with water, and maintain the test for at least one hour.

16.b.1.C. A test for concrete manholes may use a 24-hour wetting period before testing to allow saturation of the concrete.

16.b.2. Vacuum Testing.

16.b.2.A. To perform a vacuum test, an owner shall plug all lift holes and exterior joints with a non-shrink grout and plug all pipes entering a manhole.

16.b.2.B. No grout must be placed in horizontal joints before testing.

16.b.2.C. Stub-outs, manhole boots, and pipe plugs must be secured to prevent movement while a vacuum is drawn.

16.b.2.D. An owner shall use a minimum 60 inch/lb torque wrench to tighten the external clamps that secure a test cover to the top of a manhole.

16.b.2.E. A test head must be placed at the inside of the top of a cone section, and the seal inflated in accordance with the manufacturer's recommendations.

16.b.2.F. There must be a vacuum of 10 inches of mercury inside a manhole to perform a valid test.

16.b.2.G. A test does not begin until after the vacuum pump is off.

16.b.2.H. A manhole passes the test if after 2.0 minutes and with all valves closed, the vacuum is at least 9.0 inches of mercury.

17. All private service laterals must be inspected and certified in accordance with 30 TAC §213.5(c)(3)(I). After installation of and, prior to covering and connecting a private service lateral to an existing organized sewage collection system, a Texas Licensed Professional Engineer, Texas Registered Sanitarian, or appropriate city inspector must visually inspect the private service lateral and the connection to the sewage collection system, and certify that it is constructed in conformity with the applicable provisions of this section. The owner of the collection system must maintain such certifications for five years and forward copies to the appropriate regional office upon request. Connections may only be made to an approved sewage collection system.

Austin Regional Office
12100 Park 35 Circle, Building A
Austin, Texas 78753-1808
Phone (512) 339-2929
Fax (512) 339-3795

THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.

MANHOLE TESTING

All manholes must pass a leakage test. An owner shall test each manhole (after assembly and backfilling) for leakage, separate and independent of the collection system pipes, by hydrostatic exfiltration testing, vacuum testing, or other method approved by the executive director.

HYDROSTATIC TESTING

The maximum leakage for hydrostatic testing or any alternative test methods is 0.025 gallons per foot diameter per foot of manhole depth per hour. To perform a hydrostatic exfiltration test, an owner shall seal all wastewater pipes coming into a manhole with an internal pipe plug, fill the manhole with water and maintain the test for at least one hour. A test for concrete manholes may use a 24 hour wetting period before testing to allow saturation of the concrete.

VACUUM TESTING

To perform a vacuum test, an owner shall plug all lift holes and exterior joints with a non-shrink grout and plug all pipes entering a manhole. No grout must be placed in horizontal joints before testing. Stub outs, manhole boots and pipe plugs must be secured to prevent movement while a vacuum is drawn. An owner shall use a minimum 60 inch/lb torque wrench to tighten the external clamps that secure a test cover to the top of a manhole. A test head must be placed at the inside of the top of a cone section and the seal inflated in accordance with the manufacturer's recommendations. There must be a vacuum of 10 inches of mercury inside a manhole to perform a valid test. A test does not begin until after the vacuum pump is off. A manhole passes the test if after 2.0 minutes and with all valves closed, the vacuum is a least 9.0 inches of mercury.

ADDITIONAL WASTEWATER NOTES

1. If a conflict exists between the various documents, the documents will take precedence in the following order:
   a. Municipal Utility Specifications
   b. Change Orders
   c. Addenda Issue During Bidding
   d. Construction Plans
   e. Project Specifications

2. The following pipe diameters, pipe material and national standard specifications are proposed for this project:

PIPE DIAMETER (IN)	LINEAR FEET (FT)	PIPE MATERIAL	NATIONAL STANDARD FOR PIPE MATERIAL	NATIONAL STANDARD FOR PIPE JOINTS
6	1075	PVC SDR-26	ASTM D 3034	ASTM D 3212
8	3942	PVC SDR-26	ASTM D 3034	ASTM D 3212
8	200	PVC DR-18	ASTM D 1784	ASTM D 3139

3. Watertight, size on size resilient connectors conforming to ASTM C 923 must be used for connecting pipe to manholes.

4. The bedding class for each diameter of flexible pipe and each flexible pipe material is as follows:

PIPE DIAMETER (IN)	PIPE MATERIAL	BEDDING CLASS
8	PVC SDR-26/DR-18	1B

5. Brick manhole construction is not allowed. Use of brick for adjusting manhole covers to grade is also prohibited.

6. All manholes shall be of precast concrete construction.

7. The structural integrity of the collection line due to high soil P.I.'s will require the bedding around the pipe to be 6" minimum below the pipe, 6" minimum on each side of the pipe, and 12" minimum above the pipe.

8. If faults, caverns, or subsidence are discovered during construction, construction shall be halted to allow the features to be inspected by the design engineer or a geological or geotechnical engineer. Based on this inspection, revisions approval to the design may be required.

9. The trench walls shall be vertical to at least one foot above the pipe.

10. The trench backfill shall be free of stones greater than 6 inches in diameter and free of organic or any other unstable material.

11. Manholes shown on the plans with sealed and gasketed covers are provided as protection against inflow for those manholes which lie 1) within a 100 year flood plain, 2) lie with a drainageway, 3) lie within a street subject to carrying drainage flows, and 4) additional locations as determined necessary by the Engineer.

12. No drop connections are proposed in these plans.

13. The minimum allowable tensile strength and cell class for each flexible pipe shall be as follows:

PIPE MATERIAL	TENSILE STRENGTH	CELL CLASS (PVC ONLY)
SDR-26	7,000	12454-B
PS-115	7,000	12454-B

14. All gravity lines utilizing flexible pipe must be tested for deflection by pulling a rigid mandrel through the installed pipe. The test must be conducted at least 30 days after placement and compaction of final backfill. No pipe shall exceed a deflection of 5 rigid mandrel shall be used to measure deflection. The test must be performed without mechanical pulling devices. The mandrel's minimum outside diameter is 95 inside diameter. The mandrel must have an odd number of runners, totaling nine or more. The barrel section of the mandrel must have a length at least 75 inside diameter. A TV test cannot substitute for the deflection test.

15. A leakage test is required for all gravity lines. For line that is not horizontally curved, a hydrostatic test and/or a low pressure air test must be performed on all proposed gravity sanitary sewer collection piping. These tests must comply with Section 217.57(a) of the TCEQ's rules. The contractor shall have the option of utilizing either a hydrostatic test or a low pressure air test.

16. Manholes must be tested for leakage. Manholes will be tested with a hydrostatic test, or with a vacuum test, Contractor's Option.

17. The hydrostatic manhole test shall comply with the test requirements detailed in Section 217.58(b)(1) of the TCEQ's rules.

18. Each manhole shall be tested immediately after assembly and prior to backfilling. Manholes which have been backfilled shall either be excavated to expose the entire exterior prior to vacuum testing or the manhole shall be tested for leakage by means of a hydrostatic test.

19. All lift holes and exterior joints shall be plugged with an approved non-shrink grout.

20. No grout shall be placed in horizontal joints before testing.

21. All pipes entering the manhole shall be plugged, taking care to securely brace the plugs from being drawn into the manhole.

22. Stubouts, manhole boots and pipe plugs shall be secured to prevent movement while the vacuum is drawn.

23. A minimum 60-inch/lb torque wrench shall be used to tighten the external clamps that secure the test cover to the top of the manhole.

24. The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendation.

25. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches of mercury. The manhole shall pass if the time is greater than 2 minutes. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. If the manhole fails a second time, repairs should again be made and the manhole shall be tested by means of a hydrostatic test which complies with Section 217.58(b)(1) of the TCEQ's rules. If any manhole fails the hydrostatic test, after failing the vacuum test twice, the contractor should consider replacing that manhole. If the contractor chooses to attempt to repair that manhole, the manhole must be retested by means of the hydrostatic test outlined in Section 217.58(b)(1) of the TCEQ's rules, until it passes.

26. Inspection must be provided during critical phases of construction by a qualified inspector under the direction of a P.E. Critical phases of construction are deemed at a minimum to include testing of pipe and manholes for leakage, testing of flexible pipe for installed deflection, and any other as directed by the City. The City and design engineer shall provide inspection as appropriate.

27. TCEQ approval letters for plans and specifications review contain the requirement that once the project is completed, a P.E. registered in the state of Texas must certify that the construction was performed substantially in accordance with the approved plans and specifications. If flexible pipe was installed, a P.E. must also certify that all pipe was subjected to and passed the required deflection test. The design engineer, with concurrence of the City, will certify the installation.

28. The project plans and specifications must ensure that the pipe installation will adhere to the minimum separation distances allowed by 217.53 (d), TCEQ's rules.

    Separation Distances.
    The following rules apply to separation distances between potable water and wastewater treatment plants, and waterlines and sanitary sewers.

    (a) Water line/new sewer line separation. When new sanitary sewers are installed, they shall be installed no closer to waterlines than nine feet in all directions. Sewers that parallel waterlines must be installed in separate trenches. Where the nine foot separation distance cannot be achieved, the following guidelines will apply:
    (b) SDF

    (1) Where a sanitary sewer parallels a waterline, the sewer shall be constructed of cast iron, ductile iron or PVC meeting ASTM specifications with a pressure rating for both the pipe and joints of 150 psi. The vertical separation shall be a minimum of two feet between outside diameters and the horizontal separation shall be a minimum of four feet between outside diameters. The sewer shall be located below the waterline.
    (2) Where a sanitary sewer crosses a waterline and the sewer is constructed of cast iron, ductile iron or PVC with a minimum pressure rating of 150 psi, an absolute minimum distance of 6 inches between outside diameters shall be maintained. In addition the sewer shall be located below the waterline where possible and one length of the sewer pipe must be centered on the waterline.
    (3) Where a sewer crosses under a waterline and the sewer is con- structed of ABS truss pipe, similar semi-rigid plastic composite pipe, clay pipe or concrete pipe with gasketed joints, a minimum two foot separation distance shall be maintained. The initial backfill shall be cement stabilized sand (two or more bags of cement per cubic yard of sand) for all sections of sewer within nine feet of the waterline. This initial backfill shall be from one quarter diameter below the centerline of the pipe to one pipe diameter (but not less than 12 inches) above the top of the pipe.
    (4) Where a sewer crosses over a waterline all portions of the sewer within nine feet of the waterline shall be constructed of cast iron, ductile iron, or PVC pipe with a pressure rating of at least 150 psi using appropriate adapters. In lieu of this procedure the new conveyance may be encased in a joint of 150 psi pressure class pipe at least 18 feet long and two nominal sizes larger than the new conveyance. The space around the carrier pipe shall be supported at 5 feet intervals with spacers or be filled to the springline with washed sand. The encasement pipe should be centered on the crossing and both ends sealed with cement grout or manufactured seal.

    b) Water line/manhole separation. Unless sanitary sewer manholes and the connecting sewer can be made watertight and tested for no leakage, they must be installed so as to provide a minimum of nine feet of horizontal clearance from an existing or proposed waterline. Where the nine foot separation distance cannot be achieved, a carrier pipe as des- cribed in subsection (a)(4) of this section may be used where appropriate.

The separation distance between any unknown water lines which are discovered during the installation phase of the project, and, the gravity sanitary sewer pipe which will be installed, shall be sufficient to comply with the minimum separation distances allowed by 217.53(d) of the TCEQ's rules as stated above.

29. AN EROSION and SEDIMENTATION CONTROL PLAN is included with these plans. These provisions are intended to control erosion and sedimentation due to runoff during construction. These provisions must be installed prior to any other construction activities.

30. It is the intent of this project that portable ladders be used to access manholes during construction by the Contractor as well as for maintenance purposes after construction is complete by the City.

31. It is the intent of this project that personal gas detectors are required for wear by all personnel whose jobs require entering enclosed spaces (such as manholes and lift stations) capable of accumulations of hydrogen sulfide or other harmful gases. It shall be the responsibility of the Contractor to ensure these detectors are provided to the appropriate personnel during the construction of this project. It shall be the responsibility of the City to ensure these detectors are provided to the appropriate personnel during the maintenance of this project after construction.

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

NO.	REVISION	BY	DATE

SJT — DESIGNED BY: 8-10-2022 DATE
BLM, SJT — DRAWN BY: 8-16-2022 DATE
SJT — CHECKED BY: 8-19-2022 DATE
BEM — APPROVED BY: 8-22-2022 DATE

STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED · PROFESSIONAL ENGINEER · 08/24/2023

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SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

GENERAL NOTES (2 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21
SHEET 03 of 93

2023-19-CON

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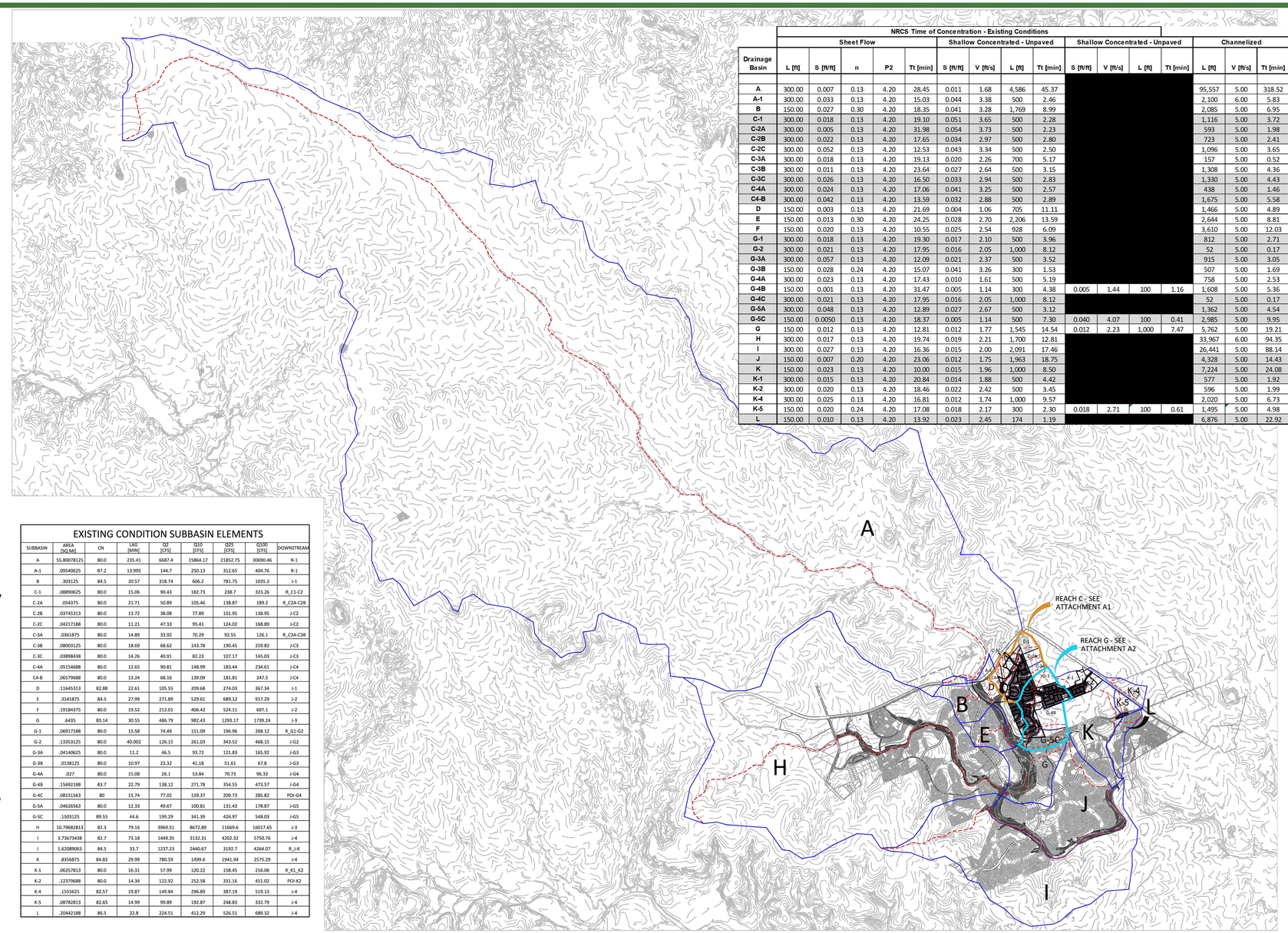
0 4000 8000 Feet

SCALE: 1" = 4000'



Legend

- Tc Route
- Basin Boundary

NOTE:
SHADED AREA REPRESENTS DEVELOPMENT WITHIN THIS STUDY.

EXISTING CONDITION SUBBASIN ELEMENTS

SUBBASIN	AREA [SQ.MI]	CN	LAG [MIN]	Q2 [CFS]	Q10 [CFS]	Q25 [CFS]	Q100 [CFS]	DOWNSTREAM
A	55.800781125	80.0	235.41	6687.4	15864.17	21852.75	30690.46	R-1
A-1	.09540625	87.2	13.995	144.7	250.13	312.65	404.76	R-1
B	.303125	84.5	20.57	318.74	606.2	781.75	1035.3	J-1
C-1	.08890625	80.0	15.06	90.43	182.73	238.7	323.26	R_C1-C2
C-2A	.054375	80.0	21.71	50.89	105.46	138.87	189.2	R_C2A-C2B
C-2B	.03745313	80.0	13.72	38.08	77.89	101.95	138.95	J-C2
C-2C	.04217188	80.0	11.21	47.33	95.41	124.02	168.89	J-C2
C-3A	.0361875	80.0	14.89	33.92	70.29	92.55	126.1	R_C3A-C3B
C-3B	.08001125	80.0	18.69	68.62	143.78	190.45	259.82	J-C3
C-3C	.03898438	80.0	14.26	40.91	82.23	107.17	145.03	J-C3
C-4A	.05154688	80.0	12.65	90.81	148.99	183.44	234.61	J-C4
C4-B	.06579688	80.0	13.24	68.16	139.09	181.81	247.5	J-C4
D	.11645313	82.88	22.61	105.55	209.68	274.03	367.34	J-1
E	.3141875	84.5	27.99	271.89	529.61	689.12	917.29	J-2
F	.19184375	80.0	19.52	212.01	406.42	524.11	697.1	J-2
G	.6435	83.14	30.55	486.79	982.43	1293.17	1739.24	J-3
G-1	.06917188	80.0	15.58	74.49	151.09	196.96	268.12	R_G1-G2
G-2	.13353125	80.0	40.002	126.15	261.03	343.52	468.15	J-G2
G-3A	.04140625	80.0	11.2	46.5	93.72	121.83	165.92	J-G3
G-3B	.0138125	80.0	10.97	23.32	41.18	51.61	67.8	J-G3
G-4A	.027	80.0	15.08	26.1	53.84	70.73	96.33	J-G4
G-4B	.15692188	83.7	22.79	138.12	271.78	354.55	473.57	J-G4
G-4C	.08151563	80	15.74	77.02	159.37	209.73	285.82	POI-G4
G-5A	.04626563	80.0	12.33	49.67	100.81	131.43	178.87	J-G5
G-5C	.1503125	89.55	44.6	199.29	341.39	426.97	548.03	J-G5
H	10.79682813	82.3	79.16	3969.51	8672.89	11669.6	16017.65	J-3
I	3.73673438	82.7	73.18	1449.35	3132.31	4202.32	5750.76	J-4
J	1.62089063	84.5	33.7	1237.23	2440.67	3192.7	4264.07	R_J-K
K	.8356875	84.82	29.99	780.59	1499.6	1941.94	2575.29	J-4
K-1	.06257813	80.0	16.31	57.99	120.22	158.45	216.06	R_K1_K2
K-2	.12379688	80.0	14.34	122.92	252.58	331.16	451.02	POI-K2
K-4	.1555625	82.57	19.87	149.84	296.89	387.19	519.13	J-4
K-5	.08782813	82.65	14.99	99.89	192.87	248.83	332.79	J-4
L	.20442188	86.5	22.8	224.51	412.29	526.51	689.32	J-4

NRCS Time of Concentration - Existing Conditions

Drainage Basin	Sheet Flow L [ft]	S [ft/ft]	n	P2	Tt [min]	Shallow Concentrated - Unpaved S [ft/ft]	V [ft/s]	L [ft]	Tt [min]	Shallow Concentrated - Unpaved S [ft/ft]	V [ft/s]	L [ft]	Tt [min]	Channelized L [ft]	V [ft/s]	Tt [min]	Total Tt [min]	Total Tlag [min]
A	300.00	0.007	0.13	4.20	28.45	0.011	1.68	4,586	45.37					95,557	5.00	318.52	392.35	235.41
A-1	300.00	0.033	0.13	4.20	15.03	0.044	3.38	500	2.46					2,100	6.00	5.83	23.33	14.00
B	150.00	0.027	0.30	4.20	18.35	0.041	3.28	1,769	8.99					2,085	5.00	6.95	34.29	20.57
C-1	300.00	0.018	0.13	4.20	19.10	0.051	3.65	500	2.28					1,116	5.00	3.72	25.10	15.06
C-2A	300.00	0.005	0.13	4.20	31.98	0.054	3.73	500	2.23					593	5.00	1.98	36.19	21.71
C-2B	300.00	0.022	0.13	4.20	17.65	0.034	2.97	500	2.80					723	5.00	2.41	22.86	13.72
C-2C	300.00	0.052	0.13	4.20	12.53	0.043	3.34	500	2.50					1,096	5.00	3.65	18.68	11.21
C-3A	300.00	0.018	0.13	4.20	19.13	0.020	2.26	700	5.17					157	5.00	0.52	24.82	14.89
C-3B	300.00	0.011	0.13	4.20	23.64	0.027	2.64	500	3.15					1,308	5.00	4.36	31.16	18.69
C-3C	300.00	0.026	0.13	4.20	16.50	0.033	2.94	500	2.83					1,330	5.00	4.43	23.77	14.26
C-4A	300.00	0.024	0.13	4.20	17.06	0.041	3.25	500	2.57					438	5.00	1.46	21.09	12.65
C4-B	300.00	0.042	0.13	4.20	13.59	0.032	2.88	500	2.89					1,675	5.00	5.58	22.06	13.24
D	150.00	0.003	0.13	4.20	21.69	0.004	1.06	705	11.11					1,466	5.00	4.89	37.68	22.61
E	150.00	0.013	0.30	4.20	24.25	0.028	2.70	2,206	13.59					2,644	5.00	8.81	46.65	27.99
F	150.00	0.020	0.13	4.20	10.55	0.025	2.54	928	6.09					3,610	5.00	12.03	28.67	17.20
G-1	300.00	0.018	0.13	4.20	19.30	0.017	2.10	500	3.96					812	5.00	2.71	25.97	15.58
G-2	300.00	0.021	0.13	4.20	17.95	0.016	2.05	1,000	8.12					52	5.00	0.17	26.24	15.74
G-3A	300.00	0.057	0.13	4.20	12.09	0.021	2.37	500	3.52					915	5.00	3.05	18.66	11.20
G-3B	150.00	0.028	0.24	4.20	15.07	0.041	3.26	300	1.53					507	5.00	1.69	18.29	10.97
G-4A	300.00	0.023	0.13	4.20	17.43	0.010	1.61	500	5.19					758	5.00	2.53	25.14	15.08
G-4B	150.00	0.001	0.13	4.20	31.47	0.005	1.14	300	4.38	0.005	1.44	100	1.16	1,608	5.00	5.36	42.37	25.42
G-4C	300.00	0.021	0.13	4.20	17.95	0.016	2.05	1,000	8.12					52	5.00	0.17	26.24	15.74
G-5A	300.00	0.048	0.13	4.20	12.89	0.027	2.67	500	3.12					1,362	5.00	4.54	20.56	12.33
G-5C	150.00	0.0050	0.13	4.20	18.37	0.005	1.14	500	7.30	0.040	4.07	100	0.41	2,985	5.00	9.95	36.03	21.62
G	150.00	0.012	0.13	4.20	12.81	0.012	1.77	1,545	14.54	0.012	2.23	1,000	7.47	5,762	5.00	19.21	54.02	32.41
H	300.00	0.017	0.13	4.20	19.74	0.019	2.21	1,700	12.81					33,967	6.00	94.35	126.90	76.14
I	300.00	0.027	0.13	4.20	16.36	0.015	2.00	2,091	17.46					26,441	5.00	88.14	121.96	73.18
J	150.00	0.007	0.20	4.20	23.06	0.012	1.75	1,963	18.75					4,328	5.00	14.43	56.23	33.74
K	150.00	0.023	0.13	4.20	10.00	0.015	1.96	1,000	8.50					7,224	5.00	24.08	42.58	25.55
K-1	300.00	0.015	0.13	4.20	20.84	0.014	1.88	500	4.42					577	5.00	1.92	27.19	16.31
K-2	300.00	0.020	0.13	4.20	18.46	0.022	2.42	500	3.45					596	5.00	1.99	23.89	14.34
K-4	300.00	0.025	0.13	4.20	16.81	0.012	1.74	1,000	9.57					2,020	5.00	6.73	33.12	19.87
K-5	150.00	0.020	0.24	4.20	17.08	0.018	2.17	300	2.30	0.018	2.71	100	0.61	1,495	5.00	4.98	24.99	14.99
L	150.00	0.010	0.13	4.20	13.92	0.023	2.45	174	1.19					6,876	5.00	22.92	38.03	22.82

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SJT — DESIGNED BY: — 7/10/2022 DATE
SJT — DRAWN BY: — 7/10/2022 DATE
BEM — CHECKED BY: — 7/14/2022 DATE
BEM — APPROVED BY: — 7/14/2022 DATE

STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED PROFESSIONAL ENGINEER · 07/18/2022

STEGER BIZZELL

ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

ATTACHMENT "A" - EXISTING CONDITION DRAINAGE MAP
for
BERRY CREEK
Georgetown
Williamson County, Texas

Project No: 22226-M

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

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BLM, SJT — DRAWN BY: — 8-16-2022 DATE
SJT — CHECKED BY: — 8-19-2022 DATE
BEM — APPROVED BY: — 8-22-2022 DATE

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EXISTING DRAINAGE PLAN
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 06 of 93

2023-19-CON

Legend

Tc Route

Basin Boundary

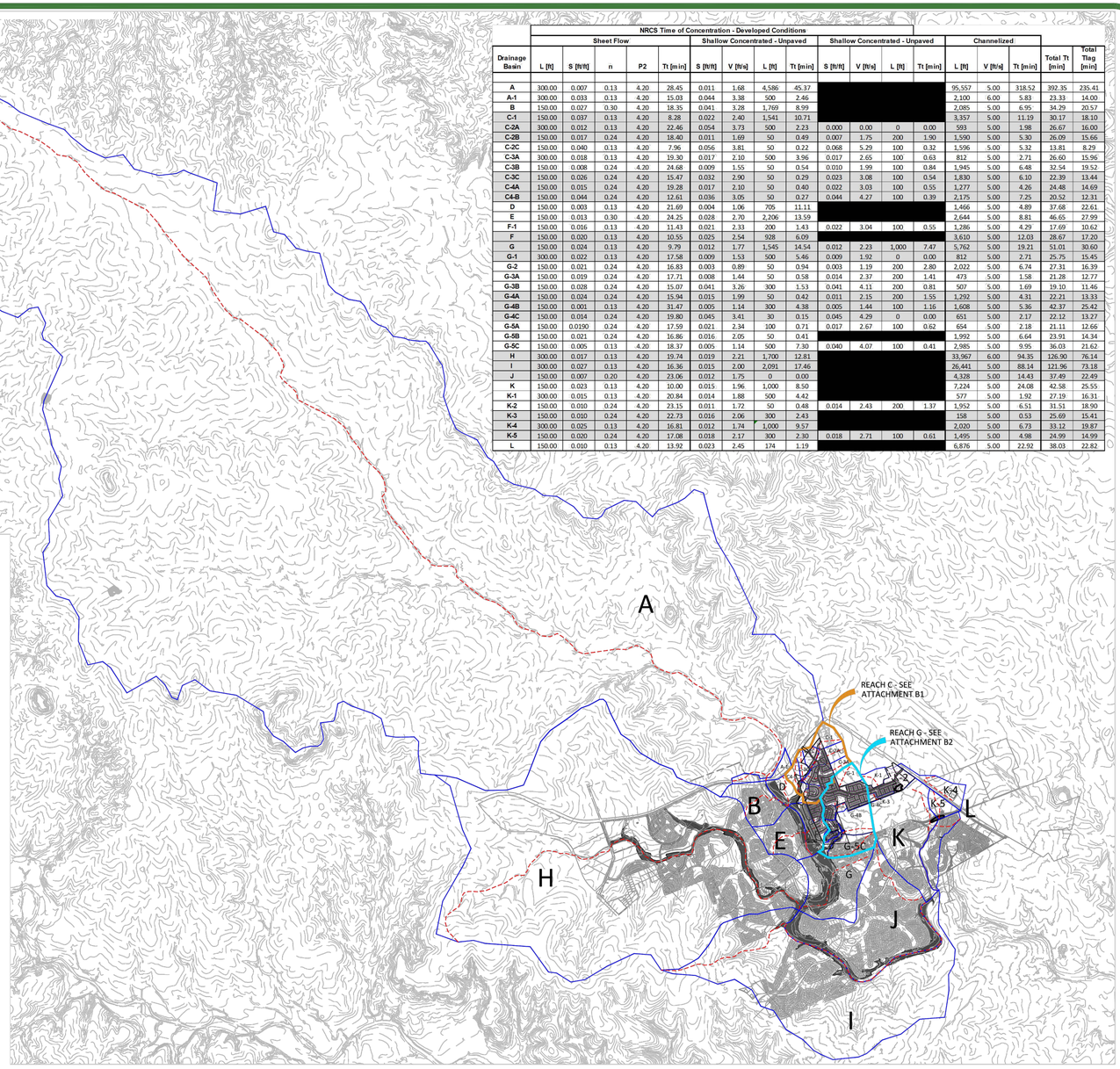
NOTE:
SHADED AREA REPRESENTS DEVELOPMENT WITHIN THIS STUDY.

PROPOSED CONDITION SUBBASIN ELEMENTS

SUBBASIN	AREA [SQ MI]	CN	LAG [MIN]	Q2 [CFS]	Q10 [CFS]	Q25 [CFS]	Q100 [CFS]	DOWNSTREAM
A	55.80078125	80.0	235.41	6687.4	15864.17	21852.75	30690.46	R-1
A-1	.09540625	87.2	13.995	144.7	250.13	312.65	404.76	R-1
B	.303125	84.5	20.57	318.74	606.2	781.75	1035.3	J-1
C-1	.08890625	80.83	15.46	81.68	167.27	220.08	298.52	R_C1-C2
C-2A	.054375	80.0	21.71	50.89	105.46	138.87	189.2	R_C2A-C2B
C-2B	.02892188	89.24	15.66	45.58	76.27	94.61	121.18	J-C2
C-2C	.04217188	87.88	11.31	84.41	136.85	167.92	215.64	J-C2
C-3A	.0361875	80.0	14.89	33.92	70.29	92.55	126.1	R_C3A-C3B
C-3B	.08770313	88.29	19.52	165.63	270.73	332.4	427.03	
C-3C	.03898438	80.84	13.44	42.2	84.41	109.76	148.45	J-C3
C-4A	.05517188	89.08	15.02	98.21	161.18	198.34	253.48	J-C4
C4-B	.06579688	80.05	12.31	70.92	143.72	187.31	254.84	J-C4
D	.11590625	84.01	22.62	111.9	216.85	281.31	374.25	J-1
E	.3141875	84.5	27.99	271.89	529.61	689.12	917.29	J-2
F	.15021875	84.83	17.61	178.49	332.09	424.71	560.06	J-2
F-1	.0445625	90.73	10.62	91.98	143.64	174.21	220.29	R_F1-F
G	.6435	83.14	30.55	486.79	982.43	1293.17	1739.24	J-3
G-1	.06917188	80.0	15.58	74.49	151.09	196.96	268.12	R_G1-G2
G-2	.176875	89.65	20.58	321.44	521.74	640.22	815.7	POND G
G-3A	.03284375	88.72	12.77	56.28	93.32	115.25	147.9	J-G3
G-3B	.01395313	84.0	10.97	22.84	41.73	52.82	69.93	J-G3
G-4A	.028	88.37	19.65	46.11	77.42	95.95	123.33	J-G4
G-4B	.15692188	83.7	22.79	138.12	271.78	354.55	473.57	J-G4
G-4C	.01028125	86.41	13.27	18.39	31.08	38.5	50.02	POI-G4
G-5A	.02059375	89.09	12.66	36.1	59.35	73.12	93.57	J-G5
G-5B	.02820313	80.4	14.34	32.82	65.75	85.24	115.96	J-G5
G-5C	.1503125	89.55	44.6	199.29	341.39	426.97	548.03	J-G5
H	10.79682813	82.3	79.16	3969.51	8672.89	11669.6	16017.65	J-3
I	3.73673438	82.7	73.18	1449.35	3132.31	4202.32	5750.76	J-4
J	1.62089063	84.5	33.7	1237.23	2440.67	3192.7	4264.07	R_J-K
K	.8356875	84.82	29.99	780.59	1499.6	1941.94	2575.29	J-4
K-1	.06257813	80.0	16.31	57.99	120.22	158.45	216.06	R_K1_K2
K-2	.12896875	90.82	18.9	196.98	324.61	401.32	510.0	POND K
K-3	.0185	83.54	12.16	21.8	41.34	53.08	70.51	POI-K2
K-4	.1555625	82.57	19.87	149.84	296.89	387.19	519.13	J-4
K-5	.08782813	82.65	14.99	99.89	192.87	248.83	332.79	J-4
L	.20442188	86.5	22.8	224.51	412.29	526.51	689.32	J-4

NRCS Time of Concentration - Developed Conditions

Drainage Basin	Sheet Flow: L [ft]	S [ft/ft]	n	P2	Tt [min]	Shallow Concentrated - Unpaved: S [ft/ft]	V [ft/s]	L [ft]	Tt [min]	Shallow Concentrated - Unpaved: S [ft/ft]	V [ft/s]	L [ft]	Tt [min]	Channelized: L [ft]	V [ft/s]	Tt [min]	Total Tt [min]	Total Tlag [min]
A	300.00	0.007	0.13	4.20	28.45	0.011	1.68	4,586	45.37					95,557	5.00	318.52	392.35	235.41
A-1	300.00	0.033	0.13	4.20	15.03	0.044	3.38	500	2.46					2,100	6.00	5.83	23.33	14.00
B	150.00	0.027	0.30	4.20	18.35	0.041	3.28	1,769	8.99					2,085	5.00	6.95	34.29	20.57
C-1	150.00	0.037	0.13	4.20	8.28	0.022	2.40	1,541	10.71					3,357	5.00	11.19	30.17	18.10
C-2A	300.00	0.012	0.13	4.20	22.46	0.054	3.73	500	2.23	0.000	0.00	0	0.00	593	5.00	1.98	26.67	16.00
C-2B	150.00	0.017	0.24	4.20	18.40	0.011	1.69	50	0.49	0.007	1.75	200	1.90	1,590	5.00	5.30	26.09	15.66
C-2C	150.00	0.040	0.13	4.20	7.96	0.056	3.81	50	0.22	0.068	5.29	100	0.32	1,596	5.00	5.32	13.81	8.29
C-3A	300.00	0.018	0.13	4.20	19.30	0.017	2.10	500	3.96	0.017	2.65	100	0.63	812	5.00	2.71	26.60	15.96
C-3B	150.00	0.008	0.24	4.20	24.68	0.009	1.55	50	0.54	0.010	1.99	100	0.84	1,945	5.00	6.48	32.54	19.52
C-3C	150.00	0.026	0.24	4.20	15.47	0.032	2.90	50	0.29	0.023	3.08	100	0.54	1,830	5.00	6.10	22.39	13.44
C-4A	150.00	0.015	0.24	4.20	19.28	0.017	2.10	50	0.40	0.022	3.03	100	0.55	1,277	5.00	4.26	24.48	14.69
C4-B	150.00	0.044	0.24	4.20	12.61	0.036	3.05	50	0.27	0.044	4.27	100	0.39	2,175	5.00	7.25	20.52	12.31
D	150.00	0.003	0.13	4.20	21.69	0.004	1.06	705	11.11					1,466	5.00	4.89	37.68	22.61
E	150.00	0.013	0.30	4.20	24.25	0.028	2.70	2,206	13.59					2,644	5.00	8.81	46.65	27.99
F-1	150.00	0.016	0.13	4.20	11.43	0.021	2.33	200	1.43	0.022	3.04	100	0.55	1,286	5.00	4.29	17.69	10.62
F	150.00	0.020	0.13	4.20	10.55	0.025	2.54	928	6.09					3,610	5.00	12.03	28.67	17.20
G	150.00	0.024	0.13	4.20	9.79	0.012	1.77	1,545	14.54	0.012	2.23	1,000	7.47	5,762	5.00	19.21	51.01	30.60
G-1	300.00	0.022	0.13	4.20	17.58	0.009	1.53	500	5.46	0.009	1.92	0	0.00	812	5.00	2.71	25.75	15.45
G-2	150.00	0.021	0.24	4.20	16.83	0.003	0.89	50	0.94	0.003	1.19	200	2.80	2,022	5.00	6.74	27.31	16.39
G-3A	150.00	0.019	0.24	4.20	17.71	0.008	1.44	50	0.58	0.014	2.37	200	1.41	473	5.00	1.58	21.28	12.77
G-3B	150.00	0.028	0.24	4.20	15.07	0.041	3.26	300	1.53	0.041	4.11	200	0.81	507	5.00	1.69	19.10	11.46
G-4A	150.00	0.024	0.24	4.20	15.94	0.015	1.99	50	0.42	0.011	2.15	200	1.55	1,292	5.00	4.31	22.21	13.33
G-4B	150.00	0.001	0.13	4.20	31.47	0.005	1.14	300	4.38	0.005	1.44	100	1.16	1,608	5.00	5.36	42.37	25.42
G-4C	150.00	0.014	0.24	4.20	19.80	0.045	3.41	30	0.15	0.045	4.29	0	0.00	651	5.00	2.17	22.12	13.27
G-5A	150.00	0.0190	0.24	4.20	17.59	0.021	2.34	100	0.71	0.017	2.67	100	0.62	694	5.00	2.18	21.11	12.66
G-5B	150.00	0.021	0.24	4.20	16.86	0.016	2.05	50	0.41					1,992	5.00	6.64	23.91	14.34
G-5C	150.00	0.005	0.13	4.20	18.37	0.005	1.14	500	7.30	0.040	4.07	100	0.41	2,985	5.00	9.95	36.03	21.62
H	300.00	0.017	0.13	4.20	19.74	0.019	2.21	1,700	12.81					33,967	6.00	94.35	126.90	76.14
I	300.00	0.027	0.13	4.20	16.36	0.015	2.00	2,091	17.46					26,441	5.00	88.14	121.96	73.18
J	150.00	0.007	0.20	4.20	23.06	0.012	1.75	0	0.00					4,328	5.00	14.43	37.49	22.49
K	150.00	0.023	0.13	4.20	10.00	0.015	1.96	1,000	8.50					7,224	5.00	24.08	42.58	25.55
K-1	300.00	0.015	0.13	4.20	20.84	0.014	1.88	500	4.42					577	5.00	1.92	27.19	16.31
K-2	150.00	0.010	0.24	4.20	23.15	0.011	1.72	50	0.48	0.014	2.43	200	1.37	1,952	5.00	6.51	31.51	18.90
K-3	150.00	0.010	0.24	4.20	22.73	0.016	2.06	300	2.43					158	5.00	0.53	25.69	15.41
K-4	300.00	0.025	0.13	4.20	16.81	0.012	1.74	1,000	9.57					2,020	5.00	6.73	33.12	19.87
K-5	150.00	0.020	0.24	4.20	17.08	0.018	2.17	300	2.30	0.018	2.71	100	0.61	1,495	5.00	4.98	24.99	14.99
L	150.00	0.010	0.13	4.20	13.92	0.023	2.45	174	1.19					6,876	5.00	22.92	38.03	22.82



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ATTACHMENT "B" - DEVELOPED CONDITION DRAINAGE MAP
for
BERRY CREEK
Georgetown
Williamson County, Texas

Project No: 22226-M

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

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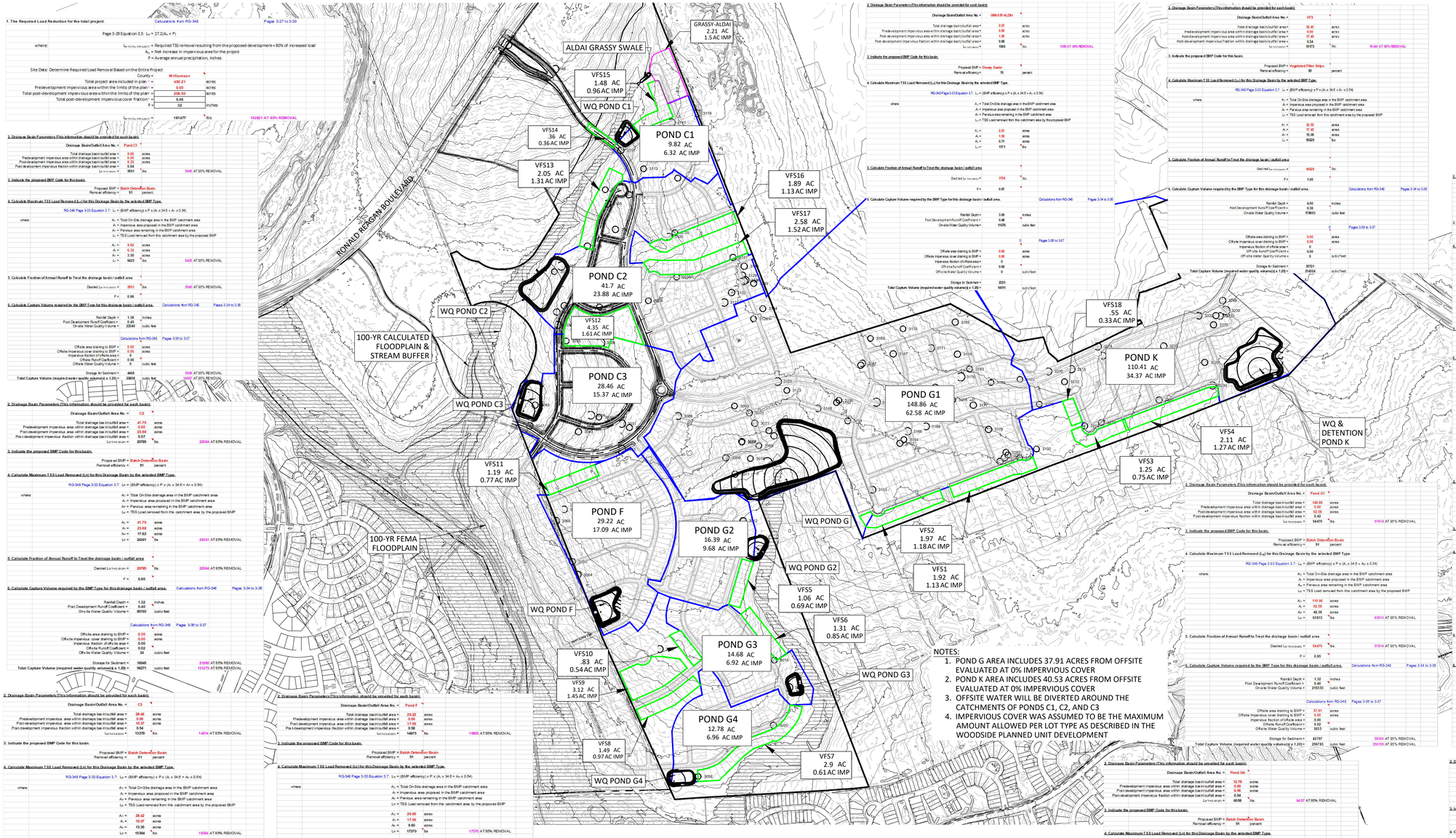
DEVELOPED DRAINAGE PLAN
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 07 of 93

2023-19-CON



NOTES:
1. POND G AREA INCLUDES 37.91 ACRES FROM OFFSITE EVALUATED AT 0% IMPERVIOUS COVER
2. POND K AREA INCLUDES 40.53 ACRES FROM OFFSITE EVALUATED AT 0% IMPERVIOUS COVER
3. OFFSITE WATER WILL BE DIVERTED AROUND THE CATCHMENTS OF PONDS C1, C2, AND C3
4. IMPERVIOUS COVER WAS ASSUMED TO BE THE MAXIMUM AMOUNT ALLOWED PER LOT TYPE AS DESCRIBED IN THE WOODSIDE PLANNED UNIT DEVELOPMENT

SUN CITY WOODSIDE WATER QUALITY LOAD REMOVAL & VOLUME SUMMARY TABLE

	VFS	ALDAI GRASSY SWALE	POND C1	POND C2	POND C3	POND G1	POND G2	POND G3	POND G4	POND F	POND K	SITE	% REMOVAL
REQ'D LOAD REMOVAL (LB) @ 80%			5501	20785	13378	54470	8425	6023	6058	14875	29916	181478	80.0%
REQ'D LOAD REMOVAL (LB) @ 85%	16140	1389	5845	22084	14214	57874	8952	6400	6437	15805	31785	192821	85.0%
MAX. BMP LOAD REMOVAL (LB)	16140	1171	6423	24386	15394	63813	9859	7094	7104	17370	35109	192821	91.0%
REQ'D WQV (CF) @ 80%			26808	96929	66811	256783	38980	28887	28174	72522	144919	760813	80.0%
REQ'D WQV (CF) @ 85%			34967	132176	92793	350159	59100	37203	38418	94594	197617	1037027	85.0%
WQV (CF) NEEDED @ 91%			77705	293725	185586	778130	131332	87535	85374	210210	439148	2288745	91.0%
PROVIDED WQV (CF)			59147	256271	184310	359900	67661	53845	65489	160003	390050	1596676	YES
EXCESS WQV	0	0	24180	124095	91517	9741	8561	16642	27071	65409	192433	559649	YES

WARNING!
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BEM	8-22-2022
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
08/24/2023

STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

WATER QUALITY PLAN
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 08 of 93

2023-19-CON

STRM-OFF HYDROLOGIC AND INLET CALCS

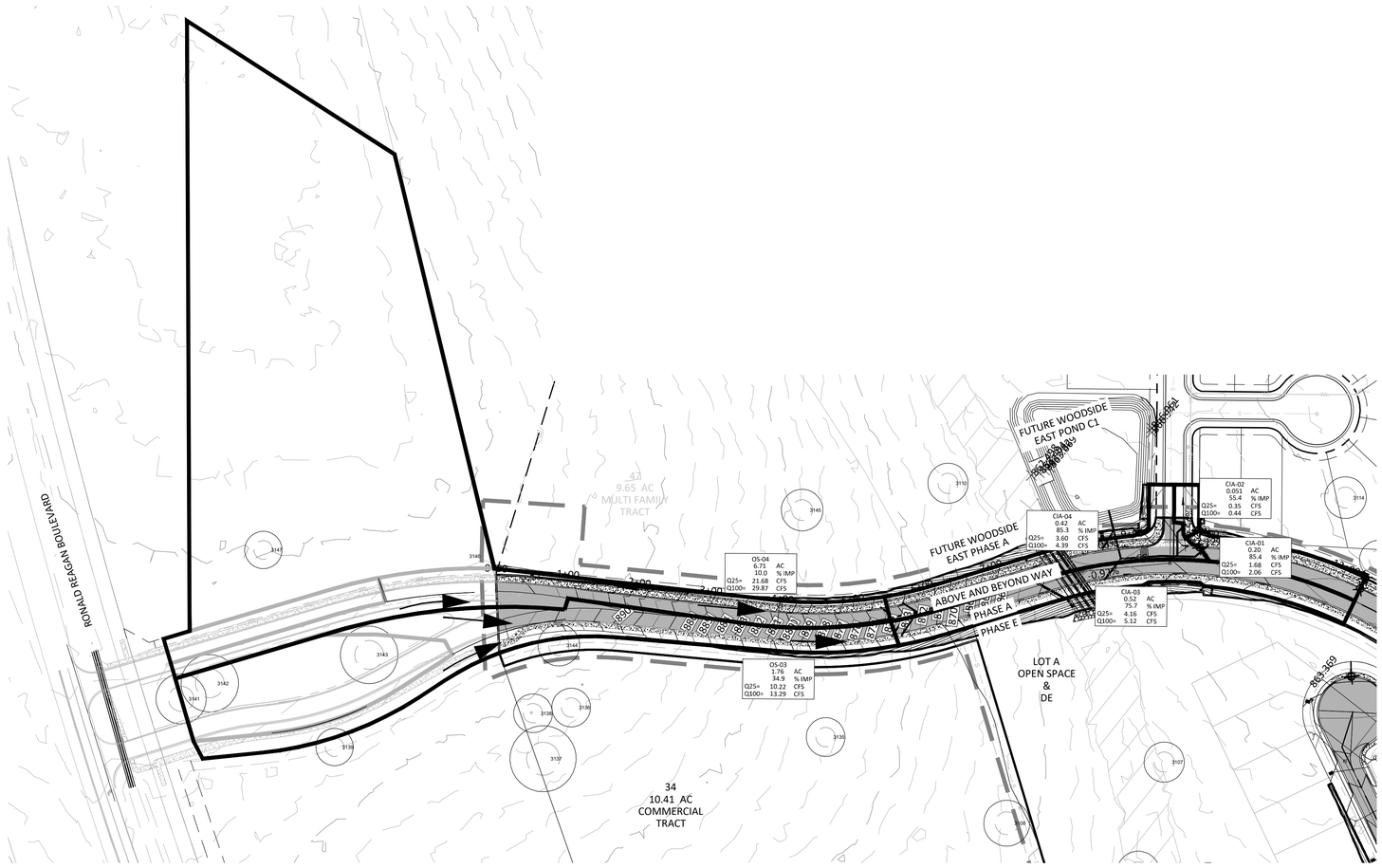
Subarea Number	Area (acres)	Tc (min)	i2 (in/hr)	i10 (in/hr)	i25 (in/hr)	i100 (in/hr)	C2	C10	C25	C100	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)	Building/Drives (ac)	%	Roadway/Sidewalks (ac)	%	Grass (ac)	%
OS-03	1.76	27.89	3.38	4.80	5.66	6.99	0.54	0.57	0.59	0.64	3.20	4.82	5.88	7.83	0.01	0.00	0.61	0.35	1.14	0.65
OS-04	6.71	14.81	4.62	6.36	7.39	9.04	0.37	0.42	0.45	0.51	11.60	17.88	22.13	30.91	0.00	0.00	0.64	0.10	6.04	0.90

Inlet Number	Drainage Area No.	Qfrom passing + Q100	Street Longitudinal Slope	Street Cross Slope	Ponded Width (T)	Gutter Flow Depth (y)	Manning's n	Depression Depth (a)	Depression Width (W)	Area Depressed Section (Aw)	Wetted Perimeter Depressed Section (Pw)	Conveyance Depressed Section (Kw)	Area Gutter Section (Ao)	Wetted Perimeter Gutter Section (Po)	Conveyance Gutter Section (Ko)	Depression Flow Ratio (Eo)	Equivalent Cross Slope at Inlet Opening (Se)	Inlet Length Design	Inlet Length Required	Bypass Flow	Qinlet	Comment
		cfs	ft/ft	ft/ft	ft	ft	-	ft	ft	ft^2	ft	cfs	ft^2	ft	cfs	-	ft/ft	ft	ft	cfs	cfs	
OS-03	OS-03	7.83	0.05	0.02	10.64	0.21	0.013	0.8125	1.5	0.91	1.72	67.56	0.84	9.14	19.39	0.78	0.44	10	12.83	0.52	7.31	C.I. On Grade
OS-04	OS-04	30.91	0.05	0.02	17.81	0.36	0.013	0.8125	1.5	1.12	1.72	96.34	2.66	16.31	90.80	0.51	0.30	10	28.84	14.36	16.54	C.I. On Grade

STRM-C1A HYDROLOGIC AND INLET CALCS

Subarea Number	Area (acres)	Tc (min)	i2 (in/hr)	i10 (in/hr)	i25 (in/hr)	i100 (in/hr)	C2	C10	C25	C100	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)	Building/Drives (ac)	%	Roadway/Sidewalks (ac)	%	Grass (ac)	%
C1A-01	0.20	27.89	3.38	4.80	5.66	6.99	0.87	0.88	0.89	0.90	0.58	0.83	0.98	1.22	0.10	0.49	0.07	0.37	0.03	0.15
C1A-02	0.05	27.96	3.37	4.79	5.65	6.98	0.68	0.70	0.71	0.74	0.12	0.17	0.20	0.26	0.02	0.31	0.01	0.24	0.02	0.45
C1A-03	0.52	28.03	3.37	4.78	5.64	6.98	0.81	0.82	0.83	0.85	1.41	2.03	2.41	3.05	0.27	0.53	0.12	0.23	0.13	0.24
C1A-04	0.42	14.81	4.62	6.36	7.39	9.04	0.77	0.78	0.79	0.81	1.48	2.08	2.45	3.07	0.00	0.00	0.14	0.69	0.06	0.31

Inlet Number	Drainage Area No.	Qfrom passing + Q100	Street Longitudinal Slope	Street Cross Slope	Ponded Width (T)	Gutter Flow Depth (y)	Manning's n	Depression Depth (a)	Depression Width (W)	Area Depressed Section (Aw)	Wetted Perimeter Depressed Section (Pw)	Conveyance Depressed Section (Kw)	Area Gutter Section (Ao)	Wetted Perimeter Gutter Section (Po)	Conveyance Gutter Section (Ko)	Depression Flow Ratio (Eo)	Equivalent Cross Slope at Inlet Opening (Se)	Inlet Length Design	Inlet Length Required	Bypass Flow	Qinlet	Comment
		cfs	ft/ft	ft/ft	ft	ft	-	ft	ft	ft^2	ft	cfs	ft^2	ft	cfs	-	ft/ft	ft	ft	cfs	cfs	
C1A-01	C1A-01	1.22	0.02	0.02	6.30	0.13	0.013	0.8125	1.5	0.78	1.72	52.16	0.23	4.80	3.48	0.94	0.53	10	4.01	0.00	1.22	C.I. On Grade
C1A-02	C1A-02	0.26	0.025	0.02	3.39	0.07	0.013	0.8125	2.5	1.12	2.64	72.50	0.01	0.89	0.04	1.00	0.34	11	2.90	0.00	0.26	C.I. On Grade
C1A-03	C1A-03	3.05	0.01	0.02	10.10	0.20	0.013	0.8125	3.5	2.01	3.61	155.06	0.44	6.60	8.14	0.95	0.24	12	7.66	0.00	3.05	C.I. On Grade
C1A-04	C1A-04	3.07	0.01	0.02	10.14	0.20	0.013	0.8125	1.5	0.89	1.72	65.68	0.75	8.64	16.67	0.80	0.45	10	5.27	0.00	3.07	C.I. On Grade



LEGEND

- TIME OF CONCENTRATION PATH
- SUBBASIN BOUNDARY
- FLOW DIRECTION
- STORM MANHOLE
- STORM JUNCTION BOX
- WASTEWATER MANHOLE
- CURB INLET
- EXISTING CONTOURS(MAJOR)
- EXISTING CONTOURS(MINOR)
- PROPOSED CONTOURS(MAJOR)
- PROPOSED CONTOURS(MINOR)
- PHASE LINE
- BOUNDARY LINE

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

NO.	REVISION	BY	DATE

SJT — DESIGNED BY: — 8-10-2022 DATE
BLM, SJT — DRAWN BY: — 8-16-2022 DATE
SJT — CHECKED BY: — 8-19-2022 DATE
BEM — APPROVED BY: — 8-22-2022 DATE

STATE OF TEXAS — BRYAN ERIC MOORE — 98920 — LICENSED PROFESSIONAL ENGINEER — 08/24/2023

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Project No: 22226-21

SHEET 09 of 93

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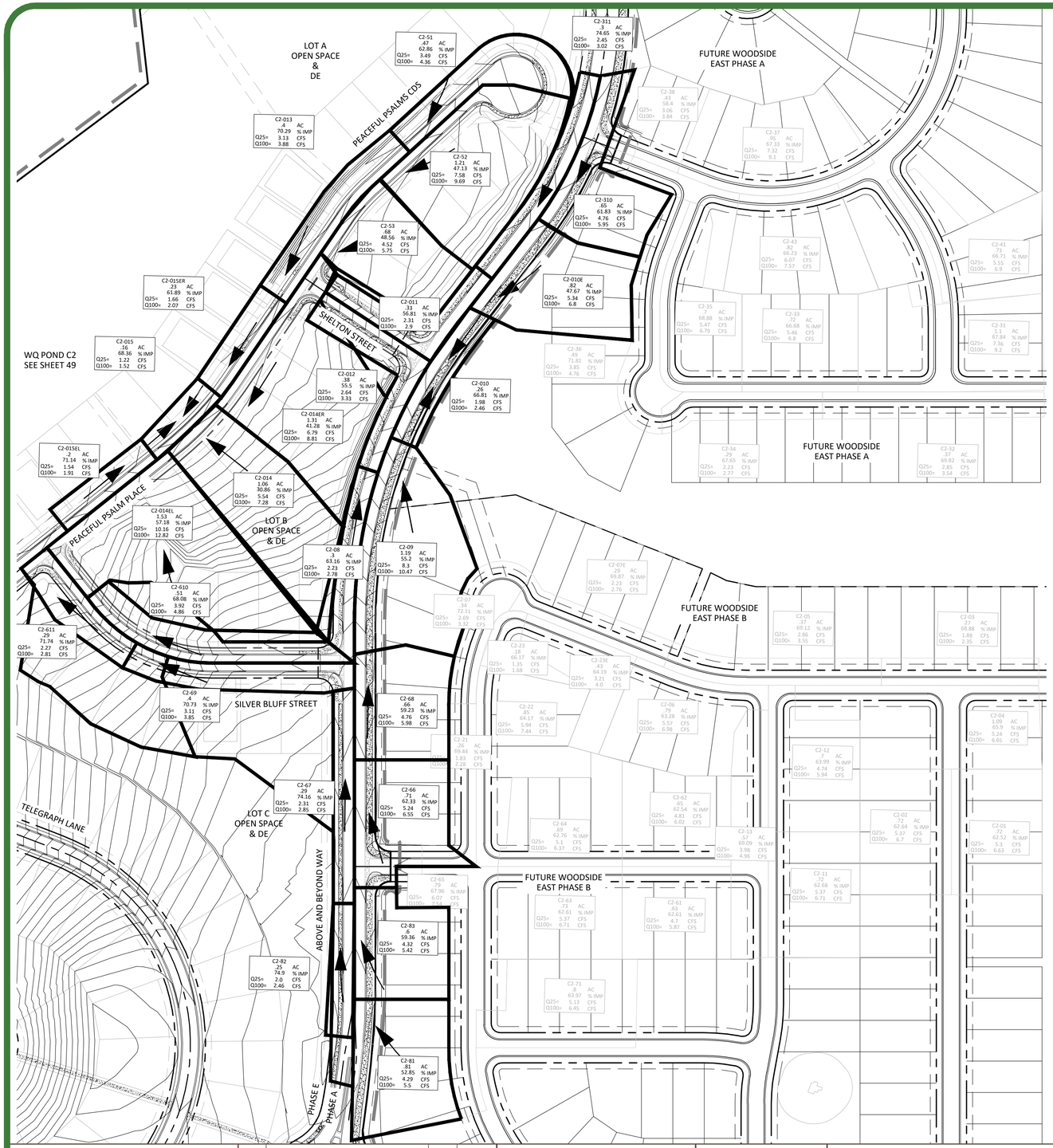
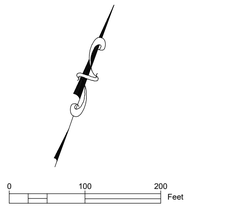


LineNo.	InletID	FlowRate	GutterSlope	CrossSlope, Sx	GutterSpread	GutterDepth	n-valueGutter	ThroatHt	GutterWidth	StructLength	QCarryover	QCaptured	QBypass	JunctType
88	C2-01 (FUTURE)	5.47	0.005	0.02	0	0.26	0.015	3.8	0.83	11	0	0	0	Curb
30	C2-010	1.98 Sag		0.02	0	0	....	3.8	0.83	11	0	0	0	Curb
33	C2-010E	5.34	0.012	0.02	0	0.22	0.015	3.8	0.83	11	0	0	0	Curb
26	C2-011	2.31	0.022	0.02	0	0.14	0.015	3.8	0.83	11	0	0	0	Curb
24	C2-012	2.64	0.019	0.02	0	0.16	0.015	3.8	0.83	11	0	0	0	Curb
20	C2-013	3.98	0.009	0.02	0	0.21	0.015	3.8	0.83	11	0	0	0	Curb
12	C2-014	5.54 Sag		0.02	0	0	....	3.8	0.83	11	0	0	0	Curb
8	C2-014EL	10.16	0.017	0.02	0	0.26	0.015	3.8	0.83	11	0	0	0	Curb
15	C2-014ER	6.79	0.009	0.02	0	0.25	0.015	3.8	0.83	11	0	0	0	Curb
10	C2-015	1.22 Sag		0.02	0	0	....	3.8	0.83	11	0	0	0	Curb
4	C2-015EL	1.54	0.022	0.02	0	0.12	0.015	3.8	0.83	11	0	0	0	Curb
17	C2-015ER	1.66	0.01	0.02	0	0.15	0.015	3.8	0.83	11	0	0	0	Curb
96	C2-02 (FUTURE)	5.37	0.005	0.02	0	0.26	0.015	3.8	0.83	11	0	0	0	Curb
93	C2-03 (FUTURE)	1.87	0.012	0.02	0	0.15	0.015	3.8	0.83	11	0	0	0	Curb
92	C2-04 (FUTURE)	5.29	0.012	0.02	0	0.22	0.015	3.8	0.83	11	0	0	0	Curb
87	C2-05 (FUTURE)	2.84	0.012	0.02	0	0.17	0.015	3.8	0.83	11	0	0	0	Curb
85	C2-06 (FUTURE)	5.57	0.012	0.02	0	0.22	0.015	3.8	0.83	11	0	0	0	Curb
79	C2-07 (FUTURE)	2.69 Sag		0.02	0	0	....	3.8	0.83	11	0	0	0	Curb
77	C2-07E (FUTURE	2.23	0.007	0.02	0	0.18	0.015	3.8	0.83	11	0	0	0	Curb
74	C2-08	2.23	0.018	0.02	0	0.15	0.015	3.8	0.83	11	0	0	0	Curb
72	C2-09	8.3	0.019	0.02	0	0.24	0.015	3.8	0.83	11	0	0	0	Curb
103	C2-11 (FUTURE)	5.37	0.007	0.02	0	0.24	0.015	3.8	0.83	11	0	0	0	Curb
102	C2-12 (FUTURE)	4.74	0.007	0.02	0	0.23	0.015	3.8	0.83	11	0	0	0	Curb
99	C2-13 (FUTURE)	3.98	0.014	0.02	0	0.19	0.015	3.8	0.83	11	0	0	0	Curb
109	C2-21 (FUTURE)	2.04	0.013	0.02	0	0.15	0.015	3.8	0.83	11	0	0	0	Curb
108	C2-22 (FUTURE)	5.94	0.014	0.02	0	0.25	0.015	3.8	0.83	11	0	0	0	Curb
105	C2-23 (FUTURE)	1.35 Sag		0.02	0	0	....	3.8	0.83	11	0	0	0	Curb
83	C2-23E (FUTURE	3.21	0.005	0.02	0	0.24	0.015	3.8	0.83	11	0	0	0	Curb
62	C2-31 (FUTURE)	7.36	0.012	0.02	0	0.28	0.015	3.8	0.83	11	0	0	0	Curb
38	**C2-310**	**4.76**	**0.012**	**0.02**	**0**	**0.24**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
35	**C2-311**	**2.45**	**0.012**	**0.02**	**0**	**0.18**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
61	C2-32 (FUTURE)	2.85	0.012	0.02	0	0.19	0.015	3.8	0.83	11	0	0	0	Curb
59	C2-33 (FUTURE)	5.46	0.012	0.02	0	0.25	0.015	3.8	0.83	11	0	0	0	Curb
56	C2-34 (FUTURE)	2.26	0.006	0.02	0	0.2	0.015	3.8	0.83	11	0	0	0	Curb
52	C2-35 (FUTURE)	5.47	0.01	0.02	0	0.26	0.015	3.8	0.83	11	0	0	0	Curb
50	C2-36 (FUTURE)	3.85	0.01	0.02	0	0.22	0.015	3.8	0.83	11	0	0	0	Curb
46	C2-37 (FUTURE)	6.6	0.017	0.02	0	0.25	0.015	3.8	0.83	11	0	0	0	Curb
44	C2-38 (FUTURE)	2.31	0.032	0.02	0	0.15	0.015	3.8	0.83	11	0	0	0	Curb
42	**C2-39**	**3.06 Sag**		**0.02**	**0**	**0**	....	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
70	C2-41 (FUTURE)	5.55	0.017	0.02	0	0.2	0.015	3.8	0.83	11	0	0	0	Curb
66	**C2-42**	**3.7**	**0.011**	**0.02**	**0**	**0.22**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
63	C2-43 (FUTURE)	6.07	0.016	0.02	0	0.24	0.015	3.8	0.83	11	0	0	0	Curb
115	**C2-51**	**3.49**	**0.009**	**0.02**	**0**	**0.22**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
114	**C2-52**	**7.58**	**0.009**	**0.02**	**0**	**0.3**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
111	**C2-53**	**4.52**	**0.009**	**0.02**	**0**	**0.24**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
144	C2-61 (FUTURE)	4.7	0.005	0.02	0	0.28	0.015	3.8	0.83	11	0	0	0	Curb
119	**C2-610**	**3.92**	**0.032**	**0.02**	**0**	**0.18**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
151	**C2-611**	**2.27**	**0.012**	**0.02**	**0**	**0.18**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
142	C2-62 (FUTURE)	4.81	0.005	0.02	0	0.28	0.015	3.8	0.83	11	0	0	0	Curb
141	C2-63 (FUTURE)	5.37	0.005	0.02	0	0.29	0.015	3.8	0.83	11	0	0	0	Curb
139	C2-64 (FUTURE)	5.1	0.005	0.02	0	0.28	0.015	3.8	0.83	11	0	0	0	Curb
135	C2-65 (FUTURE)	5.76	0.013	0.02	0	0.22	0.015	3.8	0.83	11	0	0	0	Curb
131	**C2-66**	**5.24**	**0.018**	**0.02**	**0**	**0.23**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
129	**C2-67**	**2.31**	**0.018**	**0.02**	**0**	**0.17**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
127	**C2-68**	**4.76 Sag**		**0.02**	**0**	**0**	....	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
123	**C2-69**	**3.11**	**0.03**	**0.02**	**0**	**0.17**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
145	C2-71 (FUTURE)	5.13	0.006	0.02	0	0.28	0.015	3.8	0.83	11	0	0	0	Curb
150	**C2-81**	**3.54**	**0.012**	**0.02**	**0**	**0.21**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
149	**C2-82**	**2.02**	**0.036**	**0.02**	**0**	**0.14**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
147	**C2-83**	**4.32**	**0.018**	**0.02**	**0**	**0.21**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**

STRM C-2 25-YR FLOW TO INLETS

LineNo.	InletID	FlowRate	GutterSlope	CrossSlope, Sx	GutterSpread	GutterDepth	n-valueGutter	ThroatHt	GutterWidth	StructLength	QCarryover	QCaptured	QBypass	JunctType
88	C2-01 (FUTURE)	6.63	0.005	0.02	0	0.31	0.015	3.8	0.83	11	0	0	0	Curb
30	C2-010	2.46 Sag		0.02	0	0	....	3.8	0.83	11	0	0	0	Curb
33	C2-010E	6.8	0.012	0.02	0	0.27	0.015	3.8	0.83	11	0	0	0	Curb
26	C2-011	6.71	0.022	0.02	0	0.24	0.015	3.8	0.83	11	0	0	0	Curb
24	C2-012	3.33	0.019	0.02	0	0.19	0.015	3.8	0.83	11	0	0	0	Curb
20	C2-013	3.88	0.009	0.02	0	0.23	0.015	3.8	0.83	11	0	0	0	Curb
12	C2-014	7.28 Sag		0.02	0	0	....	3.8	0.83	11	0	0	0	Curb
8	C2-014EL	12.82	0.017	0.02	0	0.32	0.015	3.8	0.83	11	0	0	0	Curb
15	C2-014ER	8.81	0.009	0.02	0	0.31	0.015	3.8	0.83	11	0	0	0	Curb
10	C2-015	1.52 Sag		0.02	0	0	....	3.8	0.83	11	0	0	0	Curb
4	C2-015EL	1.91	0.022	0.02	0	0.15	0.015	3.8	0.83	11	0	0	0	Curb
17	C2-015ER	2.07	0.01	0.02	0	0.18	0.015	3.8	0.83	11	0	0	0	Curb
96	C2-02 (FUTURE)	6.7	0.005	0.02	0	0.32	0.015	3.8	0.83	11	0	0	0	Curb
93	C2-03 (FUTURE)	2.34	0.012	0.02	0	0.18	0.015	3.8	0.83	11	0	0	0	Curb
92	C2-04 (FUTURE)	6.71	0.012	0.02	0	0.27	0.015	3.8	0.83	11	0	0	0	Curb
87	C2-05 (FUTURE)	3.53	0.012	0.02	0	0.21	0.015	3.8	0.83	11	0	0	0	Curb
85	C2-06 (FUTURE)	6.98	0.012	0.02	0	0.27	0.015	3.8	0.83	11	0	0	0	Curb
79	C2-07 (FUTURE)	3.32 Sag		0.02	0	0	....	3.8	0.83	11	0	0	0	Curb
77	C2-07E (FUTURE	2.76	0.007	0.02	0	0.21	0.015	3.8	0.83	11	0	0	0	Curb
74	C2-08	2.78	0.018	0.02	0	0.18	0.015	3.8	0.83	11	0	0	0	Curb
72	C2-09	10.47	0.019	0.02	0	0.29	0.015	3.8	0.83	11	0	0	0	Curb
103	C2-11 (FUTURE)	6.71	0.007	0.02	0	0.3	0.015	3.8	0.83	11	0	0	0	Curb
102	C2-12 (FUTURE)	5.94	0.007	0.02	0	0.28	0.015	3.8	0.83	11	0	0	0	Curb
99	C2-13 (FUTURE)	4.96	0.014	0.02	0	0.23	0.015	3.8	0.83	11	0	0	0	Curb
109	C2-21 (FUTURE)	2.52	0.013	0.02	0	0.18	0.015	3.8	0.83	11	0	0	0	Curb
108	C2-22 (FUTURE)	7.44	0.014	0.02	0	0.27	0.015	3.8	0.83	11	0	0	0	Curb
105	C2-23 (FUTURE)	4 Sag		0.02	0	0	....	3.8	0.83	11	0	0	0	Curb
83	C2-23E (FUTURE	1.68	0.005	0.02	0	0.19	0.015	3.8	0.83	11	0	0	0	Curb
62	C2-31 (FUTURE)	9.2	0.012	0.02	0	0.3	0.015	3.8	0.83	11	0	0	0	Curb
38	**C2-310**	**5.95**	**0.012**	**0.02**	**0**	**0.26**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
35	**C2-311**	**3.02**	**0.012**	**0.02**	**0**	**0.2**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
61	C2-32 (FUTURE)	3.53	0.012	0.02	0	0.21	0.015	3.8	0.83	11	0	0	0	Curb
59	C2-33 (FUTURE)	6.8	0.012	0.02	0	0.27	0.015	3.8	0.83	11	0	0	0	Curb
56	C2-34 (FUTURE)	2.8	0.006	0.02	0	0.22	0.015	3.8	0.83	11	0	0	0	Curb
52	C2-35 (FUTURE)	6.79	0.01	0.02	0	0.28	0.015	3.8	0.83	11	0	0	0	Curb
50	C2-36 (FUTURE)	4.76	0.01	0.02	0	0.24	0.015	3.8	0.83	11	0	0	0	Curb
46	C2-37 (FUTURE)	8.24	0.017	0.02	0	0.27	0.015	3.8	0.83	11	0	0	0	Curb
44	C2-38 (FUTURE)	2.88	0.032	0.02	0	0.24	0.015	3.8	0.83	11	0	0	0	Curb
42	**C2-39**	**3.84 Sag**		**0.02**	**0**	**0**	....	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
70	C2-41 (FUTURE)	6.9	0.037	0.02	0	0.22	0.015	3.8	0.83	11	0	0	0	Curb
66	**C2-42**	**4.59**	**0.011**	**0.02**	**0**	**0.24**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
63	C2-43 (FUTURE)	7.57	0.016	0.02	0	0.27	0.015	3.8	0.83	11	0	0	0	Curb
115	**C2-51**	**4.36**	**0.009**	**0.02**	**0**	**0.24**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
114	**C2-52**	**9.69**	**0.009**	**0.02**	**0**	**0.32**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
111	**C2-53**	**5.75**	**0.009**	**0.02**	**0**	**0.27**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
144	C2-61 (FUTURE)	5.87	0.005	0.02	0	0.3	0.015	3.8	0.83	11	0	0	0	Curb
119	**C2-610**	**4.86**	**0.032**	**0.02**	**0**	**0.2**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
151	**C2-611**	**2.81**	**0.012**	**0.02**	**0**	**0.19**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
142	C2-62 (FUTURE)	6.02	0.005	0.02	0	0.3	0.015	3.8	0.83	11	0	0	0	Curb
141	C2-63 (FUTURE)	6.71	0.005	0.02	0	0.32	0.015	3.8	0.83	11	0	0	0	Curb
139	C2-64 (FUTURE)	6.37	0.005	0.02	0	0.31	0.015	3.8	0.83	11	0	0	0	Curb
135	C2-65 (FUTURE)	7.17	0.023	0.02	0	0.24	0.015	3.8	0.83	11	0	0	0	Curb
131	**C2-66**	**6.55**	**0.018**	**0.02**	**0**	**0.25**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
129	**C2-67**	**2.85**	**0.018**	**0.02**	**0**	**0.18**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
127	**C2-68**	**5.98 Sag**		**0.02**	**0**	**0**	....	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
123	**C2-69**	**3.85**	**0.03**	**0.02**	**0**	**0.18**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
145	C2-71 (FUTURE)	6.45	0.006	0.02	0	0.3	0.015	3.8	0.83	11	0	0	0	Curb
150	**C2-81**	**4.5**	**0.012**	**0.02**	**0**	**0.23**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
149	**C2-82**	**2.52**	**0.036**	**0.02**	**0**	**0.15**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**
147	**C2-83**	**5.42**	**0.018**	**0.02**	**0**	**0.23**	**0.015**	**3.8**	**0.83**	**11**	**0**	**0**	**0**	**Curb**

STRM C-2 100-YR FLOW TO INLETS



LEGEND

- TIME OF CONCENTRATION PATH
- SUBBASIN BOUNDARY
- FLOW DIRECTION
- STORM MANHOLE
- STORM JUNCTION BOX
- WASTEWATER MANHOLE
- CURB INLET
- EXISTING CONTOURS(MAJOR)
- EXISTING CONTOURS(MINOR)
- PROPOSED CONTOURS(MAJOR)
- PROPOSED CONTOURS(MINOR)
- PHASE LINE
- BOUNDARY LINE

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

NO.	REVISION	BY	DATE

SJT — DESIGNED BY: — 8-10-2022 DATE
BLM, SJT — DRAWN BY: — 8-16-2022 DATE
SJT — CHECKED BY: — 8-19-2022 DATE
BEM — APPROVED BY: — 8-22-2022 DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
08/24/2023

STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

STRM-C2 INLET CALCULATIONS (1 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 10 of 93

2023-19-CON

HYDROLOGIC SUMMARY TABLE

Subarea	Area	Tc	i2	i10	i25	i100	C2	C10	C25	C100	Q2	Q10	Q25	Q100	Building/Drives	%	Roadway/Sidewalks	%	Grass	%
C2-	1.06	8.15	5.73	7.73	8.87	10.77	0.72	0.74	0.75	0.78	4.38	6.06	7.06	8.87	0.488	0.46	0.171	0.01	0.4	0.38
C2-01	0.72	5	6.48	8.64	9.84	11.88	0.72	0.74	0.75	0.78	3.35	4.59	5.3	6.63	0.358	0.5	0.09	0.13	0.27	0.38
C2-010	0.26	5	6.48	8.64	9.84	11.88	0.75	0.77	0.78	0.8	1.26	1.72	1.98	2.46	0	0	0.173	0.41	0.09	0.35
C2-010E	0.82	5.17	6.43	8.59	9.78	11.81	0.62	0.65	0.67	0.7	3.29	4.58	5.34	6.8	0.263	0.32	0.128	0.35	0.43	0.53
C2-011	0.33	5	6.48	8.64	9.84	11.88	0.68	0.71	0.72	0.75	1.45	1.99	2.31	2.9	0.004	0.01	0.181	0.45	0.14	0.43
C2-012	0.38	5	6.48	8.64	9.84	11.88	0.68	0.7	0.71	0.74	1.65	2.28	2.64	3.33	0	0	0.209	0.49	0.17	0.45
C2-013	0.4	5	6.48	8.64	9.84	11.88	0.77	0.79	0.8	0.82	2	2.72	3.13	3.88	0.138	0.35	0.143	0.11	0.12	0.3
C2-014	1.06	7.1	5.96	8.01	9.17	11.11	0.51	0.55	0.57	0.62	3.25	4.66	5.54	7.28	0.274	0.26	0.054	0.21	0.73	0.69
C2-014EL	1.53	7.06	5.97	8.02	9.18	11.12	0.69	0.71	0.72	0.75	6.29	8.72	10.16	12.82	0.725	0.47	0.152	0.53	0.66	0.43
C2-014ER	1.31	10.8	5.23	7.11	8.21	10	0.58	0.61	0.63	0.67	4	5.72	6.79	8.81	0.385	0.29	0.157	0.55	0.77	0.59
C2-015	0.16	5	6.48	8.64	9.84	11.88	0.76	0.78	0.79	0.81	0.78	1.06	1.22	1.52	0.052	0.33	0.055	0.25	0.05	0.32
C2-015EL	0.2	5	6.48	8.64	9.84	11.88	0.78	0.79	0.8	0.82	0.98	1.34	1.54	1.91	0.056	0.29	0.083	0.34	0.06	0.31
C2-015ER	0.23	5	6.48	8.64	9.84	11.88	0.72	0.74	0.75	0.78	1.05	1.43	1.66	2.07	0.057	0.25	0.082	0.29	0.09	0.4
C2-02	0.72	5	6.48	8.64	9.84	11.88	0.72	0.74	0.75	0.78	3.39	4.64	5.37	6.7	0.363	0.5	0.091	0.11	0.27	0.37
C2-03	0.27	8.15	5.73	7.73	8.87	10.77	0.76	0.78	0.79	0.81	1.18	1.62	1.88	2.35	0.072	0.27	0.114	0.14	0.08	0.3
C2-04	1.09	22.7	3.78	5.3	6.23	7.67	0.74	0.76	0.77	0.8	3.07	4.4	5.24	6.65	0.437	0.4	0.281	0.5	0.37	0.34
C2-05	0.37	5	6.48	8.64	9.84	11.88	0.77	0.78	0.79	0.81	1.83	2.49	2.86	3.55	0.097	0.26	0.158	0.23	0.11	0.3
C2-06	0.79	6.76	6.04	8.1	9.27	11.23	0.73	0.75	0.76	0.78	3.49	4.8	5.57	6.98	0.391	0.49	0.111	0.16	0.29	0.37
C2-07	0.34	5	6.48	8.64	9.84	11.88	0.79	0.8	0.81	0.83	1.72	2.34	2.69	3.32	0.087	0.26	0.157	0.14	0.09	0.27
C2-07E	0.28	5	6.48	8.64	9.84	11.88	0.77	0.79	0.8	0.82	1.42	1.94	2.23	2.76	0.073	0.26	0.126	0.25	0.09	0.32
C2-08	0.3	5	6.48	8.64	9.84	11.88	0.73	0.75	0.76	0.78	1.41	1.93	2.23	2.78	0	0	0.189	0.56	0.11	0.37
C2-09	1.19	5	6.48	8.64	9.84	11.88	0.67	0.7	0.71	0.74	5.19	7.15	8.3	10.47	0.409	0.34	0.247	0.37	0.53	0.45
C2-11	0.72	5	6.48	8.64	9.84	11.88	0.72	0.74	0.75	0.78	3.39	4.64	5.37	6.71	0.362	0.5	0.091	0.19	0.27	0.37
C2-12	0.7	8.15	5.73	7.73	8.87	10.77	0.73	0.75	0.76	0.79	2.95	4.07	4.74	5.94	0.33	0.47	0.119	0.25	0.25	0.36
C2-13	0.57	8.15	5.73	7.73	8.87	10.77	0.77	0.78	0.79	0.81	2.49	3.42	3.98	4.96	0.173	0.31	0.219	0.22	0.18	0.32
C2-21	0.26	8.15	5.73	7.73	8.87	10.77	0.77	0.78	0.79	0.81	1.15	1.57	1.83	2.28	0.065	0.25	0.116	0.43	0.08	0.31
C2-22	0.85	7.08	5.97	8.01	9.17	11.12	0.73	0.75	0.76	0.79	3.72	5.12	5.94	7.44	0.391	0.46	0.154	0.01	0.3	0.35
C2-23	0.18	5	6.48	8.64	9.84	11.88	0.75	0.76	0.77	0.8	0.86	1.17	1.35	1.68	0.066	0.37	0.051	0.17	0.06	0.34
C2-23E	0.43	5	6.48	8.64	9.84	11.88	0.73	0.75	0.76	0.79	2.03	2.78	3.21	4	0.19	0.44	0.085	0.11	0.15	0.35
C2-31	1.1	9.55	5.46	7.39	8.51	10.34	0.76	0.77	0.78	0.81	4.56	6.31	7.36	9.2	0.509	0.46	0.24	0.3	0.35	0.32
C2-310	0.65	5	6.48	8.64	9.84	11.88	0.72	0.74	0.75	0.78	3.01	4.12	4.76	5.95	0.197	0.3	0.203	0.28	0.25	0.39
C2-311	0.3	5	6.48	8.64	9.84	11.88	0.8	0.82	0.82	0.84	1.57	2.13	2.45	3.02	0	0	0.226	0.6	0.08	0.26
C2-32	0.37	5	6.48	8.64	9.84	11.88	0.77	0.79	0.79	0.82	1.82	2.48	2.85	3.54	0.1	0.27	0.154	0.14	0.11	0.3
C2-33	0.72	5	6.48	8.64	9.84	11.88	0.75	0.77	0.78	0.8	3.47	4.74	5.46	6.8	0.393	0.55	0.084	0.23	0.24	0.34
C2-34	0.29	5	6.48	8.64	9.84	11.88	0.76	0.77	0.78	0.8	1.42	1.94	2.23	2.77	0.076	0.26	0.12	0.17	0.09	0.31
C2-35	0.7	5	6.48	8.64	9.84	11.88	0.76	0.78	0.79	0.81	3.49	4.75	5.47	6.79	0.3	0.43	0.185	0.26	0.22	0.31
C2-36	0.49	5	6.48	8.64	9.84	11.88	0.78	0.8	0.81	0.83	2.46	3.34	3.85	4.76	0.13	0.27	0.218	0.84	0.14	0.29
C2-37	0.95	5	6.48	8.64	9.84	11.88	0.75	0.77	0.78	0.8	4.66	6.35	7.32	9.1	0.496	0.52	0.146	0.37	0.31	0.33
C2-38	0.43	5	6.48	8.64	9.84	11.88	0.7	0.72	0.73	0.76	1.92	2.64	3.06	3.84	0.196	0.46	0.054	0.04	0.18	0.42
C2-41	0.73	5	6.48	8.64	9.84	11.88	0.75	0.77	0.78	0.8	3.53	4.81	5.55	6.9	0.385	0.53	0.099	0.12	0.24	0.33
C2-43	0.82	5.78	6.28	8.39	9.58	11.58	0.75	0.76	0.77	0.8	3.84	5.25	6.07	7.57	0.469	0.57	0.074	0.24	0.28	0.34
C2-51	0.47	5	6.48	8.64	9.84	11.88	0.72	0.74	0.75	0.78	2.21	3.02	3.49	4.36	0.108	0.23	0.188	0.26	0.17	0.36
C2-52	1.21	6.29	6.15	8.24	9.41	11.39	0.62	0.65	0.66	0.7	4.64	6.48	7.58	9.69	0.376	0.31	0.196	0.25	0.64	0.53
C2-53	0.68	5	6.48	8.64	9.84	11.88	0.63	0.66	0.67	0.71	2.79	3.88	4.52	5.75	0.266	0.39	0.066	0.11	0.35	0.51
C2-61	0.63	5	6.48	8.64	9.84	11.88	0.72	0.74	0.75	0.78	2.97	4.06	4.7	5.87	0.319	0.5	0.079	0	0.24	0.38
C2-610	0.51	5	6.48	8.64	9.84	11.88	0.76	0.78	0.78	0.81	2.49	3.4	3.92	4.86	0.145	0.29	0.201	0.28	0.16	0.32
C2-611	0.29	5	6.48	8.64	9.84	11.88	0.78	0.8	0.81	0.83	1.45	1.97	2.27	2.81	0.09	0.32	0.115	0.1	0.08	0.28
C2-62	0.65	5	6.48	8.64	9.84	11.88	0.72	0.74	0.75	0.78	3.04	4.17	4.81	6.02	0.328	0.5	0.079	0.12	0.24	0.37
C2-63	0.73	5	6.48	8.64	9.84	11.88	0.72	0.74	0.75	0.78	3.4	4.65	5.37	6.71	0.364	0.5	0.09	0.11	0.27	0.37
C2-64	0.69	5	6.48	8.64	9.84	11.88	0.72	0.74	0.75	0.78	3.22	4.41	5.1	6.37	0.342	0.5	0.089	0.14	0.26	0.38
C2-65	0.79	5	6.48	8.64	9.84	11.88	0.76	0.77	0.78	0.81	3.87	5.27	6.07	7.54	0.193	0.25	0.341	1.14	0.25	0.32
C2-66	0.71	5	6.48	8.64	9.84	11.88	0.72	0.74	0.75	0.78	3.31	4.54	5.24	6.55	0.205	0.29	0.237	0.25	0.27	0.38
C2-67	0.29	5	6.48	8.64	9.84	11.88	0.8	0.81	0.82	0.84	1.48	2.01	2.31	2.85	0	0	0.212	0.26	0.07	0.24
C2-68	0.66	5	6.48	8.64	9.84	11.88	0.7	0.72	0.73	0.76	3	4.11	4.76	5.98	0.269	0.41	0.122	0.17	0.27	0.41
C2-69	0.4	5	6.48	8.64	9.84	11.88	0.78	0.79	0.8	0.82	1.99	2.7	3.11	3.85	0.101	0.25	0.179	0.25	0.12	0.3
C2-71	0.8	9.69	5.43	7.36	8.47	10.3	0.73	0.75	0.76	0.79	3.16	4.39	5.13	6.45	0.373	0.47	0.136	0.2	0.29	0.36
C2-81	0.81	13.75	4.77	6.54	7.59	9.28	0.66	0.68	0.7	0.73	2.55	3.63	4.29	5.5	0.309	0.38	0.121	0.26	0.38	0.47
C2-82	0.25	5	6.48	8.64	9.84	11.88	0.8	0.82	0.82	0.84	1.28	1.74	2	2.46	0	0	0.184	1.04	0.06	0.24
C2-83	0.6	5	6.48	8.64	9.84	11.88	0.7	0.72	0.73	0.76	2.72	3.73	4.32	5.42	0.228	0.38	0.127	0.39	0.24	0.4

Time of Concentration Calculations

	Sheet Flow				Shallow Concentrated								Results
Drainage Basin	L [ft]	S [ft/ft]	n	T_t [min]	L [ft]	S [ft/ft]	n	T_t [min]	L [ft]	S [ft/ft]	V [ft/s]	T_t [min]	Total T_t [min]
C2-	150	0.04	0.30	5.24	100.00	0.02	0.02	0.20	206.65	0.02	5.00	0.69	6.12
C2-010E	150	0.051788052	0.3	4.708129893	100	0.015413615	0.016	0.2147912	74.58217214	1.0%	5	0.24860724	5.171528331
C2-014	150	0.053123696	0.3	4.648566869	100	0.053644352	0.3	2.1587781	89.11506778	2.8%	5	0.297050226	7.104395182
C2-014EL	150	0.053121734	0.3	4.648652728	100	0.05331036	0.3	2.16553	73.07525945	2.5%	5	0.243584198	7.057766879
C2-014ER	150	0.038625466	0.3	5.451629832	100	0.01043882	0.3	4.8937784	136.7659798	0.8%	5	0.455886599	10.80129483
C2-04	150	0.016835363	0.3	8.257564696	100	0.001359023	0.3	13.563024	263.6402277	1.1%	5	0.878800759	22.69938949
C2-06	150	0.028292187	0.3	6.369861095	100	0.012396257	0.016	0.2395099	46.39598918	0.4%	5	0.154653297	6.764024276
C2-22	150	0.026451738	0.3	6.587734902	100	0.014740323	0.016	0.2196419	82.43627421	0.6%	5	0.274787581	7.082164403
C2-31	150	0.02	0.30	8.64	100.00	0.00	0.02	0.38	159.41	0.02	5.00	0.53	9.55
C2-43	150	0.04	0.30	5.34	100.00	0.02	0.02	0.20	70.90	0.02	5.00	0.24	5.78
C2-52	150	0.03	0.30	5.76	100.00	0.01	0.02	0.27	75.29	0.01	5.00	0.25	6.29
C2-65	50	0.004901449	0.3	5.101286662	100	0.007596831	0.016	0.3059514	342.8713469	1.0%	5	1.14290449	6.550142594
C2-71	150	0.014172815	0.3	8.999847664	100	0.013226817	0.016	0.2318681	137.1725599	1.1%	5	0.457241866	9.688957658
C2-81	150	0.006623653	0.3	13.1648053	100	0.004793886	0.016	0.3851455	60.59957366	-0.5%	5	0.201998579	13.75194943

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

NO.	REVISION	BY	DATE

SJT — DESIGNED BY — 8-10-2022 DATE
BLM, SJT — DRAWN BY — 8-16-2022 DATE
SJT — CHECKED BY — 8-19-2022 DATE
BEM — APPROVED BY — 8-22-2022 DATE

STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED PROFESSIONAL ENGINEER · 08/24/2023

STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

STRM-C2 INLET CALCULATIONS (2 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

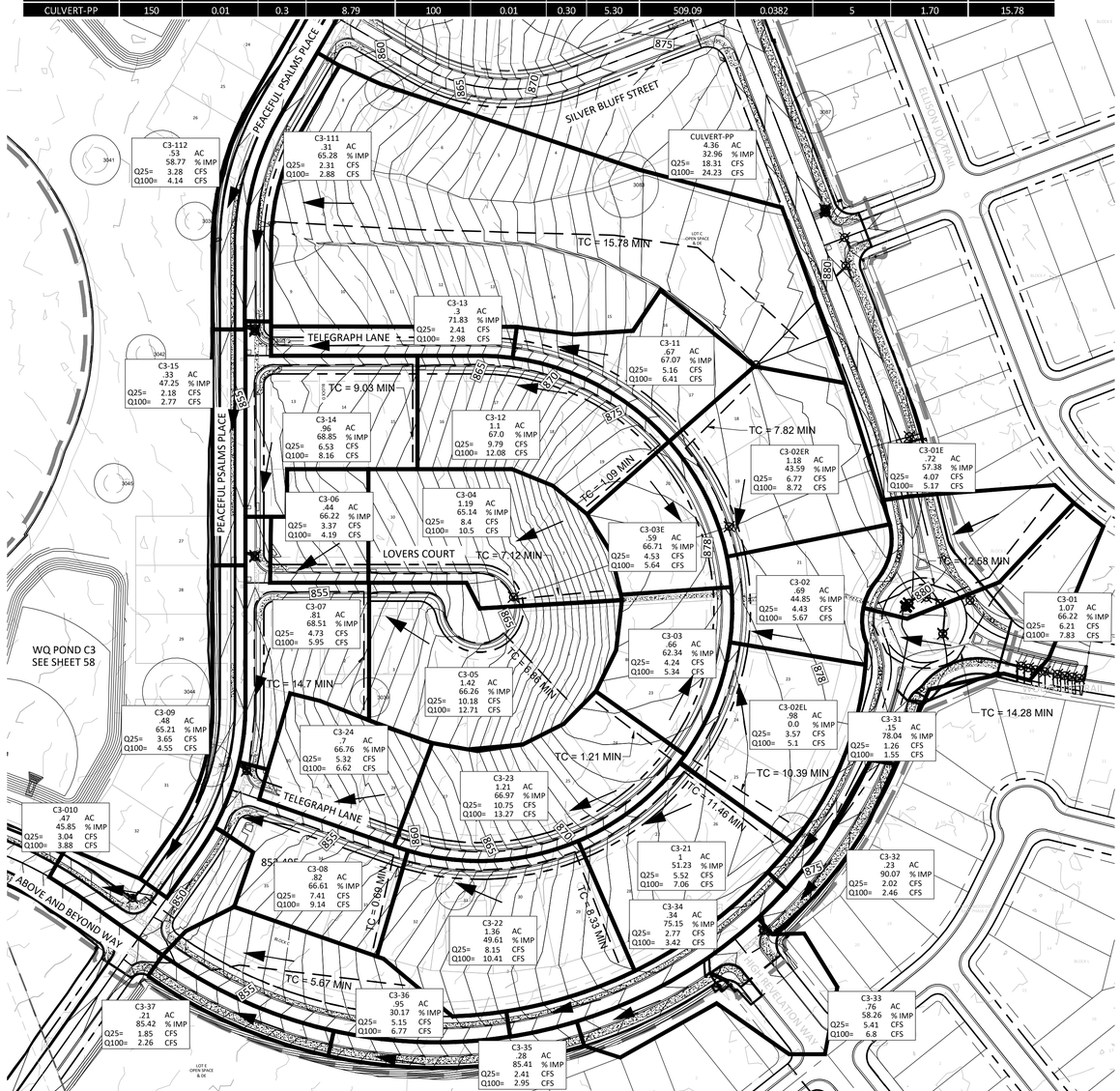
Project No: 22226-21

SHEET 11 of 93

2023-19-CON

Time of Concentration Calculations

	Sheet Flow				Shallow Concentrated							Results
Drainage Basin	L [ft]	S [ft/ft]	n	T_t [min]	L [ft]	S [ft/ft]	n	T_t [min]	L [ft]	S [ft/ft]	V [ft/s]	T_t [min]	Total T_c [min]
C3-01ER	150	0.02	0.3	8.17	50	0.021	0.016	0.093	125.31	0.0257	5	0.418	8.68
C3-01	150	0.01	0.3	11.23	50	0.011	0.3	2.370092	204.29	0.0137	5	0.681	14.28
C3-01E	150	0.01	0.3	10.42	50	0.019	0.3	1.8020188	107.14	0.0173	5	0.357	12.58
C3-02EL	150	0.01	0.3	9.86	50	0.014	0.016	0.1142962	125.31	0.0076	5	0.418	10.39
C3-03	150	0.04	0.3	5.40	50	0.022	0.016	0.090	132.99	0.0346	5	0.443	5.93
C3-04	150	0.03	0.3	6.59	50	0.022	0.016	0.090	132.99	0.0195	5	0.443	7.12
C3-05	150	0.03	0.3	6.27	50	0.016	0.016	0.1051112	145.98	0.0186	5	0.487	6.86
C3-07	150	0.01	0.3	13.53	50	0.030	0.016	0.078	328.68	0.0130	5	1.096	14.70
C3-08	150	0.00	0.3	0.00	50	0.046	0.016	0.062	187.74	0.0250	5	0.626	5*
C3-12	150	0.00	0.3	0.00	50	0.011	0.016	0.125	288.02	0.0340	5	0.960	5*
C3-14	150	0.02	0.3	7.85	50	0.036	0.016	0.070	331.42	0.0192	5	1.105	9.03
C3-21	150	0.01	0.3	10.94	50	0.020	0.016	0.095	128.60	0.0347	5	0.429	11.46
C3-22	150	0.02	0.3	7.63	50	0.044	0.016	0.063	192.94	0.0429	5	0.643	8.33
C3-23	150	0.00	0.3	0.00	50	0.022	0.016	0.0891087	337.42	0.0458	5	1.125	1.21
C3-36	150	0.04	0.3	5.20	50	0.044	0.016	0.064	121.33	0.0270	5	0.404	5.67
CULVERT-PP	150	0.01	0.3	8.79	100	0.01	0.30	5.30	509.09	0.0382	5	1.70	15.78



25-Year Flow to Inlets

Inlet ID	Q =CIA (cfs)	QCaptured (cfs)	JunctType	CurbHeight (in)	CurbLength (ft)	GutterSlope (ft/ft)	GutterWidth (ft)	CrossSlope, Sw (ft/ft)	CrossSlope, Sx (ft/ft)	InletDepth (ft)	GutterDepth (ft)	GutterSpread (ft)
C3-010	3.04	3.04	Curb	4	28.51	0.02	2	0.05	0.02	0.23	0.23	8.31
C3-02	4.43	4.43	Curb	4	34.61	0.02	2	0.05	0.02	0.25	0.25	9.73
C3-02ER	6.77	6.77	Curb	4	42.98	0.02	2	0.05	0.02	0.29	0.29	11.57
C3-04	8.4	8.4	Curb	4	47.94	0.02	2	0.05	0.02	0.31	0.31	12.61
C3-05	10.18	10.18	Curb	4	52.81	0.02	2	0.05	0.02	0.33	0.33	13.61
C3-06	3.37	3.37	Curb	4	30.06	0.02	2	0.05	0.02	0.23	0.23	8.88
C3-07	4.73	4.73	Curb	4	35.79	0.02	2	0.05	0.02	0.26	0.26	10
C3-08	7.41	7.41	Curb	4	44.99	0.02	2	0.05	0.02	0.3	0.3	12
C3-09	3.65	3.65	Curb	4	31.33	0.02	2	0.05	0.02	0.24	0.24	8.98
C3-11	5.16	5.16	Curb	4	37.42	0.02	2	0.05	0.02	0.27	0.27	10.37
C3-111	2.31	2.31	Curb	4	24.74	0.02	2	0.05	0.02	0.21	0.21	7.37
C3-112	3.28	3.28	Curb	4	29.65	0.02	2	0.05	0.02	0.23	0.23	8.58
C3-12	9.79	9.79	Curb	4	51.78	0.02	2	0.05	0.02	0.33	0.33	13.41
C3-13	2.41	2.41	Curb	4	25.28	0.02	2	0.05	0.02	0.21	0.21	7.51
C3-14	6.53	6.53	Curb	4	42.2	0.02	2	0.05	0.02	0.29	0.29	11.4
C3-15	2.18	2.18	Curb	4	24.01	0.02	2	0.05	0.02	0.2	0.2	7.18
C3-21	5.52	5.52	Curb	4	38.73	0.02	2	0.05	0.02	0.27	0.27	10.66
C3-22	8.15	8.15	Curb	4	47.21	0.02	2	0.05	0.02	0.31	0.31	12.46
C3-23	10.75	10.75	Curb	4	54.27	0.02	2	0.05	0.02	0.34	0.34	13.91
C3-24	5.32	5.32	Curb	4	38.01	0.02	2	0.05	0.02	0.27	0.27	10.5
C3-31	1.26	1.26	Curb	4	18.11	0.02	2	0.05	0.02	0.17	0.17	5.56
C3-32	2.02	2.02	Curb	4	23.08	0.02	2	0.05	0.02	0.2	0.2	6.94
C3-33	5.41	5.41	Curb	4	38.34	0.02	2	0.05	0.02	0.27	0.27	10.57
C3-34	2.77	2.77	Curb	4	27.17	0.02	2	0.05	0.02	0.22	0.22	7.98
C3-35	2.41	2.41	Curb	4	25.28	0.02	2	0.05	0.02	0.21	0.21	7.51
C3-36	5.15	5.15	Curb	4	37.39	0.02	2	0.05	0.02	0.27	0.27	10.36
C3-37	1.85	1.85	Curb	4	22.06	0.02	2	0.05	0.02	0.19	0.19	6.67

100-Year Flow to Inlets

Inlet ID	Q =CIA	QCaptured	JunctType	CurbHeight	CurbLength	GutterSlope	GutterWidth	CrossSlope, Sw	CrossSlope, Sx	InletDepth	GutterDepth	GutterSpread
C3-010	3.88	3.88	Curb	4	32.33	0.02	2	0.05	0.02	0.24	0.24	9.21
C3-02ER	8.72	8.72	Curb	4	48.85	0.02	2	0.05	0.02	0.32	0.32	12.8
C3-04	10.5	10.5	Curb	4	53.63	0.02	2	0.05	0.02	0.34	0.34	13.78
C3-05	10.18	10.18	Curb	4	52.81	0.02	2	0.05	0.02	0.33	0.33	13.61
C3-06	4.19	4.19	Curb	4	33.63	0.02	2	0.05	0.02	0.25	0.25	9.51
C3-07	5.95	5.95	Curb	4	40.24	0.02	2	0.05	0.02	0.28	0.28	10.98
C3-08	9.14	9.14	Curb	4	50.02	0.02	2	0.05	0.02	0.32	0.32	13.05
C3-09	4.55	4.55	Curb	4	35.09	0.02	2	0.05	0.02	0.26	0.26	9.84
C3-11	6.41	6.41	Curb	4	41.8	0.02	2	0.05	0.02	0.29	0.29	11.32
C3-111	2.88	2.88	Curb	4	27.72	0.02	2	0.05	0.02	0.22	0.22	8.12
C3-112	4.14	4.14	Curb	4	33.43	0.02	2	0.05	0.02	0.25	0.25	9.46
C3-12	12.08	12.08	Curb	4	57.53	0.02	2	0.05	0.02	0.35	0.35	14.56
C3-13	2.98	2.98	Curb	4	28.22	0.02	2	0.05	0.02	0.22	0.22	8.24
C3-14	8.16	8.16	Curb	4	47.25	0.02	2	0.05	0.02	0.31	0.31	12.47
C3-15	2.77	2.77	Curb	4	27.17	0.02	2	0.05	0.02	0.22	0.22	7.98
C-321	5.67	5.67	Curb	4	39.27	0.02	2	0.05	0.02	0.28	0.28	10.77
C-322	7.06	7.06	Curb	4	43.9	0.02	2	0.05	0.02	0.3	0.3	11.77
C-323	10.41	10.41	Curb	4	53.4	0.02	2	0.05	0.02	0.33	0.33	13.74
C-324	13.27	13.27	Curb	4	60.28	0.02	2	0.05	0.02	0.36	0.36	15.11
C-325	6.62	6.62	Curb	4	42.49	0.02	2	0.05	0.02	0.29	0.29	11.47
C3-31	1.55	1.55	Curb	4	20.14	0.02	2	0.05	0.02	0.18	0.18	6.15
C3-32	2.46	2.46	Curb	4	25.56	0.02	2	0.05	0.02	0.21	0.21	7.58
C3-33	2.95	2.95	Curb	4	28.07	0.02	2	0.05	0.02	0.22	0.22	8.2
C3-34	3.42	3.42	Curb	4	30.3	0.02	2	0.05	0.02	0.23	0.23	8.73
C3-35	2.95	2.95	Curb	4	28.07	0.02	2	0.05	0.02	0.22	0.22	8.2
C3-36	6.77	6.77	Curb	4	42.98	0.02	2	0.05	0.02	0.29	0.29	11.57
C3-37	2.26	2.26	Curb	4	24.46	0.02	2	0.05	0.02	0.21	0.21	7.3

HYDROLOGIC SUMMARY TABLE

Subarea Number	Area (acres)	Tc (min)	i2 (in/hr)	i10 (in/hr)	i25 (in/hr)	i100 (in/hr)	C2	C10	C25	C100	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)	Building/Drives (ac)	%	Roadway/Sidewalks (ac)	%	Grass (ac)	%
C3-01	1.07	14.28	4.7	6.45	7.49	9.16	0.75	0.76	0.77	0.8	3.76	5.28	6.21	7.83	0.108	10%	0.601	196%	0.36	34%
C3-01E	0.72	12.58	4.94	6.76	7.82	9.55	0.69	0.71	0.72	0.75	2.45	3.45	4.07	5.17	0.118	16%	0.295	56%	0.31	43%
C3-02	0.69	5	6.48	8.64	9.84	11.88	0.61	0.63	0.65	0.69	2.72	3.79	4.43	5.67	0.258	37%	0.053	4%	0.38	55%
C3-02EL	0.98	6.56	6.09	8.16	9.33	11.3	0.31	0.36	0.39	0.46	1.85	2.88	3.57	5.1	0	0%	0	0%	0.98	100%
C3-02ER	1.18	7.82	5.8	7.81	8.96	10.87	0.6	0.63	0.64	0.68	4.08	5.75	6.77	8.72	0.432	37%	0.08	0%	0.66	56%
C3-03	0.66	9.59	5.45	7.38	8.5	10.33	0.72	0.74	0.75	0.78	2.61	3.63	4.24	5.34	0.316	48%	0.098	9%	0.25	38%
C3-03E	0.59	5	6.48	8.64	9.84	11.88	0.75	0.77	0.78	0.8	2.88	3.93	4.53	5.64	0.307	52%	0.089	13%	0.2	34%
C3-04	1.19	7.12	5.96	8	9.16	11.1	0.74	0.76	0.77	0.79	5.26	7.24	8.4	10.5	0.659	55%	0.119	9%	0.42	35%
C3-05	1.42	6.86	6.02	8.07	9.24	11.19	0.75	0.76	0.77	0.8	6.4	8.78	10.18	12.71	0.762	54%	0.181	22%	0.48	34%
C3-06	0.44	5	6.48	8.64	9.84	11.88	0.75	0.76	0.77	0.8	2.14	2.92	3.37	4.19	0.237	54%	0.055	12%	0.15	34%
C3-07	0.81	14.7	4.64	6.38	7.41	9.07	0.76	0.78	0.79	0.81	2.86	4.02	4.73	5.95	0.342	42%	0.213	18%	0.26	32%
C3-08	0.82	0.69	7.91	10.39	11.64	13.94	0.75	0.77	0.78	0.8	4.86	6.53	7.41	9.14	0.387	47%	0.159	16%	0.27	33%
C3-09	0.48	5	6.48	8.64	9.84	11.88	0.74	0.76	0.77	0.79	2.32	3.16	3.65	4.55	0.118	24%	0.197	24%	0.17	35%
C3-010	0.47	5	6.48	8.64	9.84	11.88	0.61	0.64	0.66	0.69	1.87	2.6	3.04	3.88	0.009	2%	0.207	22%	0.26	55%
C3-11	0.67	5	6.48	8.64	9.84	11.88	0.75	0.77	0.78	0.8	3.28	4.47	5.16	6.41	0.34	51%	0.111	0%	0.22	33%
C3-111	0.31	5	6.48	8.64	9.84	11.88	0.74	0.76	0.77	0.79	1.47	2	2.31	2.88	0.031	10%	0.169	51%	0.11	36%
C3-112	0.53	9.59	5.45	7.38	8.5	10.33	0.7	0.72	0.73	0.76	2.01	2.8	3.28	4.14	0.093	18%	0.217	49%	0.22	42%
C3-12	1.1	1.09	7.75	10.19	11.45	13.71	0.75	0.77	0.78	0.8	6.41	8.61	9.79	12.08	0.578	53%	0.159	24%	0.36	33%
C3-13	0.3	5	6.48	8.64	9.84	11.88	0.78	0.8	0.81	0.83	1.54	2.1	2.41	2.98	0.074	24%	0.145	12%	0.09	30%
C3-14	0.96	9.03	5.56	7.51	8.64	10.5	0.76	0.78	0.79	0.81	4.07	5.61	6.53	8.16	0.44	46%	0.22	18%	0.3	31%
C3-15	0.33	5	6.48	8.64	9.84	11.88	0.62	0.65	0.66	0.7	1.34	1.87	2.18	2.77	0.02	6%	0.137	14%	0.18	54%
C3-21	1	11.46	5.12	6.97	8.06	9.82	0.65	0.67	0.69	0.72	3.31	4.67	5.52	7.06	0.431	43%	0.08	13%	0.49	49%
C3-22	1.36	8.33	5.7	7.68	8.82	10.71	0.64	0.66	0.68	0.71	4.95	6.94	8.15	10.41	0.57	42%	0.106	11%	0.69	51%
C3-23	1.21	1.21	7.7	10.13	11.39	13.64	0.75	0.77	0.78	0.8	7.03	9.45	10.75	13.27	0.628	52%	0.185	27%	0.4	33%
C3-24	0.7	5	6.48	8.64	9.84	11.88	0.75	0.77	0.78	0.8	3.39	4.61	5.32	6.62	0.379	55%	0.085	28%	0.23	33%
C3-31	0.15	5	6.48	8.64	9.84	11.88	0.83	0.84	0.84	0.86	0.81	1.1	1.26	1.55	0	0%	0.118	17%	0.03	20%
C3-32	0.23	5	6.48	8.64	9.84	11.88	0.9	0.91	0.91	0.92	1.32	1.77	2.02	2.46	0	0%	0.202	42%	0.02	9%
C3-33	0.76	5	6.48	8.64	9.84	11.88	0.69	0.72	0.73	0.76	3.4	4.67	5.41	6.8	0.027	4%	0.414	184%	0.32	42%
C3-34	0.34	5	6.48	8.64	9.84	11.88	0.81	0.82	0.83	0.84	1.78	2.41	2.77	3.42	0	0%	0.256	169%	0.08	23%
C3-35	0.28	5	6.48	8.64	9.84	11.88	0.87	0.88	0.89	0.9	1.57	2.11	2.41	2.95	0	0%	0.236	69%	0.04	14%
C3-36	0.95	5.67	6.3	8.43	9.61	11.62	0.51	0.54	0.56	0.61	3.05	4.35	5.15	6.77	0	0%	0.286	38%	0.66	70%
C3-37	0.21	5	6.48	8.64	9.84	11.88	0.87	0.88	0.89	0.9	1.2	1.61	1.85	2.26	0	0%	0.181	65%	0.03	14%
CULVERT-PP	4.36	15.78	4.5	6.21	7.22	8.85	0.53	0.56	0.58	0.63	10.35	15.19	18.31	24.23	1.437	33%	0	0%	2.92	67%

SCALE: 1" = 100'

LEGEND

- TIME OF CONCENTRATION PATH
- SUBBASIN BOUNDARY
- FLOW DIRECTION
- STORM MANHOLE
- STORM JUNCTION BOX
- WASTEWATER MANHOLE
- CURB INLET
- EXISTING CONTOURS(MAJOR)
- EXISTING CONTOURS(MINOR)
- PROPOSED CONTOURS(MAJOR)
- PROPOSED CONTOURS(MINOR)
- PHASE LINE
- BOUNDARY LINE

WARNING!
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NO.	REVISION	BY	DATE

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BLM, SJT — DRAWN BY — 8-16-2022 DATE
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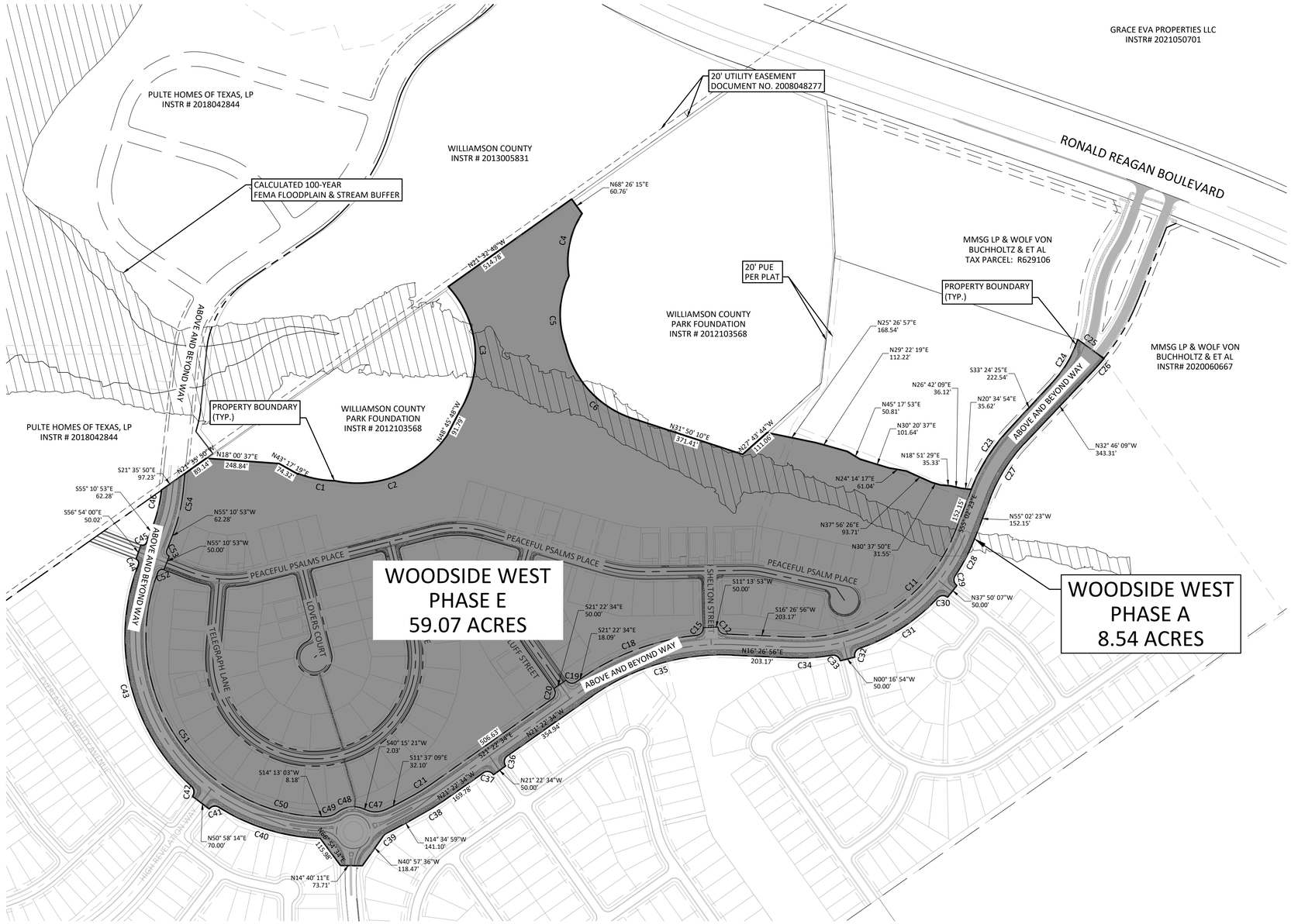
STRM-C3 INLET CALCULATIONS
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 12 of 93

2023-19-CON



Curve Table				
Curve #	Radius	Arc Length	Chord Length	Chord Direction
C1	369.970	127.108	126.48	N24° 52' 54.27"E
C2	366.250	436.871	411.43	N08° 01' 08.73"W
C3	349.087	461.049	428.26	N81° 10' 09.96"W
C4	301.169	222.216	217.21	S64° 22' 50.35"E
C5	302.771	238.851	232.71	S73° 10' 03.29"E
C6	343.114	379.858	360.75	N59° 48' 37.71"E
C11	565.000	704.958	660.11	S19° 17' 43.62"E
C12	25.000	37.816	34.31	S57° 53' 52.87"W
C15	25.000	37.816	34.31	S35° 26' 06.03"E
C18	835.000	426.632	422.01	S06° 44' 19.62"E
C19	25.000	39.270	35.36	S23° 37' 26.25"W
C20	25.000	39.270	35.36	S66° 22' 33.75"E
C21	615.000	66.947	66.91	S18° 15' 27.16"E
C23	635.000	244.059	242.56	S44° 01' 44.85"E
C24	374.500	164.828	163.50	S46° 00' 56.12"E
C25	1617.310	108.927	108.91	S50° 48' 03.12"W
C26	746.815	50.299	50.29	N34° 43' 38.39"W
C27	565.000	217.155	215.82	N44° 01' 44.85"W
C28	635.000	142.522	142.22	N48° 36' 35.86"W
C29	25.000	37.374	33.99	N85° 00' 27.87"W

Curve Table				
Curve #	Radius	Arc Length	Chord Length	Chord Direction
C30	25.000	37.374	33.99	N09° 20' 13.23"E
C31	635.000	319.896	316.52	N19° 03' 30.84"W
C32	25.000	37.374	33.99	N47° 27' 14.90"W
C33	25.000	37.374	33.99	N46° 53' 26.20"E
C34	635.000	137.271	137.00	N10° 15' 21.40"E
C35	765.000	505.030	495.91	N02° 27' 48.85"W
C36	25.000	39.270	35.36	N66° 22' 33.75"W
C37	25.000	39.270	35.36	N23° 37' 26.25"E
C38	685.000	74.762	74.72	N18° 14' 57.74"W
C39	50.000	23.018	22.82	N27° 46' 17.91"W
C40	684.987	364.830	360.53	N30° 51' 54.66"E
C41	25.000	37.155	33.83	N03° 32' 49.17"E
C42	25.000	37.155	33.83	S81° 36' 19.69"E
C43	685.000	825.397	776.36	S89° 39' 43.58"E
C44	15.000	23.572	21.22	N79° 50' 16.38"E
C45	15.000	23.562	21.21	S10° 10' 53.30"E
C46	463.500	121.947	121.60	S62° 43' 07.39"E
C47	81.425	40.934	40.50	S02° 28' 58.26"W
C48	85.000	94.305	89.54	S08° 02' 02.28"W
C49	81.425	29.295	29.14	S13° 14' 54.40"E

Curve Table				
Curve #	Radius	Arc Length	Chord Length	Chord Direction
C50	613.577	167.155	166.64	S22° 24' 53.54"W
C51	615.000	998.847	892.63	S78° 20' 08.51"W
C52	15.000	23.550	21.20	N10° 09' 31.62"W
C53	15.000	23.562	21.21	S79° 49' 06.70"W
C54	536.500	141.153	140.75	N62° 43' 07.39"W

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STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
08/24/2023

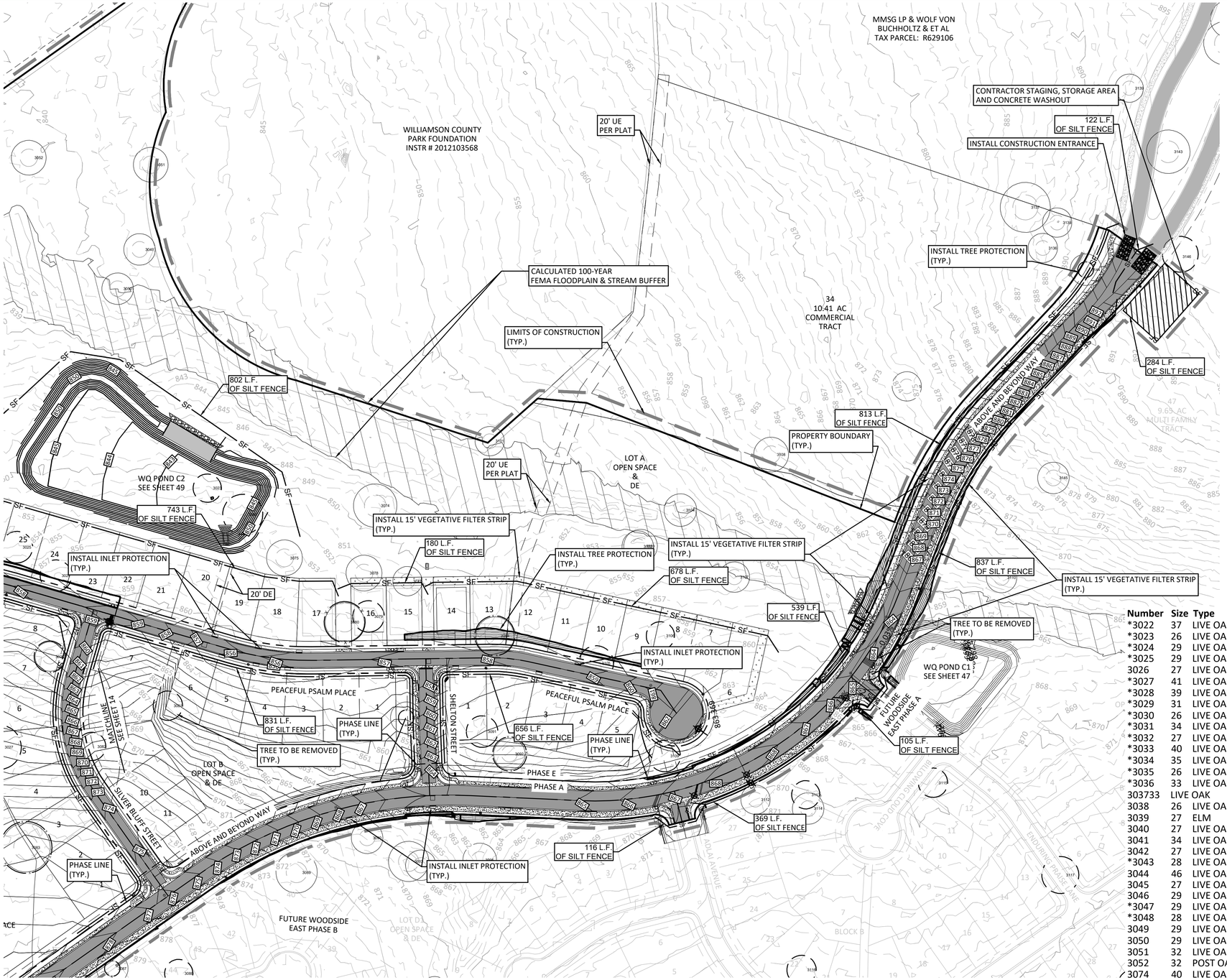
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

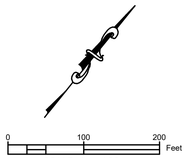
SITE AREA MAP
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 14 of 95

2023-19-CON





LEGEND

- #### = REMOVE TREE
- #### = TREE TO BE PRESERVED
- x x = TREE PROTECTION
- SF = SILT FENCE
- =ROCK BERM
- =LIMITS OF CONSTRUCTION
- = 15' VEGETATIVE FILTER STRIP
- = INLET PROTECTION
- = PROPERTY BOUNDARY

NOTES:

1. Topography based upon LIDAR aerial mapping, date August 20, 2014 by Mckim & Creed.
2. All proposed development of this site conforms to the City of Georgetown's subdivision regulations and/or the development agreement.
3. Limits of construction line has been offset for clarity.
4. All temporary erosion and sedimentation controls shall be inspected every 7 days and following every rainfall event.
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HERITAGE TREE LIST

Number	Size	Type	Multi	Number	Size	Type	Multi
*3022	37	LIVE OAK	(19-18-18)	3076	31	LIVE OAK	(16-16-14)
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*3025	29	LIVE OAK		*3079	29	LIVE OAK	(22-14)
3026	27	LIVE OAK	(18-9-8)	3080	36	LIVE OAK	(19-18-16)
*3027	41	LIVE OAK	(31-19)	*3081	27	LIVE OAK	(16-12-10)
*3028	39	LIVE OAK	(31-15)	*3082	26	LIVE OAK	(15-13-8)
*3029	31	LIVE OAK		3084	35	LIVE OAK	
*3030	26	LIVE OAK	(14-12-11)	*3091	29	LIVE OAK	
*3031	34	LIVE OAK		3092	29	LIVE OAK	
*3032	27	LIVE OAK MULTI	(19-16)	3101	27	LIVE OAK	
*3033	40	LIVE OAK		3102	29	LIVE OAK	(22-14)
*3034	35	LIVE OAK	(19-16-16)	3103	31	LIVE OAK	(21-20)
*3035	26	LIVE OAK	(19-14)	3104	30	LIVE OAK	(17-15-11)
*3036	33	LIVE OAK	(18-17-13)	*3105	32	LIVE OAK	
303733		LIVE OAK	(19-16-12)	*3106	26	LIVE OAK	(15-13-8)
3038	26	LIVE OAK	(20-12)	3107	28	LIVE OAK	(21-14)
3039	27	ELM	(13-11-10-6)	3108	32	LIVE OAK	(18-14-13)
3040	27	LIVE OAK		*3109	29	LIVE OAK	
3041	34	LIVE OAK	(26-16)	*3111	29	LIVE OAK	(20-17)
3042	27	LIVE OAK		3112	27	LIVE OAK	
*3043	28	LIVE OAK		3135	27	LIVE OAK	(20-14)
3044	46	LIVE OAK	(27-20-18)	3136	27	LIVE OAK	(12-11-11-7)
3045	27	LIVE OAK		3137	46	LIVE OAK	(34-23)
3046	29	LIVE OAK		3138	27	LIVE OAK	(19-11-5)
*3047	29	LIVE OAK		3139	26	LIVE OAK	(13-13-12)
*3048	28	LIVE OAK		*3140	33	LIVE OAK	(23-20)
3049	29	LIVE OAK	(21-16)	3141	35	LIVE OAK	
3050	29	LIVE OAK	(22-14)	3142	40	LIVE OAK	(35-10)
3051	32	LIVE OAK	(22-19)	3143	40	LIVE OAK	(16-16-16-15)
3052	32	POST OAK		3144	29	LIVE OAK	(17-15-11)
3074	40	LIVE OAK	(20-16-15-9)	3146	33	LIVE OAK	(15-14-14-8)
3075	33	LIVE OAK	(19-16-12)	3147	26	LIVE OAK	

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STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED PROFESSIONAL ENGINEER · 08/24/2023

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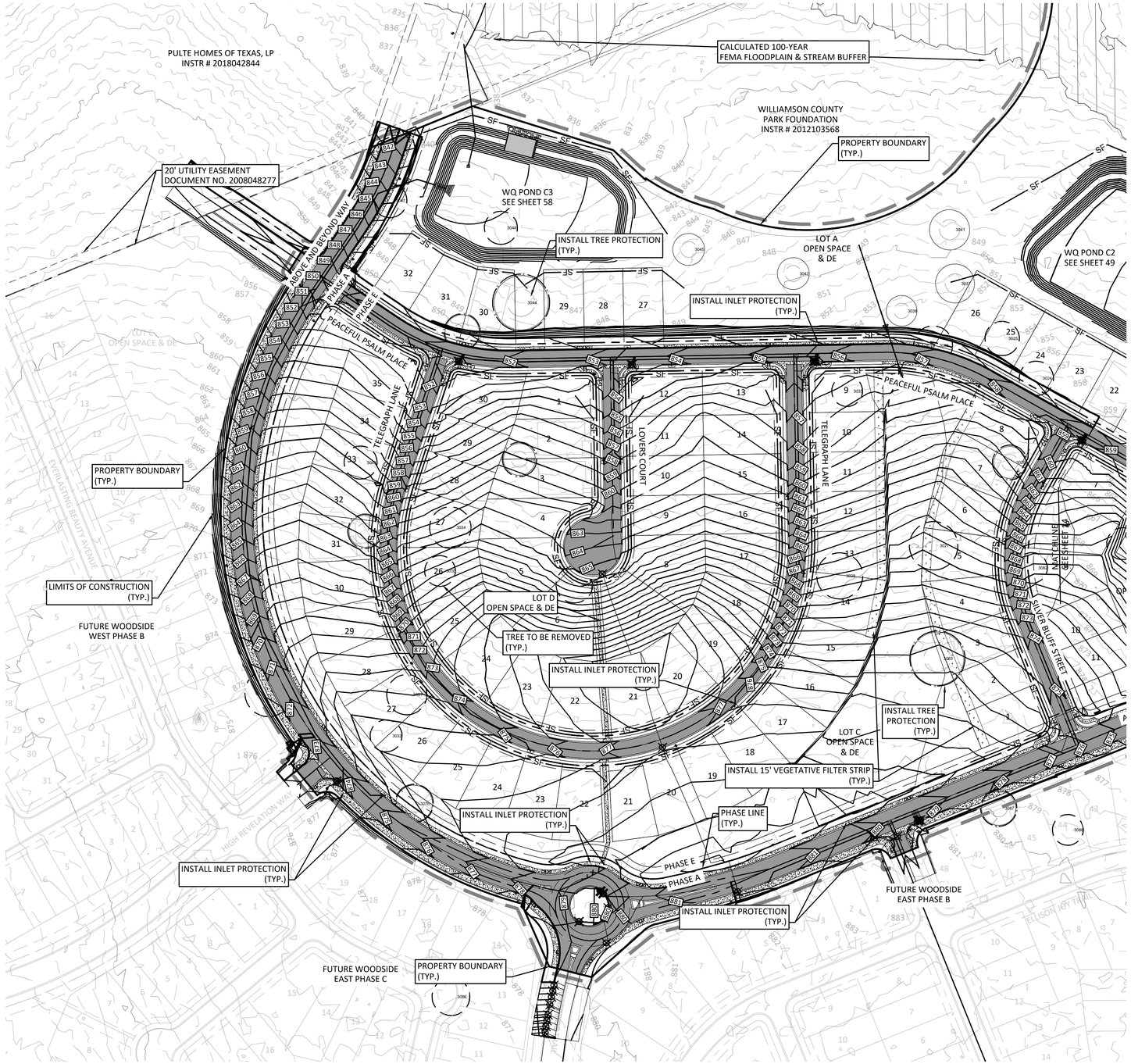
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

EROSION & SEDIMENTATION PLAN (1 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 14 of 93



0 100 200 Feet

SCALE: 1" = 100'

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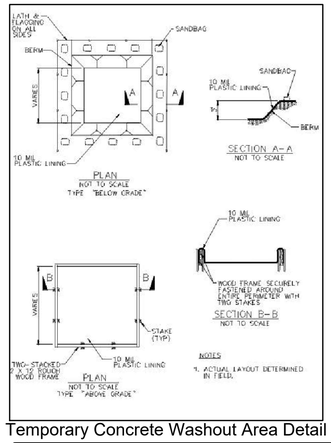
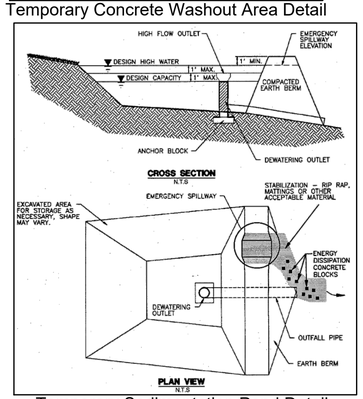
EROSION & SEDIMENTATION PLAN (2 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 15 of 93



Temporary Concrete Washout Area Detail

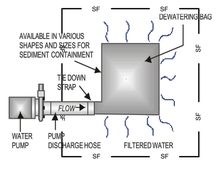


Temporary Sedimentation Pond Detail

TEMPORARY POND DEWATERING

1. Place dewatering pump at/in pond to be dewatered.
2. The pump inlet shall have a floating intake to pump water from the surface of the pond.
3. Pump discharge hose is attached to sediment dewatering bag.
4. Sediment dewatering bag is located as shown.
5. Secondary containment consisting of silt fencing is installed around the sediment dewatering bag.
6. The pump is run until the pond is dewatered.
7. Inspect the flow conditions, bag condition, bag capacity and secondary containment during operation of the pump to insure the system is operating effectively.
8. Replace the bag when it no longer filters sediment or passes water at a reasonable rate. The bag is disposed of offsite.

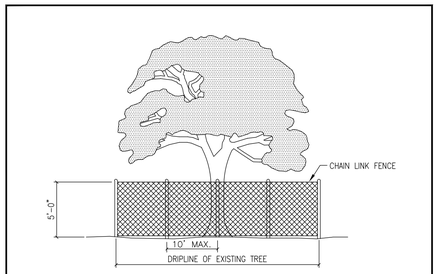
Place Silt Fence Around Bag



Sediment Dewatering Bag

Minimum Bag Size - 6' x 6'

N.T.S

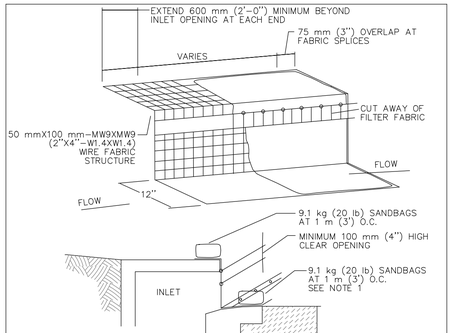


NOTES:

1. TREE PROTECTION FENCES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING).
2. FENCES SHALL COMPLETELY SURROUND THE TREE, OR CLUSTERS OF TREES; WILL BE LOCATED AT THE OUTERMOST LIMIT OF THE TREE BRANCHES (DRIPLINE), AND WILL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROJECT IN ORDER TO PREVENT THE FOLLOWING:
   A. SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC, OR STORAGE OF EQUIPMENT OR MATERIALS.
   B. ROOT ZONE DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN SIX INCHES (6") CUT OR FILL, OR TRENCHING NOT REVIEWED AND AUTHORIZED BY THE CITY.
   C. WOUNDS TO EXPOSED ROOTS, TRUNKS OR LIMBS BY MECHANICAL EQUIPMENT.
   D. OTHER ACTIVITIES DETRIMENTAL TO TREES, SUCH AS CHEMICAL STORAGE, CEMENT TRUCK CLEANING AND FIRE.
3. EXCEPTIONS TO INSTALLING FENCES AT TREE DRIPLINES MAY BE PERMITTED IN THE FOLLOWING CASES:
   A. WHERE PERMEABLE PAVING IS TO BE INSTALLED, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA.
   B. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCE NO CLOSER THAN SIX FEET (6'-0") TO BUILDING.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

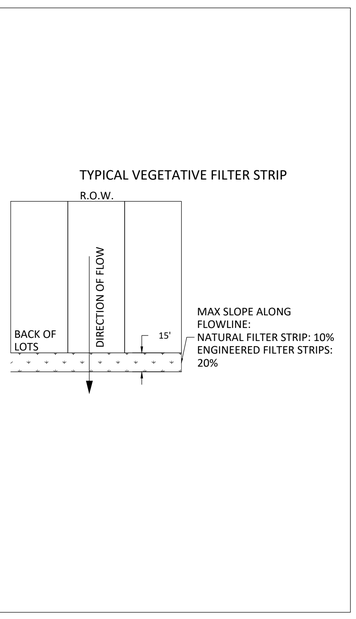
GEORGETOWN TEXAS	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS TREE PROTECTION – CHAIN LINK FENCE	ADOPTED 6/21/2006 EC09 NTS 1/2003 MRS TRB

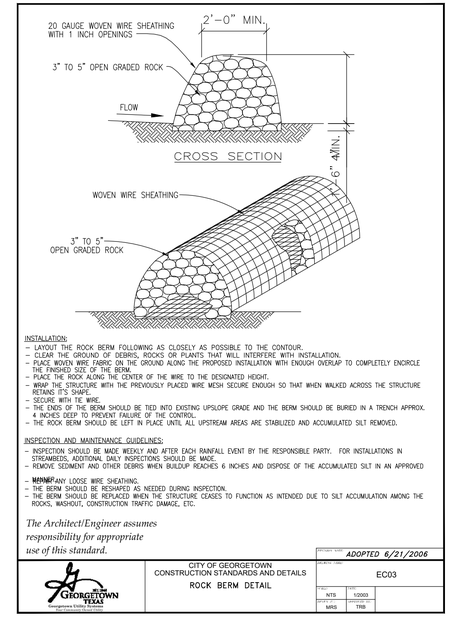


NOTES:

1. TO HOLD THE FILTER DIKE IN PLACE, 9.1 kg (20 lb) SANDBAGS SHALL BE USED AT 1 m (3') O.C. WHERE MINIMUM CLEARANCES CAUSE TRAFFIC TO DRIVE IN THE GUTTER, THE CONTRACTOR MAY SUBSTITUTE A 25 mm X 100 mm (1" x4") BOARD, SECURED WITH ¼" OR ⅜" CONCRETE SCREWS. THE ¼" OR ⅜" CONCRETE SCREWS SHALL BE ATTACHED TO THE GUTTER BY DRILLING AN APPROPRIATE PILOT HOLE WITH A CONCRETE BIT AND INSERT PLASTIC FASTENERS. THE TOP OF THE SCREW SHALL BE RECESSED BELOW THE TOP OF THE BOARD. THE SCREWS SHALL BE PLACED ON 1 m (3') O.C. THIS METHOD IS USED IN LIEU OF SANDBAGS, IN THE GUTTER ONLY, TO HOLD THE FILTER DIKE IN PLACE. UPON REMOVAL, EITHER LEAVE THE PLASTIC FASTENERS IN PLACE, OR REMOVE THE PLASTIC FASTENERS, CLEAN ANY DIRT/DEBRIS FROM THE SCREW LOCATIONS, APPLY CHEMICAL SANDING AGENT AND APPLY NON–SHRINK GROUT FLUSH WITH THE SURFACE OF THE GUTTER. THIS METHOD SHALL NOT BE USED ON THE INLET IN THE LIEU OF SANDBAGS.
2. A SECTION OF FILTER FABRIC SHALL BE REMOVED AS SHOWN ON THIS DETAIL OR AS DIRECTED BY THE ENGINEER OR DESIGNATED REPRESENTATIVE. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR HOG RINGS AT THIS LOCATION.
3. DAILY INSPECTION SHALL BE MADE BY THE CONTRACTOR AND SILT ACCUMULATION MUST BE REMOVED WHEN DEPTH REACHES 50 mm (2").
4. CONTRACTOR SHALL MONITOR THE PERFORMANCE OF INLET PROTECTION DURING EACH RAINFALL EVENT AND IMMEDIATELY REMOVE THE INLET PROTECTIONS IF THE STORMWATER BEGINS TO OVERTOP THE CURB.
5. INLET PROTECTIONS SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

DEPARTMENT OF WATERSHED PROTECTION AND DEVELOPMENT REVIEW	FILTER DIKE CURB INLET PROTECTION	
RECORD COPY SIGNED BY HENRY CASAS ADOPTED	1/2/07 THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 628S–2





INSTALLATION:
- LAYOUT THE ROCK BERM FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- PLACE WOVEN WIRE FABRIC ON THE GROUND ALONG THE PROPOSED INSTALLATION WITH ENOUGH OVERLAP TO COMPLETELY ENCIRCLE THE FINISHED SIZE OF THE BERM.
- PLACE THE ROCK ALONG THE CENTER OF THE WIRE TO THE DESIGNATED HEIGHT.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE RETAINS IT'S SHAPE.
- SECURE WITH TIE WIRE.
- THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROX. 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.
- THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL EVENT BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE.
- REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER.
- REMOVE ANY LOOSE WIRE SHEATHING.
- THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION.
- THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

GEORGETOWN TEXAS	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS ROCK BERM DETAIL	ADOPTED 6/21/2006 EC03 NTS 1/2003 MRS TRB

INSTALLATION:
- CLEAR THE AREA OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- GRADE THE AREA FOR THE ENTRANCE TO FLOW BACK ON TO THE CONSTRUCTION SITE. RUNOFF FROM THE STABILIZED CONSTRUCTION
- PLACE GEOTEXTILE FABRIC AS APPROVED BY THE CITY.
- PLACE ROCK AS APPROVED BY THE CITY.

INSPECTIONS AND MAINTENANCE GUIDELINES:
- THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
- ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ON TO PUBLIC RIGHTS–OF–WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.
- WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY.
- WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
- ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE BY USING APPROVED METHODS.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

GEORGETOWN TEXAS	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS STABILIZED CONSTRUCTION ENTRANCE	ADOPTED 6/21/2006 EC06 NTS 1/2003 MRS TRB

GUIDELINES FOR DESIGN AND INSTALLATION OF TEMPORARY EROSION AND SEDIMENTATION CONTROLS

TYPE OF STRUCTURE	REACH LENGTH	MAXIMUM DRAINAGE AREA	SLOPE
SILT FENCE	N/A	2 ACRES	0 – 10%
	200 FEET	2 ACRES	10 – 20%
	100 FEET	1 ACRE	20 – 30%
	50 FEET	1/2 ACRE	> 30%
TRIANGLE FILTER DIKE	100 FEET	1/2 ACRE	< 30% SLOPE
	50 FEET	1/4 ACRE	> 30% SLOPE
ROCK BERM *, **	500 FEET	< 5 ACRES	0 – 10%

* FOR ROCK BERM DESIGN WHERE PARAMETERS ARE OTHER THAN STATED, DRAINAGE AREA CALCULATIONS AND ROCK BERM DESIGN MUST BE SUBMITTED FOR REVIEW.

** HIGH SERVICE ROCK BERMS MAY BE REQUIRED IN AREAS OF ENVIRONMENTAL SIGNIFICANCE AS DETERMINED BY THE CITY OF GEORGETOWN.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

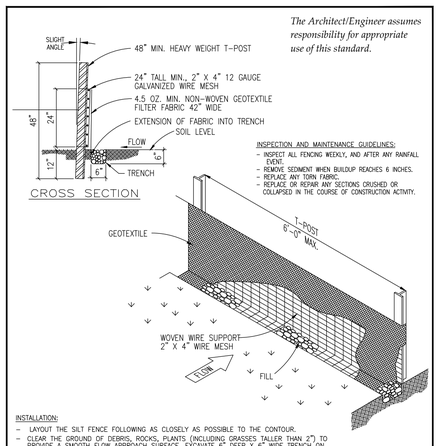
GEORGETOWN TEXAS	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS TEMPORARY EROSION AND SEDIMENTATION CONTROL GUIDELINES	ADOPTED 6/21/2006 EC01 NTS 1/2003 MRS TRB

NOTE: THIS SECTION IS INTENDED TO ASSIST THOSE PERSONS PREPARING WATER POLLUTION ABATEMENT PLANS (WPAP) OR STORM WATER POLLUTION PREVENTION PLANS (SWPP) THAT COMPLY WITH FEDERAL, STATE AND/OR LOCAL STORM WATER REGULATIONS.

1. THE CONTRACTOR TO INSTALL AND MAINTAIN EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING, GRADING, OR EXCAVATION). CONTRACTOR TO REMOVE EROSION/SEDIMENTATION CONTROLS AT THE COMPLETION OF PROJECT AND GRASS RESTORATION.
2. ALL PROJECTS WITHIN THE RECHARGE ZONE OF THE EDWARD'S AQUIFER SHALL SUBMIT A BEST MANAGEMENT PRACTICES AND WATER POLLUTION AND ABATEMENT PLAN TO THE TNRCC FOR APPROVAL PRIOR TO ANY CONSTRUCTION.
3. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS TO BE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN AND WATER POLLUTION ABATEMENT PLAN. DEVIATIONS FROM THE APPROVED PLAN MUST BE SUBMITTED TO AND APPROVED BY THE OWNER'S REPRESENTATIVE.
4. ALL PLANTING SHALL BE DONE BETWEEN MAY 1 AND SEPTEMBER 15 EXCEPT AS SPECIFICALLY AUTHORIZED IN WRITING. IF PLANTING IS AUTHORIZED TO BE DONE OUTSIDE THE DATES SPECIFIED, THE SEED SHALL BE PLANTED WITH THE ADDITION OF WINTER FESCUE (KENTUCKY 31) AT A RATE OF 100lb/ACRE. GRASS SHALL BE COMMON BERMUDA GRASS, HULLED, MINIMUM 80% PURE LIVE SEED. ALL GRASS SEED SHALL BE FREE FROM NOXIOUS WEED, GRADE "A" RECENT CROP, RECLEANED AND TREATED WITH APPROPRIATE FUNGICIDE AT TIME OF MIXING. SEED SHALL BE FURNISHED IN SEALED, STANDARD CONTAINERS WITH DEALER'S GUARANTEED ANALYSIS.
5. ALL DISTURBED AREAS TO BE RESTORED AS NOTED IN THE WATER POLLUTION ABATEMENT PLAN.
6. THE PLANTED AREA TO BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL; BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF FOUR (4) INCHES. THE IRRIGATION TO OCCUR AT 10–DAY INTERVALS DURING THE FIRST TWO MONTHS TO INSURE GERMINATION AND ESTABLISHMENT OF THE GRASS . RAINFALL OCCURRENCES OF 1/2 INCH OR GREATER TO POSTPONE THE WATERING SCHEDULE ONE WEEK.
7. RESTORATION TO BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1–1/2 INCHES HIGH WITH 95± COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 25 SQUARE FEET EXIST.
8. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL TO BE PLACED IN ALL AREAS DISTURBED BY CONSTRUCTION.
9. THE CONTRACTOR TO HYDROMULCH OR SOD (AS SHOWN ON PLANS) ALL EXPOSED CUTS AND FILLS UPON COMPLETION OF CONSTRUCTION.
10. EROSION AND SEDIMENTATION CONTROLS TO BE INSTALLED OR MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILDUP WITHIN TREE DRIPLINE.
11. TO AVOID SOIL COMPACTION, CONTRACTOR SHALL NOT ALLOW VEHICULAR TRAFFIC, PARKING, OR STORAGE OF EQUIPMENT OR MATERIALS IN THE TREE DRIPLINE AREAS.
12. WHERE A FENCE IS CLOSER THAN FOUR (4) FEET TO A TREE TRUNK, PROTECT THE TRUNK WITH STRAPPED–ON PLANKING TO A HEIGHT OF EIGHT (8) FEET (OR TO THE LIMITS OF LOWER BRANCHING) IN ADDITION TO THE FENCING.
13. TREES TO BE REMOVED IN A MANNER WHICH DOES NOT IMPACT TREES TO BE PRESERVED.
14. ANY ROOT EXPOSED BY CONSTRUCTION ACTIVITY TO BE PRUNED FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOPSOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN TWO DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE AND MINIMIZES WATER LOSS DUE TO EVAPORATION.
15. CONTRACTOR TO PRUNE VEGETATION TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC, AND EQUIPMENT BEFORE DAMAGE OCCURS. (RIPPING OF BRANCHES, ETC.). ALL FINISHED PRUNING TO BE DONE ACCORDING TO RECOGNIZED, APPROVED STANDARDS OF THE INDUSTRY (REFERENCE THE "NATIONAL ARBORIST ASSOCIATION PRUNING STANDARDS FOR SHADE TREES").
16. THE CONTRACTOR IS TO INSPECT THE CONTROLS AT WEEKLY INTERVALS AND AFTER EVERY RAINFALL EXCEEDING 1/4 INCH TO VERIFY THAT THEY HAVE NOT BEEN SIGNIFICANTLY DISTURBED. ANY ACCUMULATED SEDIMENT AFTER A SIGNIFICANT RAINFALL TO BE REMOVED AND PLACED IN THE OWNER DESIGNATED SPOIL DISPOSAL SITE. THE CONTRACTOR TO CONDUCT PERIODIC INSPECTIONS OF ALL EROSION/SEDIMENTATION CONTROLS AND TO MAKE ANY REPAIRS OR MODIFICATIONS NECESSARY TO ASSURE CONTINUED EFFECTIVE OPERATION OF EACH DEVICE.
17. WHERE THERE IS TO BE AN APPROVED GRADE CHANGE, IMPERMEABLE PAVING SURFACE, TREE WELL, OR OTHER SUCH SITE DEVELOPMENT IMMEDIATELY ADJACENT TO A PROTECTED TREE, ERECT THE FENCE APPROXIMATELY TWO TO FOUR FEET (2'–4") BEHIND THE AREA IN QUESTION.
18. NO ABOVE AND/OR BELOW GROUND TEMPORARY FUEL STORAGE FACILITIES TO BE STORED ON THE PROJECT SITE.
19. IF EROSION AND SEDIMENTATION CONTROL SYSTEMS ARE EXISTING FROM PRIOR CONTRACTS, OWNER'S REPRESENTATIVE AND THE CONTRACTOR TO EXAMINE THE EXISTING EROSION AND SEDIMENTATION CONTROL SYSTEMS FOR DAMAGE PRIOR TO CONSTRUCTION. ANY DAMAGE TO PREEXISTING EROSION AND SEDIMENTATION CONTROLS NOTED TO BE REPAIRED AT OWNERS EXPENSE.
20. INTENTIONAL RELEASE OF VEHICLE OR EQUIPMENT FLUIDS ONTO THE GROUND IS NOT ALLOWED. CONTAMINATED SOIL RESULTING FROM ACCIDENTAL SPILL TO BE REMOVED AND DISPOSED OF PROPERLY.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

GEORGETOWN TEXAS	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS EROSION and SEDIMENTATION and TREE PROTECTION NOTES	ADOPTED 6/21/2006 EC01A NTS 1/2003 MRS TRB



INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECT ALL FENCING WEEKLY, AND AFTER ANY RAINFALL EVENT.
- REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.
- REPLACE ANY TORN FABRIC.
- REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY.

INSTALLATION:
- LAYOUT THE SILT FENCE FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS, PLANTS (INCLUDING GRASSES TALLER THAN 2") TO PROVIDE A SMOOTH FLOW APPROACH SURFACE. EXCAVATE 6" DEEP X 6" WIDE TRENCH ON UPSTREAM SIDE OF FACE PER PLANS.
- DRIVE THE HEAVY DUTY T–POST AT LEAST 12 INCHES INTO THE GROUND AND AT A SLIGHT ANGLE TOWARDS THE FLOW.
- ATTACH THE 2" X 4" 12 GAUGE WELDED WIRE MESH TO THE T–POST WITH 11 1/2 GAUGE GALVANIZED T–POST CLIPS. THE TOP OF THE WIRE TO BE 24" ABOVE GROUND LEVEL. THE WELDED WIRE MESH TO BE OVERLAPPED 6" AND TIED AT LEAST 6 TIMES WITH HOG RINGS.
- THE SILT FENCE TO BE INSTALLED WITH A SKIRT A MINIMUM OF 6" WIDE PLACED ON THE UPHILL SIDE OF THE FENCE INSIDE EXCAVATED TRENCH. THE FABRIC TO OVERLAP THE TOP OF THE WIRE BY 1".
- ANCHOR THE SILT FENCE BY BACKFILLING WITH EXCAVATED DIRT AND ROCKS (NOT LARGER THAN 2"). –
- GEOTEXTILE SPLICES SHOULD BE A MINIMUM OF 18" WIDE ATTACHED IN AT LEAST 6 PLACES. SPLICES IN CONGENTRATED FLOW AREAS WILL NOT BE ACCEPTED.
- SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE–STORM FLOW OR DRAINAGE.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

GEORGETOWN TEXAS	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS SILT FENCE DETAIL	ADOPTED 6/21/2006 EC02 NTS 1/2003 MRS TRB

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

NO.	REVISION	BY	DATE

SJT — DESIGNED BY — 8-10-2022 DATE
BLM, SJT — DRAWN BY — 8-16-2022 DATE
SJT — CHECKED BY — 8-19-2022 DATE
BEM — APPROVED BY — 8-22-2022 DATE

STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED PROFESSIONAL ENGINEER · 08/24/2023

STEGER BIZZELL

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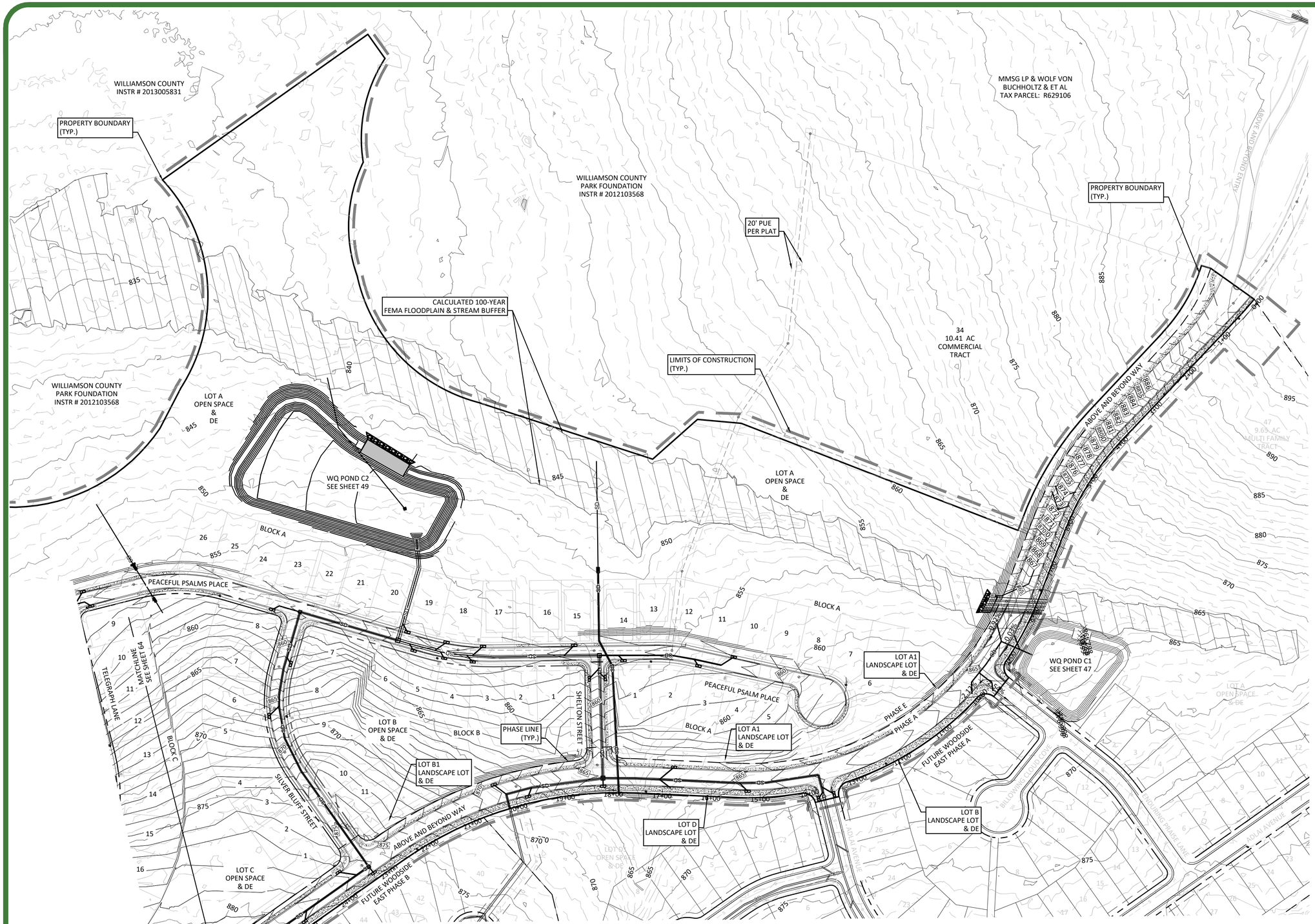
EROSION AND SEDIMENTATION DETAILS
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 16 of 93

2023-19-CON



LEGEND

- PROPOSED STORM LINE
- EXISTING STORM LINE
- PROPOSED WASTEWATER MANHOLE
- EXISTING WASTEWATER MANHOLE
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- FUTURE CURB INLET
- STORM MANHOLE
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE
- 100 MAJOR EXISTING CONTOUR
- 100 MINOR EXISTING CONTOUR
- PROPERTY BOUNDARY

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

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STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
08/24/2023

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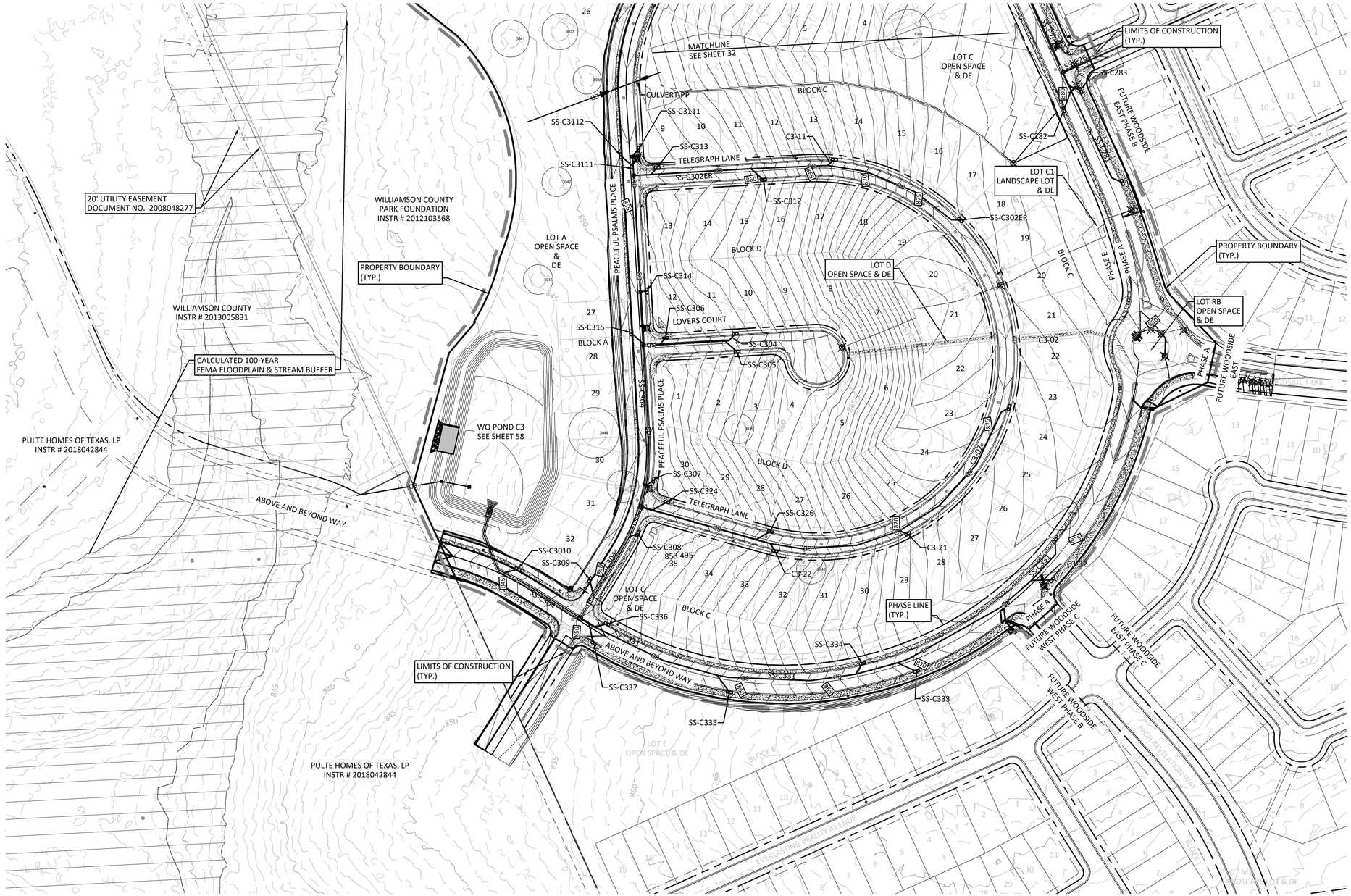
OVERALL STORMSEWER PLAN (1 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 32 of 93

2023-19-CON



0 100 200 Feet

SCALE: 1" = 100'

LEGEND

- PROPOSED STORM LINE
- EXISTING STORM LINE
- PROPOSED WASTEWATER MANHOLE
- EXISTING WASTEWATER MANHOLE
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- FUTURE CURB INLET
- STORM MANHOLE
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE
- 100 MAJOR EXISTING CONTOUR
- 100 MINOR EXISTING CONTOUR
- PROPERTY BOUNDARY

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

NO.	REVISION	BY	DATE

KYT — DESIGNED BY: — ~~8/8/2022~~ DATE
BLM, SJT — DRAWN BY: — 8-16-2022 DATE
SJT — CHECKED BY: — 8-19-2022 DATE
BEM — APPROVED BY: — 8-22-2022 DATE

STATE OF TEXAS — BRYAN ERIC MOORE — 98920 — LICENSED PROFESSIONAL ENGINEER — 08/24/2023

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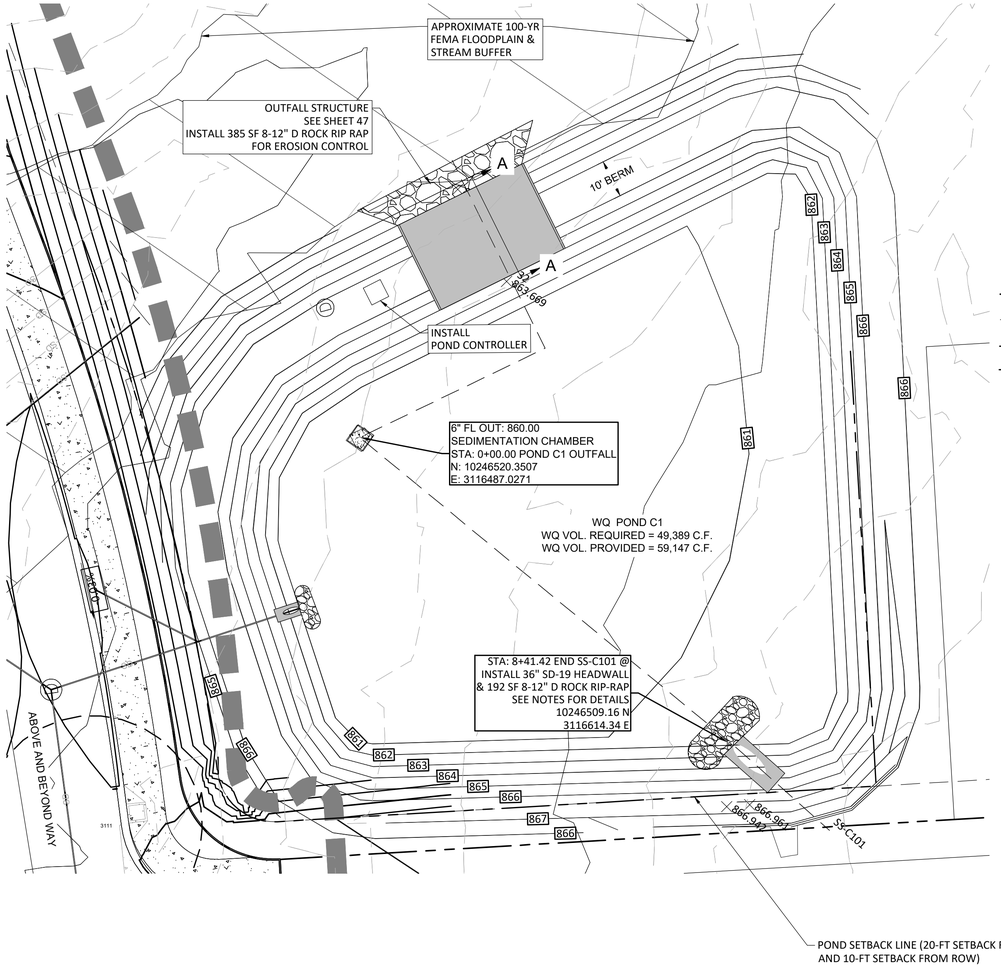
OVERALL STORMSEWER PLAN (2 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 33 of 93

2023-19-CON



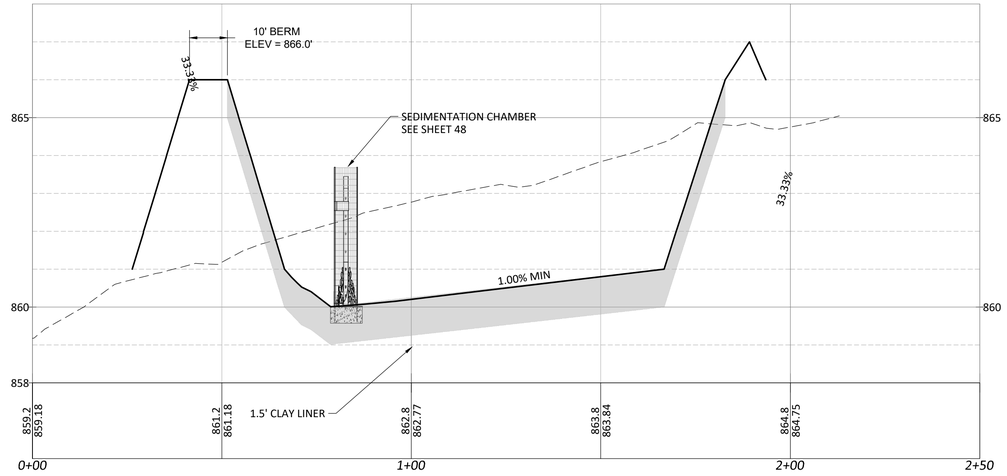
0 20 40 Feet

SCALE: 1" = 20'

LEGEND

- STORM MANHOLE
- STORM JUNCTION BOX
- WASTEWATER MANHOLE
- CURB INLET
- AREA INLET
- PROPOSED PROFILE
- EXISTING GRADE AT PROPOSED CENTERLINE
- HYDRAULIC GRADE LINE (100YR)
- HYDRAULIC GRADE LINE (25 YR)

POND C1 X-SECTION



POND C1 VOLUME			
Stage (ft)	Contour Area (sf)	Area Volume	Cumulative Volume (cf)
860	25	0	0
861	12,290	6,158	6,158
862	17,460	14,875	21,033
863	19,043	18,252	39,284
864	20,683	19,863	59,147
865	22,379	21,531	80,678
866	24,131	23,255	103,932
WQ Volume Required:			49,389

100 YEAR DEV CFS	EMERGENCY OVERFLOW WEIR CALCULATIONS WQ POND C1		
106	Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
Maximum WSE (ft)	860	0	0
864	861	0.14	0
Weir Elevation (ft)	862	0.48	0
864	863	0.9	0
Weir Length (ft)	864	1.36	0
36	865	1.85	108
	866	2.39	305
	100 YEAR CFS TO POND C1		106.00

Construction Phase - Temporary Sediment Basin C			
Elevation [ft]	Area [s.f.]	Avg End Incremental Volume [c.f.]	Avg End Cumulative Volume [c.f.]
860	25	0	0.00
861	12290.01	6158	6,157.51
862	17460.2	14875	21,032.61
863	19043.1	18252	39,284.26
864	20682.54	19863	59,147.08
866	24131	44814	103,960.62
3,000 Ft³/Ac		Required =	29,465.27

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **Pond C1**

Total drainage basin/outfall area =	**9.82**	acres	
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres	
Post-development impervious area within drainage basin/outfall area =	**6.32**	acres	
Post-development impervious fraction within drainage basin/outfall area =	**0.64**		
$L_{M\ THIS\ BASIN}$ =	**5501**	lbs.	**5845** AT 85% REMOVAL

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Batch Detention Basin**
Removal efficiency = **91** percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**9.82**	acres	
A_I =	**6.32**	acres	
A_P =	**3.50**	acres	
L_R =	**6423**	lbs	**6423** AT 85% REMOVAL

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = **5501** lbs. **5845** AT 85% REMOVAL

F = **0.86**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth = **1.38** inches
Post Development Runoff Coefficient = **0.45**
On-site Water Quality Volume = **22340** cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP = **0.00** acres
Off-site Impervious cover draining to BMP = **0.00** acres
Impervious fraction of off-site area = **0**
Off-site Runoff Coefficient = **0.00**
Off-site Water Quality Volume = **0** cubic feet

Storage for Sediment = **4468** **5828** AT 85% REMOVAL
Total Capture Volume (required water quality volume(s) x 1.20) = **26808** cubic feet **34967** AT 85% REMOVAL

WARNING!
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NO.	REVISION	BY	DATE

SJT — DESIGNED BY: — 8-10-2022 DATE
BLM, SJT — DRAWN BY: — 8-16-2022 DATE
SJT — CHECKED BY: — 8-19-2022 DATE
BEM — APPROVED BY: — 8-22-2022 DATE

STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED PROFESSIONAL ENGINEER
08/24/2023

STEGER BIZZELL
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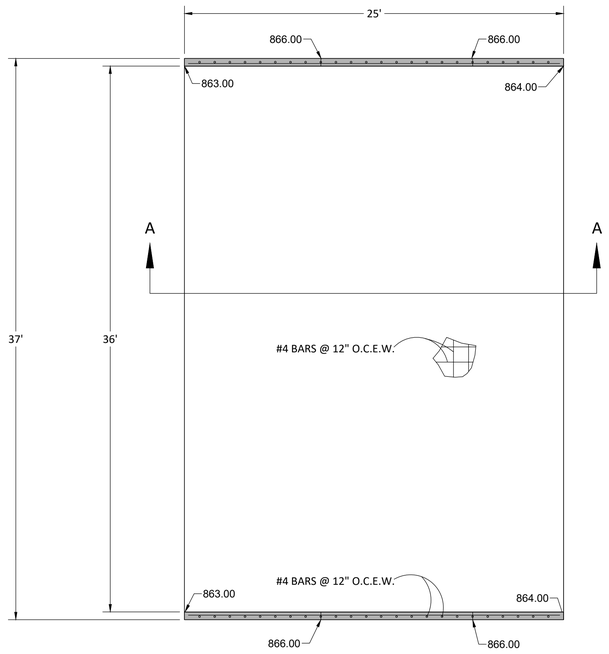
WATER QUALITY & DETENTION POND C1 PLAN
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

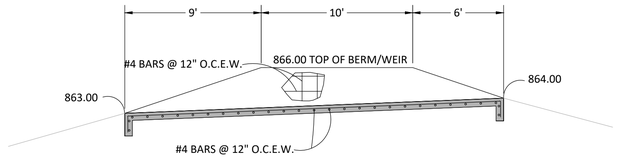
Project No: 22226-21

SHEET 47 of 93

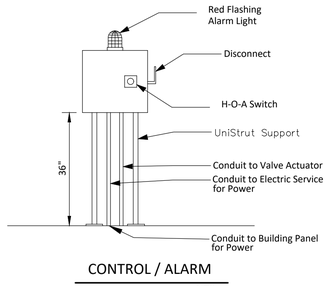
2023-19-CON



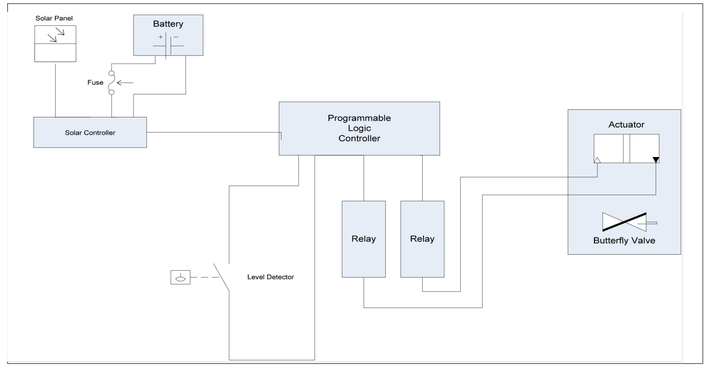
POND C1 OUTFALL STRUCTURE PLAN
SCALE: 1" = 5'



POND C1 OUTFALL STRUCTURE SECTION A-A
SCALE: 1" = 5'



CONTROL / ALARM
NTS



CONTROLLER CIRCUIT BOX DIAGRAM

NTS

6" OUTFALL PIPE DRAWDOWN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	**0.00**	**59,147**	**864.00**	**1.95**
2.00	0.00	45,684	863.33	1.79
4.00	0.00	33,405	862.69	1.62
6.00	0.00	22,375	862.08	1.44
8.00	0.00	12,683	861.48	1.24
10.00	0.00	4,573	860.86	1.00
12.00	0.00	0	860.00	0.00
14.00	0.00	0	860.00	0.00
16.00	0.00	0	860.00	0.00
18.00	0.00	0	860.00	0.00
20.00	0.00	0	860.00	0.00
22.00	0.00	0	860.00	0.00
24.00	0.00	0	860.00	0.00
26.00	0.00	0	860.00	0.00
28.00	0.00	0	860.00	0.00
30.00	0.00	0	860.00	0.00
32.00	0.00	0	860.00	0.00
34.00	0.00	0	860.00	0.00
36.00	0.00	0	860.00	0.00
38.00	0.00	0	860.00	0.00
40.00	0.00	0	860.00	0.00
42.00	0.00	0	860.00	0.00
44.00	0.00	0	860.00	0.00
46.00	0.00	0	860.00	0.00
48.00	0.00	0	860.00	0.00

LINER DATA

IMPERMEABLE LINERS MAY BE CLAY, CONCRETE OR GEOMEMBRANE.

CLAY LINERS SHOULD MEET THE SPECIFICATIONS AS SHOWN BELOW AND HAVE A MINIMUM THICKNESS OF 12 INCHES.

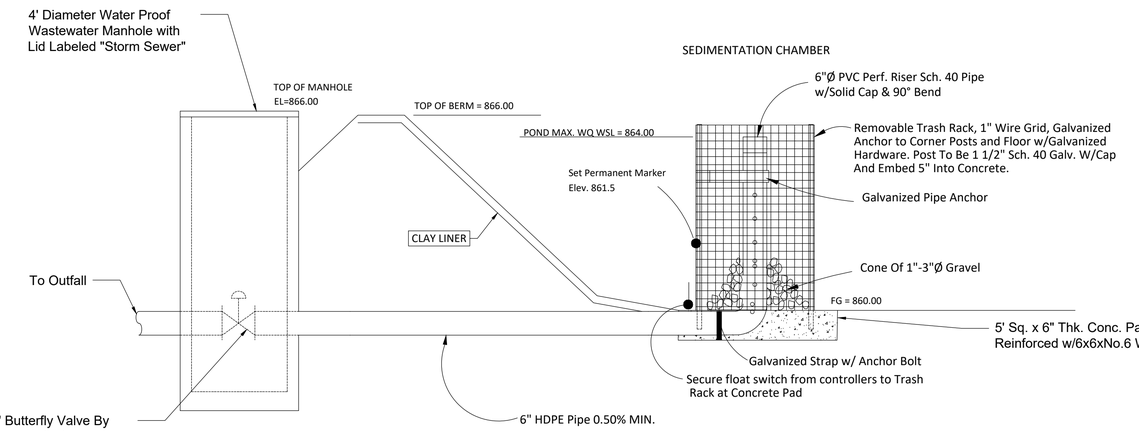
CLAY LINER SPECIFICATIONS (MIN. THICKNESS = 12")			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
PERMEABILITY	ASTM D-2434	Cm/Sec	$1X10^{(-6)}$
PLASTICITY INDEX OF CLAY	ASTM D-423 & D-424	%	NOT LESS THAN 15
LIQUID LIMIT OF CLAY	ASTM D-2216	%	NOT LESS THAN 30
CLAY PARTICLES PASSING	ASTM D-422	%	NOT LESS THAN 30
CLAY COMPACTION	ASTM D-2216	%	95% OF STANDARD PROCTOR DENSITY AT OR ABOVE OPTIMUM MOISTURE CONTENT

GEOSYNTHETIC CLAY LINERS (GCLS) ARE FACTORY MANUFACTURED HYDRAULIC BARRIERS TYPICALLY CONSISTING OF BENTONITE CLAY OR OTHER VERY LOW PERMEABILITY MATERIAL, SUPPORTED BY GEOTEXTILES AND/OR GEOMEMBRANES WHICH ARE HELD TOGETHER BY NEEDLING, STITCHING, OR CHEMICAL ADHESIVES. THESE LINERS MUST HAVE A HYDRAULIC CONDUCTIVITY OF LESS THAN 5 X 10-9 CM/SEC, WHEN TESTED BY ASTM D5887. A MINIMUM OF 12 INCHES OF SOIL COVER IS RECOMMENDED. IF A GEOMEMBRANE LINER IS USED IT SHOULD HAVE A MINIMUM THICKNESS OF 30 MILS AND BE ULTRAVIOLET RESISTANT. SUITABLE GEOTEXTILE FABRIC SHOULD BE PLACED ON THE TOP AND BOTTOM OF THE MEMBRANE FOR PUNCTURE PROTECTION AND THE LINERS COVERED WITH A MINIMUM OF 6 INCHES OF COMPACTED TOPSOIL. THE GEOTEXTILE FABRIC (FOR PROTECTION OF GEOMEMBRANE) SHOULD BE NONWOVEN GEOTEXTILE FABRIC AND MEET THE SPECIFICATIONS IN TABLE 3-7. THE TOPSOIL SHOULD BE STABILIZED WITH APPROPRIATE VEGETATION.

GEOTEXTILE FABRIC DATA			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
MATERIAL	NON-WOVEN GEOTEXTILE FABRIC		
UNIT WEIGHT		OZ./SQ. YD.	8 (MIN.)
FILTRATION RATE		IN./SEC.	0.20 (MIN)
PUNCTURE STRENGTH	ASTM D-751 (MODIFIED)	LB.	125 (MIN)
MULLEN BURST STRENGTH	ASTM D-751	P.S.I.	400 (MIN.)
TENSILE STRENGTH	ASTM D-1682	LB.	200 (MIN.)
EQUIV. OPENING SIZE	U.S. STANDARD SIEVE	NO.	80 (MIN.)

BATCH POND CONTROLLER NOTES:

1. Submittals - The contractor shall provide the engineer with batch pond controller submittals for review and approval prior to construction. Submittals shall include: power source, battery backup, logic controller, lockable parts enclosure, float, valve, actuator, relay, alarm system, signage, etc. Total wattage of power consumption and w-hours of actuator, controller and relay shall be provided. A copy of the approved submittals shall be provided to TCEQ with the engineers certification of project completion for inclusion in the TCEQ project file .
2. Controller - The controller consists of a level sensor in the detention basin, a valve (with a default closed position), an actuator, and the associated control. The controller detects water filling the basin from the level sensor and initiates a 12-hour detention time. At the end of the required detention time, the controller opens the valve and drains into the second basin. Subsequent rainfall events that occur prior to the basin draining should cause the valve to remain open and allow the additional stormwater runoff to pass through the basin. Once the basin is drained the controller closes the valve. The drawdown time of the basin should not exceed 48 hours for a single storm event after the 12 hour required detention time. All cables should be protected by conduit and buried to prevent damage during maintenance activities. Information on the design and configuration of an existing system, including the system schematic, can be viewed at the Austin or San Antonio Regional Offices.
3. Logic Controller – The controller should be programmed to begin draining stormwater runoff from the basin 12 hours after the first stormwater runoff is sensed. The system should be programmed to have the valve remain open for two hours after the level sensor indicates the basin is empty to allow any remaining shallow water to be discharged. The system should provide the following: a test sequence, be able to deal with low battery/power outages, an on/off/reset switch, manual open/close switches (maintenance/spill), clearly visible external indicator to indicate a cycle is in progress without opening the box, and ability to exercise the valve to prevent seizing
4. Power – The pond control system controller and actuator shall be 120 volt powered or 120 volt solar powered with backup battery power to respond to a loss of power in the middle of a cycle.
5. Parts Enclosure & Alarm System - The parts enclosure shall be lockable. An alarm system clearly visible to indicate system malfunction, with phone numbers of the owner and TCEQ Region 11 office shall be provided.
6. Temperature/Weather - The system shall be be capable of operation from 0 to 130 degrees Fahrenheit and from 10 to 90% humidity.
7. Reliability - The system shall have a minimum reliability of 40,000 hours (4.6 years).



Perforated Riser Pipes

Riser Pipe Ø	Vert. Spacing Between Rows O.C.	No. Perforations Per Row	Diameter of Perforations
6"	2.5"	4	1"

SEDIMENTATION RISER PIPE

NTS

Broad Crested Weir Flows

Q = Cw*L*(h)^1.5 (Standard Equaton)
Cw - Weir Coefficient
Q = capacity, in CFS
L = length of weir, in Feet
h = head, in Ft.

POND C-1

Cw=	2.63	Range is 2.6-3.1
Q100 =	106	CFS
L =	36	FT
h =	1.078198	FT

POND C-1 WSEL100 = 865.08 Ft. (MSL)

POND C-1 FREEBOARD = 0.92 Ft. (MSL)

REQUIRED POND C-1 FREEBOARD = 0.5 Ft.

EQUATION 5-8, DISCHARGE OVER A WEIR[3]

$Q = C_w L H^{1.5}$

Q - weir flow rate (cfs)
C_w - Weir Coefficient
L - horizontal length of weir crest (ft)
H - head above weir crest elevation (ft)

The value of the weir coefficient is dependent on many parameters, but to standardize design, a value of 3.0 should be used in Equation 5-8 for sharp-crested rectangular weirs unless the use of a different value is justified. See Brater and King[3] for more discussion.

Spillways constructed in earthen embankments should use Equation 5-8 with Table 5-5 values unless the use of a different value is justified.

TABLE 5-5, BROAD CRESTED WEIR COEFFICIENT[3]

Description	C_w
1 ft. Wide	3.00
5 ft. Wide	2.70
15 ft. Wide	2.60

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

NO.	REVISION	BY	DATE

SJT — DESIGNED BY — 8-10-2022 DATE
BLM, SJT — DRAWN BY — 8-16-2022 DATE
SJT — CHECKED BY — 8-19-2022 DATE
BEM — APPROVED BY — 8-22-2022 DATE

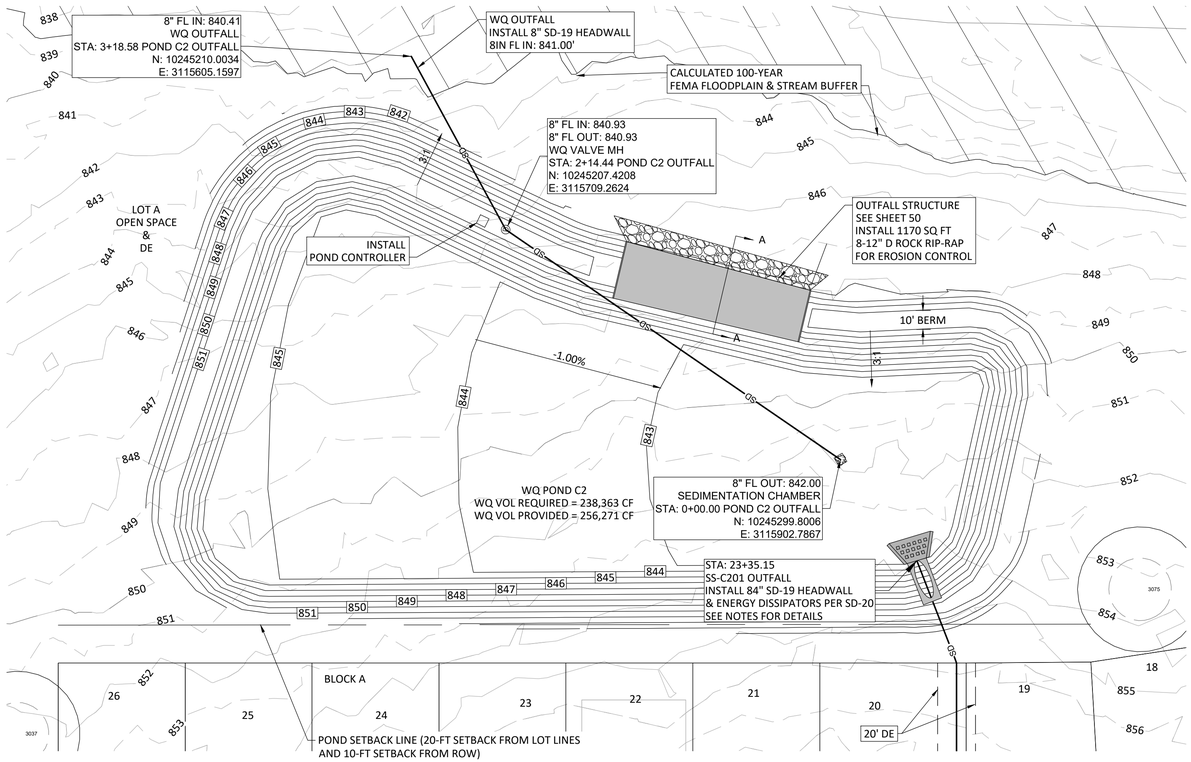
STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED PROFESSIONAL ENGINEER · 08/24/2023

STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

WATER QUALITY AND DETENTION POND C1 DETAILS
for
WOODSIDE EAST - PHASE A
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 48 of 120



POND C2 VOLUME			
Stage (ft)	Contour Area (sf)	Area Volume (cf)	Avg End Area Cumulative Volume (cf)
842	25	0	0
843	16,976	8,501	8,501
844	32,319	24,647	33,148
845	52,717	42,518	75,666
846	59,080	55,899	131,565
847	62,339	60,710	192,274
848	65,655	63,997	256,271
849	69,026	67,341	323,612
850	72,454	70,740	394,352
851	75,940	74,197	468,549
WQ Volume Required:			131,279

100 YEAR DEV CFS	EMERGENCY OVERFLOW WEIR CALCULATIONS WQ POND C2		
399.35	Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
Maximum WSE (ft)	842	0	0
849.33	843	0.2	0
Weir Elevation (ft)	844	0.76	0
848	845	1.74	0
Weir Length (ft)	846	3.02	0
100	847	4.41	0
	848	5.88	0
	849	7.43	300
	850	9.05	849
	851	10.76	1559
	100 YEAR CFS TO POND C2		399.35

Construction Phase - Temporary Sediment Basin C2			
Elevation [ft]	Area [s.f.]	Avg End Incremental Volume [c.f.]	Avg End Cumulative Volume [c.f.]
842	25	0	0.00
843	16976	8501	8,500.50
844	32318.6268	24647	33,147.81
845	52717.28	42518	75,665.77
846	59080.36	55899	131,564.59
847	62339.18	60710	192,274.36
848	65654.57	63997	256,271.23
849	69026.49	67341	323,611.76
850	72454	70740	394,352.01
851	75939.98	74197	468,549.00
3,000 Ft³/Ac		Required =	141,985.97

NOTES:
1. THE ENERGY DISSIPATERS OF SS-C201 OUTFALL SHALL FOLLOW THE STANDARD DETAIL SD-20 WITH THE FOLLOWING DIMENSIONS:
   - H = 1.5' (18")
   - A = 2.7' (32.5")
   - B = 3.05' (36.6")
2. ALL VOLUMES WERE CALCULATED USING THE AVERAGE END AREA METHOD
3. A WEIR COEFFICIENT OF 3.0 REPRESENTATIVE OF SHARP CRESTED WEIRS WAS USED IN ALL CALCULATIONS.

LINER DATA

IMPERMEABLE LINERS MAY BE CLAY, CONCRETE OR GEOMEMBRANE.

CLAY LINERS SHOULD MEET THE SPECIFICATIONS AS SHOWN BELOW AND HAVE A MINIMUM THICKNESS OF 12 INCHES.

CLAY LINER SPECIFICATIONS (MIN. THICKNESS = 12")			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
PERMEABILITY	ASTM D-2434	Cm/Sec	$1X10^{(-4)}$
PLASTICITY INDEX OF CLAY	ASTM D-423 & D-424	%	NOT LESS THAN 15
LIQUID LIMIT OF CLAY	ASTM D-2216	%	NOT LESS THAN 30
CLAY PARTICLES PASSING	ASTM D-422	%	NOT LESS THAN 30
CLAY COMPACTION	ASTM D-2216	%	95% OF STANDARD PROCTOR DENSITY AT OR ABOVE OPTIMUM MOISTURE CONTENT

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GEOTEXTILE FABRIC DATA			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
MATERIAL	NON−WOVEN GEOTEXTILE FABRIC		
UNIT WEIGHT		OZ./SQ. YD.	8 (MIN.)
FILTRATION RATE		IN./SEC.	0.20 (MIN)
PUNCTURE STRENGTH	ASTM D-751 (MODIFIED)	LB.	125 (MIN)
MULLEN BURST STRENGTH	ASTM D-751	P.S.I.	400 (MIN.)
TENSILE STRENGTH	ASTM D-1682	LB.	200 (MIN.)
EQUIV. OPENING SIZE	U.S. STANDARD SIEVE	NO.	80 (MIN.)

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. =	C2			
Total drainage basin/outfall area =	41.70	acres		
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres		
Post-development impervious area within drainage basin/outfall area =	23.88	acres		
Post-development impervious fraction within drainage basin/outfall area =	0.57			
$L_{M\ THIS\ BASIN}$ =	20785	lbs.	22084	AT 85% REMOVAL

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Batch Detention Basin	
Removal efficiency =	91	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

A_C =	Total On-Site drainage area in the BMP catchment area		
A_I =	Impervious area proposed in the BMP catchment area		
A_P =	Pervious area remaining in the BMP catchment area		
L_R =	TSS Load removed from this catchment area by the proposed BMP		
A_C =	41.70	acres	
A_I =	23.88	acres	
A_P =	17.82	acres	
L_R =	24341	lbs	24341 AT 85% REMOVAL

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

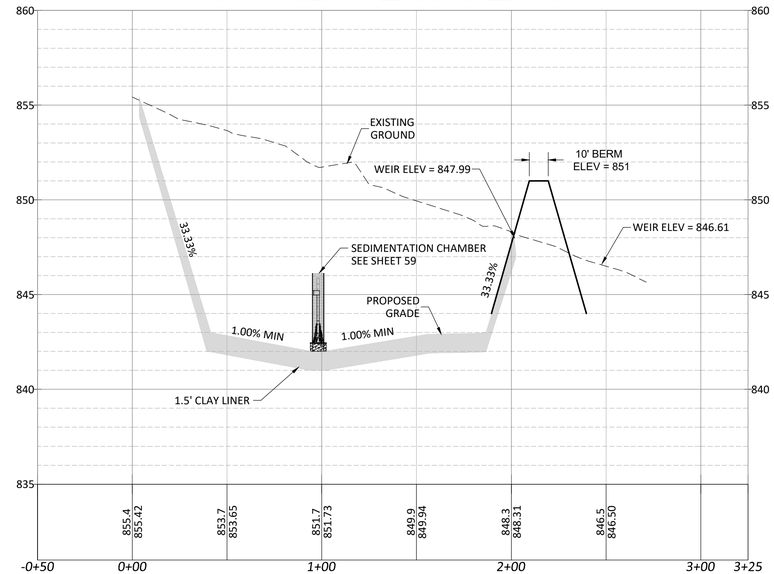
Desired $L_{M\ THIS\ BASIN}$ =	20785	lbs.	22084 AT 85% REMOVAL
F =	0.85		

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.32	inches	
Post Development Runoff Coefficient =	0.40		
On-site Water Quality Volume =	80193	cubic feet	
	Calculations from RG-348	Pages 3-36 to 3-37	
Off-site area draining to BMP =	0.35	acres	
Off-site Impervious cover draining to BMP =	0.00	acres	
Impervious fraction of off-site area =	0.00		
Off-site Runoff Coefficient =	0.02		
Off-site Water Quality Volume =	34	cubic feet	
Storage for Sediment =	16045		21880 AT 85% REMOVAL
Total Capture Volume (required water quality volume(s) x 1.20) =	96271	cubic feet	131279 AT 85% REMOVAL

0 40 80 Feet
SCALE: 1" = 40'

POND C2 X-SECT



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SJT — DESIGNED BY: — 8-10-2022 DATE
BLM, SJT — DRAWN BY: — 8-16-2022 DATE
SJT — CHECKED BY: — 8-19-2022 DATE
BEM — APPROVED BY: — 8-22-2022 DATE

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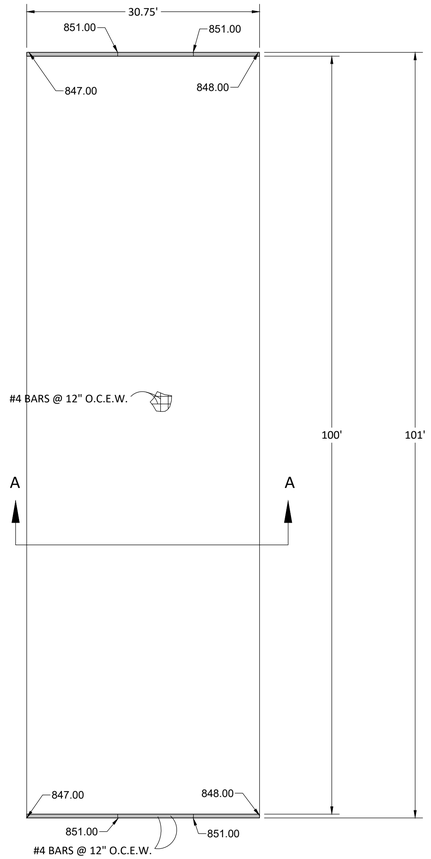
WATER QUALITY POND C2 PLAN
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

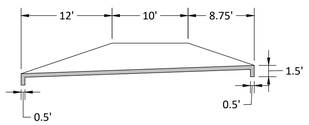
SHEET 49 of 93

2023-19-CON



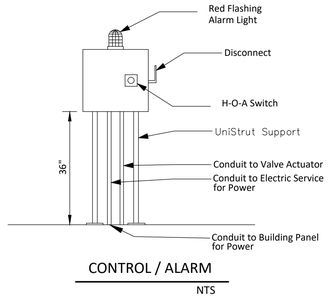
POND C2 OUTFALL STRUCTURE PLAN

SCALE: 1" = 10'



POND C2 OUTFALL STRUCTURE SECTION A-A

SCALE: 1" = 10'



CONTROL / ALARM

NTS

Broad Crested Weir Flows

Q = Cw*L*(h)^1.5 (Standard Equaton)
Cw - Weir Coefficient
Q = capacity, in CFS
L = length of grate, in Feet
h = head, in Ft.

POND C-2

Cw=	2.6	Range is 2.6-3.1
Q100 =	399.35	CFS
L =	100	FT
h =	1.331231	FT

POND C-3

Cw =	2.6	Range is 2.6-3.1
Q100=	298	CFS
L =	50	FT
h =	1.738529	FT

POND C-2 WSEL100 =	849.33	Ft. (MSL)
POND C-3 WSEL100 =	841.99	Ft. (MSL)
POND C-2 FREEBOARD =	1.67	Ft. (MSL)
POND C-3 FREEBOARD =	1.01	Ft. (MSL)
REQUIRED POND C-2 FREEBOARD =	1.0	Ft.
REQUIRED POND C-3 FREEBOARD =	1.0	Ft.

EQUATION 5-8, DISCHARGE OVER A WEIR[3]

$$Q = C_w L H^{1.5}$$

Q - weir flow rate (cfs)
C_w - Weir Coefficient
L - horizontal length of weir crest (ft)
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The value of the weir coefficient is dependent on many parameters, but to standardize design, a value of 3.0 should be used in Equation 5-8 for sharp-crested rectangular weirs unless the use of a different value is justified. See Brater and King[3] for more discussion.

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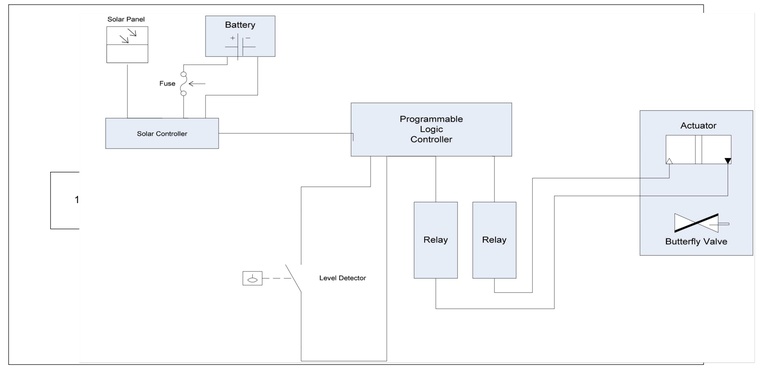

CONTROLLER CIRCUIT BOX DIAGRAM

NTS

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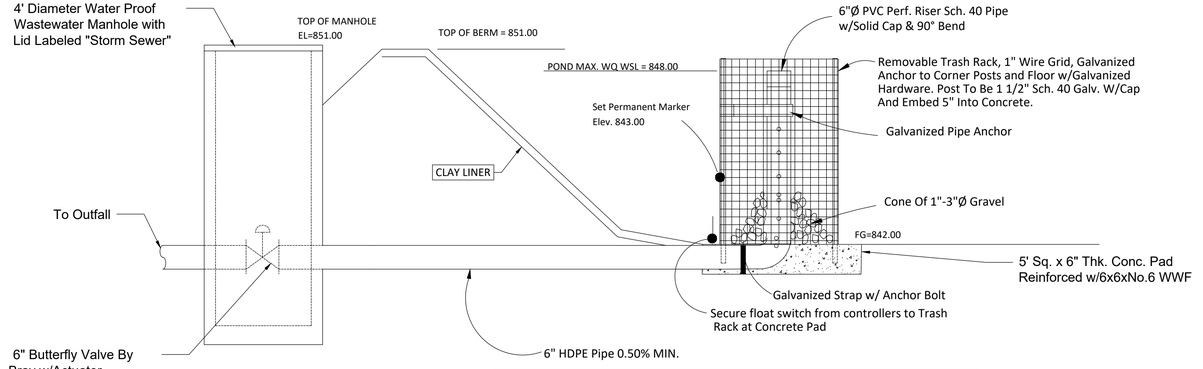
6. Temperature/Weather - The system shall be be capable of operation from 0 to 130 degrees Fahrenheit and from 10 to 90% humidity.
7. Reliability - The system shall have a minimum reliability of 40,000 hours (4.6 years).

6" OUTFALL PIPE DRAWDOWN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	**0.00**	**256,271**	**848.00**	**2.36**
2.00	0.00	239,431	847.74	2.31
4.00	0.00	222,948	847.49	2.26
6.00	0.00	206,828	847.23	2.21
8.00	0.00	191,074	846.98	2.16
10.00	0.00	175,693	846.73	2.11
12.00	0.00	160,689	846.49	2.06
14.00	0.00	146,067	846.24	2.00
16.00	0.00	131,831	846.00	1.95
18.00	0.00	117,988	845.77	1.89
20.00	0.00	104,548	845.53	1.84
22.00	0.00	91,521	845.30	1.78
24.00	0.00	78,918	845.06	1.72
26.00	0.00	66,754	844.82	1.66
28.00	0.00	55,062	844.57	1.59
30.00	0.00	43,899	844.30	1.51
32.00	0.00	33,340	844.01	1.42
34.00	0.00	23,494	843.68	1.31
36.00	0.00	14,502	843.31	1.18
38.00	0.00	6,596	842.88	1.00
40.00	0.00	391	842.21	0.64
42.00	0.00	0	842.00	0.00
44.00	0.00	0	842.00	0.00
46.00	0.00	0	842.00	0.00
48.00	0.00	0	842.00	0.00

SEDIMENTATION CHAMBER



Perforated Riser Pipes

Riser Pipe Ø	Vert. Spacing Between Rows O.C.	No. Perforations Per Row	Diameter of Perforations
6"	2.5"	4	1"

SEDIMENTATION RISER PIPE

NTS

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BEM	APPROVED BY:	8-22-2022 DATE

STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED PROFESSIONAL ENGINEER
08/24/2023

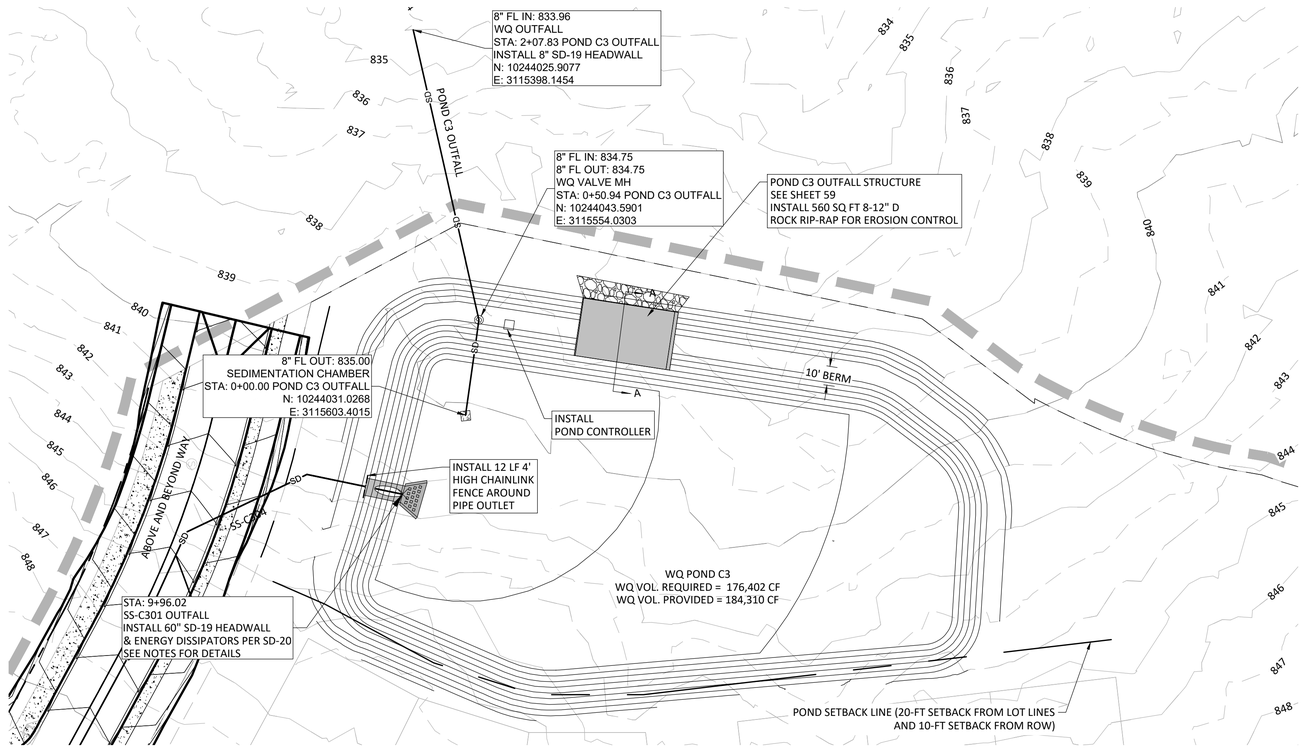
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

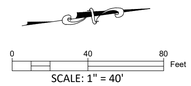
WATER QUALITY POND C2 PLAN
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 50 of 93

2023-19-CON





2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. =	**C3**			
Total drainage basin/outfall area =	**28.46**	acres		
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres		
Post-development impervious area within drainage basin/outfall area =	**15.37**	acres		
Post-development impervious fraction within drainage basin/outfall area =	**0.54**			
$L_{M\ THIS\ BASIN}$ =	**13378**	lbs.	**14214**	AT 85% REMOVAL

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Batch Detention Basin**
Removal efficiency = **91** percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**28.42**	acres		
A_I =	**15.07**	acres		
A_P =	**13.35**	acres		
L_R =	**15394**	lbs	**15394**	AT 85% REMOVAL

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**13378**	lbs.	**14214**	AT 85% REMOVAL
F =	**0.87**			

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.44**	inches		
Post Development Runoff Coefficient =	**0.37**			
On-site Water Quality Volume =	**55672**	cubic feet		

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.04**	acres		
Off-site Impervious cover draining to BMP =	**0.00**	acres		
Impervious fraction of off-site area =	**0.00**			
Off-site Runoff Coefficient =	**0.02**			
Off-site Water Quality Volume =	**4**	cubic feet		
Storage for Sediment =	**11135**		**15466**	AT 85% REMOVAL
Total Capture Volume (required water quality volume(s) x 1.20) =	**66811**	cubic feet	**92793**	AT 85% REMOVAL

POND C3 VOLUME			
Stage (ft)	Contour Area (sf)	Area Volume	Cumulative Volume (cf)
835	25	0	0
836	21,522	10,774	10,774
837	39,911	30,717	41,490
838	42,368	41,139	82,630
839	44,881	43,624	126,254
840	47,451	46,166	172,420
840.25	47,668	11,890	184,310
841	50,078	48,399	220,819
842	52,761	51,419	272,238
843	55,500	54,130	326,368
WQ Volume Required:			176,402

100 YEAR DEV CFS	EMERGENCY OVERFLOW WEIR CALCULATIONS WQ POND C3		
298	Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
Maximum WSE (ft)	836	0.25	0
840.25	837	0.95	0
Weir Elevation (ft)	838	1.9	0
840.25	839	2.9	0
Weir Length (ft)	840	3.96	0
50	840.25	4.23	0
	841	5.07	97
	842	6.25	347
	843	7.5	684
	100 YEAR CFS TO POND B		298.00

Construction Phase - Temporary Sediment Basin C			
Elevation [ft]	Area [s.f.]	Avg End Incremental Volume [c.f.]	Avg End Cumulative Volume [c.f.]
836	21522	0	0
837	39911	30717	30717
838	42368	41139	71856
839	44881	43624	115480
840	47451	46166	161646
842	52761	100212	261858
843	55500	54130	315988
3,000 Ft²/Ac		Required =	104418

NOTES:
1. THE ENERGY DISSIPATERS OF SS-C301 OUTFALL SHALL FOLLOW THE STANDARD DETAIL SD-20 WITH THE FOLLOWING DIMENSIONS:
   - H = 1.25' (15")
   - A = 2.25' (27")
   - B = 2.54' (30.5")
2. ALL VOLUMES WERE CALCULATED USING THE AVERAGE END AREA METHOD
3. A WEIR COEFFICIENT OF 3.0 REPRESENTATIVE OF SHARP CRESTED WEIRS WAS USED IN ALL CALCULATIONS.

LINER DATA

IMPERMEABLE LINERS MAY BE CLAY, CONCRETE OR GEOMEMBRANE.

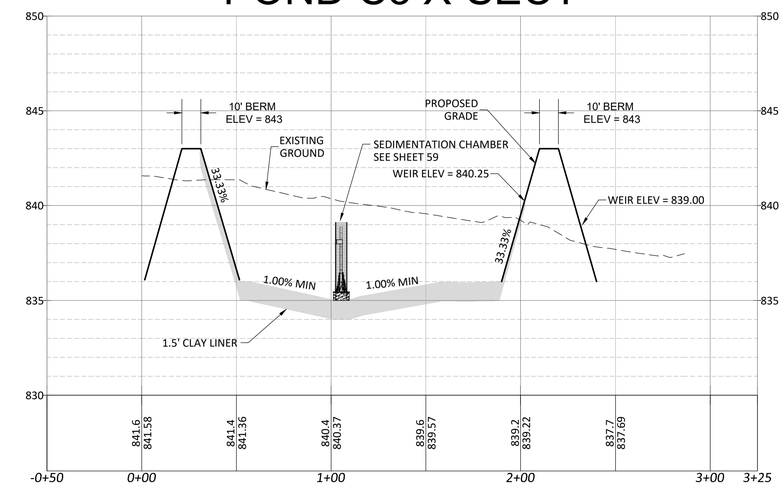
CLAY LINERS SHOULD MEET THE SPECIFICATIONS AS SHOWN BELOW AND HAVE A MINIMUM THICKNESS OF 12 INCHES.

CLAY LINER SPECIFICATIONS (MIN. THICKNESS = 12")			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
PERMEABILITY	ASTM D-2434	Cm/Sec	$1X10^{(-6)}$
PLASTICITY INDEX OF CLAY	ASTM D-423 & D-424	%	NOT LESS THAN 15
LIQUID LIMIT OF CLAY	ASTM D-2216	%	NOT LESS THAN 30
CLAY PARTICLES PASSING	ASTM D-422	%	NOT LESS THAN 30
CLAY COMPACTION	ASTM D-2216	%	95% OF STANDARD PROCTOR DENSITY AT OR ABOVE OPTIMUM MOISTURE CONTENT

GEOSYNTHETIC CLAY LINERS (GCLS) ARE FACTORY MANUFACTURED HYDRAULIC BARRIERS TYPICALLY CONSISTING OF BENTONITE CLAY OR OTHER VERY LOW PERMEABILITY MATERIAL, SUPPORTED BY GEOTEXTILES AND/OR GEOMEMBRANES WHICH ARE HELD TOGETHER BY NEEDLING, STITCHING, OR CHEMICAL ADHESIVES. THESE LINERS MUST HAVE A HYDRAULIC CONDUCTIVITY OF LESS THAN 5 X 10−9 CM/SEC, WHEN TESTED BY ASTM D5887. A MINIMUM OF 12 INCHES OF SOIL COVER IS RECOMMENDED. IF A GEOMEMBRANE LINER IS USED IT SHOULD HAVE A MINIMUM THICKNESS OF 30 MILS AND BE ULTRAVIOLET RESISTANT. SUITABLE GEOTEXTILE FABRIC SHOULD BE PLACED ON THE TOP AND BOTTOM OF THE MEMBRANE FOR PUNCTURE PROTECTION AND THE LINERS COVERED WITH A MINIMUM OF 6 INCHES OF COMPACTED TOPSOIL. THE GEOTEXTILE FABRIC (FOR PROTECTION OF GEOMEMBRANE) SHOULD BE NONWOVEN GEOTEXTILE FABRIC AND MEET THE SPECIFICATIONS IN TABLE 3−7. THE TOPSOIL SHOULD BE STABILIZED WITH APPROPRIATE VEGETATION.

GEOTEXTILE FABRIC DATA			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
MATERIAL	NON−WOVEN GEOTEXTILE FABRIC		
UNIT WEIGHT		OZ./SQ. YD.	8 (MIN.)
FILTRATION RATE		IN./SEC.	0.20 (MIN)
PUNCTURE STRENGTH	ASTM D−751 (MODIFIED)	LB.	125 (MIN)
MULLEN BURST STRENGTH	ASTM D−751	P.S.I.	400 (MIN.)
TENSILE STRENGTH	ASTM D−1682	LB.	200 (MIN.)
EQUIV. OPENING SIZE	U.S. STANDARD SIEVE	NO.	80 (MIN.)

POND C3 X-SECT



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WATER QUALITY POND C3 PLAN
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Project No: 22226-21

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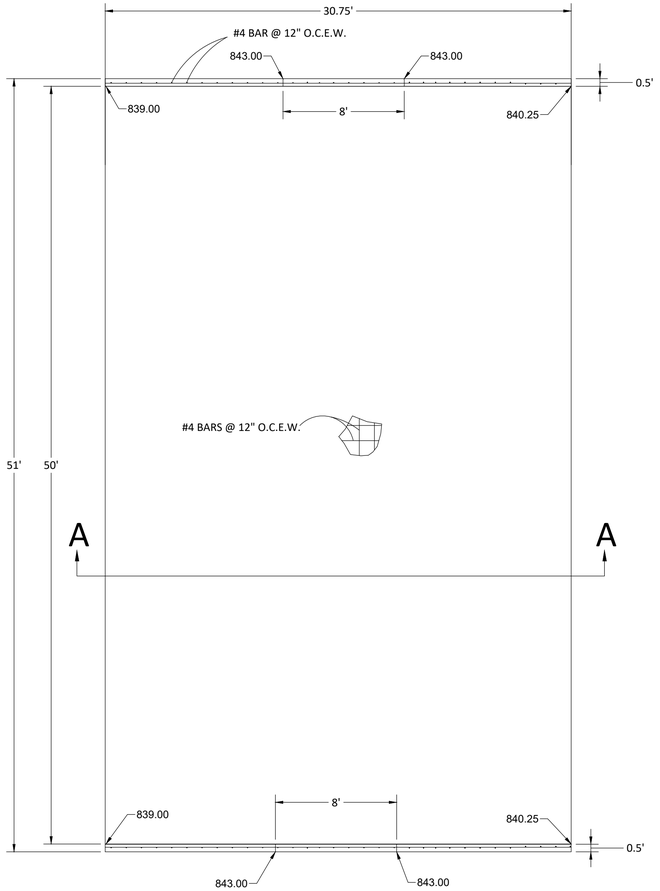
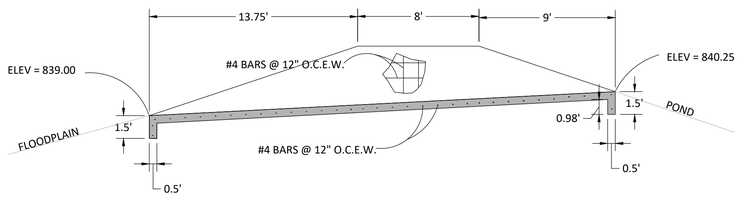
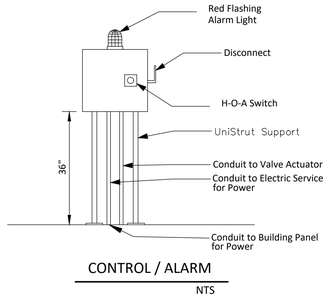


POND C3 OUTFALL STRUCTURE PLAN
SCALE: 1" = 5'



POND C3 OUTFALL STRUCTURE
SECTION A-A
SCALE: 1" = 5'



CONTROL / ALARM
NTS

Broad Crested Weir Flows

Q = Cw*L*(h)^1.5 (Standard Equaton)
Cw - Weir Coefficient
Q = capacity, in CFS
L = length of grate, in Feet
h = head, in Ft.

POND C-2

Cw=	2.6		Range is 2.6-3.1
Q100 =	399.35	CFS	
L =	100	FT	
h =	1.331231	FT	

POND C-3

Cw =	2.6		Range is 2.6-3.1
Q100=	298	CFS	
L =	50	FT	
h =	1.738529	FT	

POND C-2 WSEL100 =	849.33 Ft. (MSL)
POND C-3 WSEL100 =	841.99 Ft. (MSL)
POND C-2 FREEBOARD =	1.67 Ft. (MSL)
POND C-3 FREEBOARD =	1.01 Ft. (MSL)
REQUIRED POND C-2 FREEBOARD =	1.0 Ft.
REQUIRED POND C-3 FREEBOARD =	1.0 Ft.

EQUATION 5-8, DISCHARGE OVER A WEIR[3]

$Q = C_w L H^{1.5}$

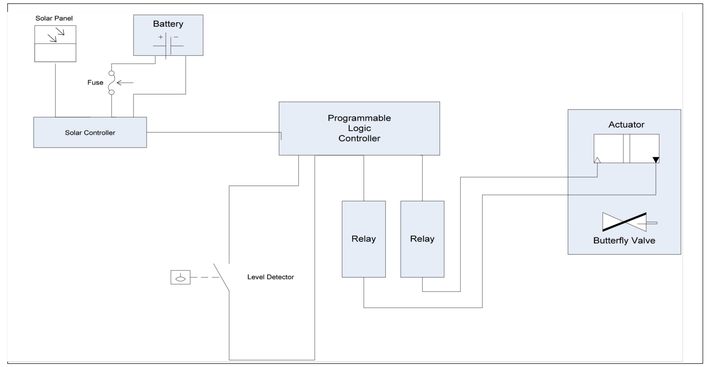
Q = weir flow rate (cfs)
C_w = Weir Coefficient
L = horizontal length of weir crest (ft)
H = head above weir crest elevation (ft)

The value of the weir coefficient is dependent on many parameters, but to standardize design, a value of 3.0 should be used in Equation 5-8 for sharp-crested rectangular weirs unless the use of a different value is justified. See Brater and King[4] for more discussion.

Spillways constructed in earthen embankments should use Equation 5-8 with Table 5-5 values unless the use of a different value is justified.

TABLE 5-5, BROAD CRESTED WEIR COEFFICIENT[3]

Description	C_w
1 ft. Wide	3.00
5 ft. Wide	2.70
15 ft. Wide	2.60



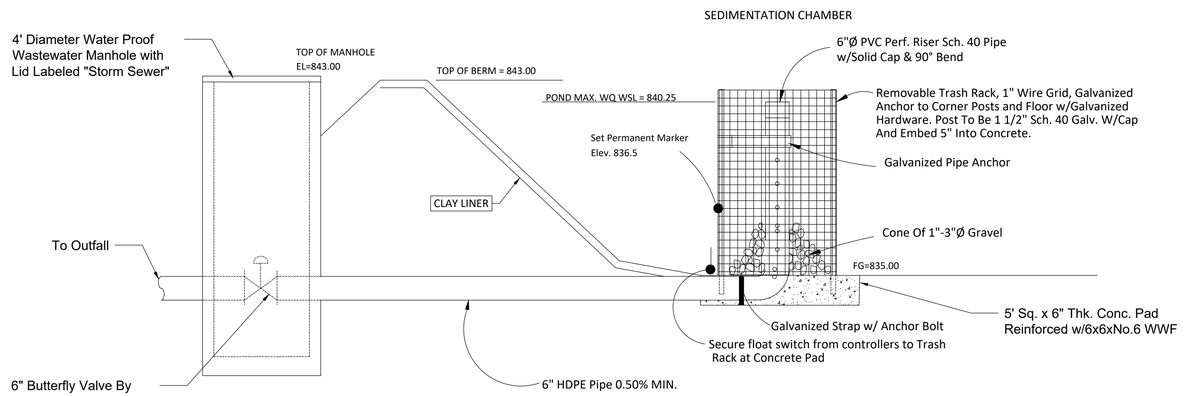
CONTROLLER CIRCUIT BOX DIAGRAM
NTS

BATCH POND CONTROLLER NOTES:

1. Submittals - The contractor shall provide the engineer with batch pond controller submittals for review and approval prior to construction. Submittals shall include: power source, battery backup, logic controller, lockable parts enclosure, float, valve, actuator, relay, alarm system, signage, etc. Total wattage of power consumption and w-hours of actuator, controller and relay shall be provided. A copy of the approved submittals shall be provided to TCEQ with the engineers certification of project completion for inclusion in the TCEQ project file .
2. Controller - The controller consists of a level sensor in the detention basin, a valve (with a default closed position), an actuator, and the associated control. The controller detects water filling the basin from the level sensor and initiates a 12-hour detention time. At the end of the required detention time, the controller opens the valve and drains into the second basin. Subsequent rainfall events that occur prior to the basin draining should cause the valve to remain open and allow the additional stormwater runoff to pass through the basin. Once the basin is drained the controller closes the valve. The drawdown time of the basin should not exceed 48 hours for a single storm event after the 12 hour required detention time. All cables should be protected by conduit and buried to prevent damage during maintenance activities. Information on the design and configuration of an existing system, including the system schematic, can be viewed at the Austin or San Antonio Regional Offices.
3. Logic Controller – The controller should be programmed to begin draining stormwater runoff from the basin 12 hours after the first stormwater runoff is sensed. The system should be programmed to have the valve remain open for two hours after the level sensor indicates the basin is empty to allow any remaining shallow water to be discharged. The system should provide the following: a test sequence, be able to deal with low battery/power outages, an on/off/reset switch, manual open/close switches (maintenance/spill), clearly visible external indicator to indicate a cycle is in progress without opening the box, and ability to exercise the valve to prevent seizing
4. Power – The pond control system controller and actuator shall be 120 volt powered or 120 volt solar powered with backup battery power to respond to a loss of power in the middle of a cycle.
5. Parts Enclosure & Alarm System - The parts enclosure shall be lockable. An alarm system clearly visible to indicate system malfunction, with phone numbers of the owner and TCEQ Region 11 office shall be provided.
6. Temperature/Weather - The system shall be be capable of operation from 0 to 130 degrees Fahrenheit and from 10 to 90% humidity.
7. Reliability - The system shall have a minimum reliability of 40,000 hours (4.6 years).

6" OUTLET PIPE DRAWDOWN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	**0.00**	**184,365**	**840.25**	**2.22**
2.00	0.00	168,643	839.92	2.15
4.00	0.00	153,412	839.59	2.08
6.00	0.00	138,680	839.27	2.01
8.00	0.00	124,457	838.96	1.94
10.00	0.00	110,750	838.65	1.87
12.00	0.00	97,570	838.35	1.79
14.00	0.00	84,926	838.05	1.72
16.00	0.00	72,827	837.77	1.64
18.00	0.00	61,283	837.49	1.56
20.00	0.00	50,302	837.22	1.49
22.00	0.00	39,893	836.96	1.41
24.00	0.00	30,085	836.69	1.32
26.00	0.00	20,955	836.40	1.22
28.00	0.00	12,633	836.08	1.09
30.00	0.00	5,339	835.70	0.92
32.00	0.00	2	835.00	0.01
34.00	0.00	0	835.00	0.00
36.00	0.00	0	835.00	0.00
38.00	0.00	0	835.00	0.00
40.00	0.00	0	835.00	0.00
42.00	0.00	0	835.00	0.00
44.00	0.00	0	835.00	0.00
46.00	0.00	0	835.00	0.00
48.00	0.00	0	835.00	0.00



Perforated Riser Pipes

Riser Pipe Ø	Vert. Spacing Between Rows O.C.	No. Perforations Per Row	Diameter of Perforations
6"	2.5"	4	1"

SEDIMENTATION RISER PIPE
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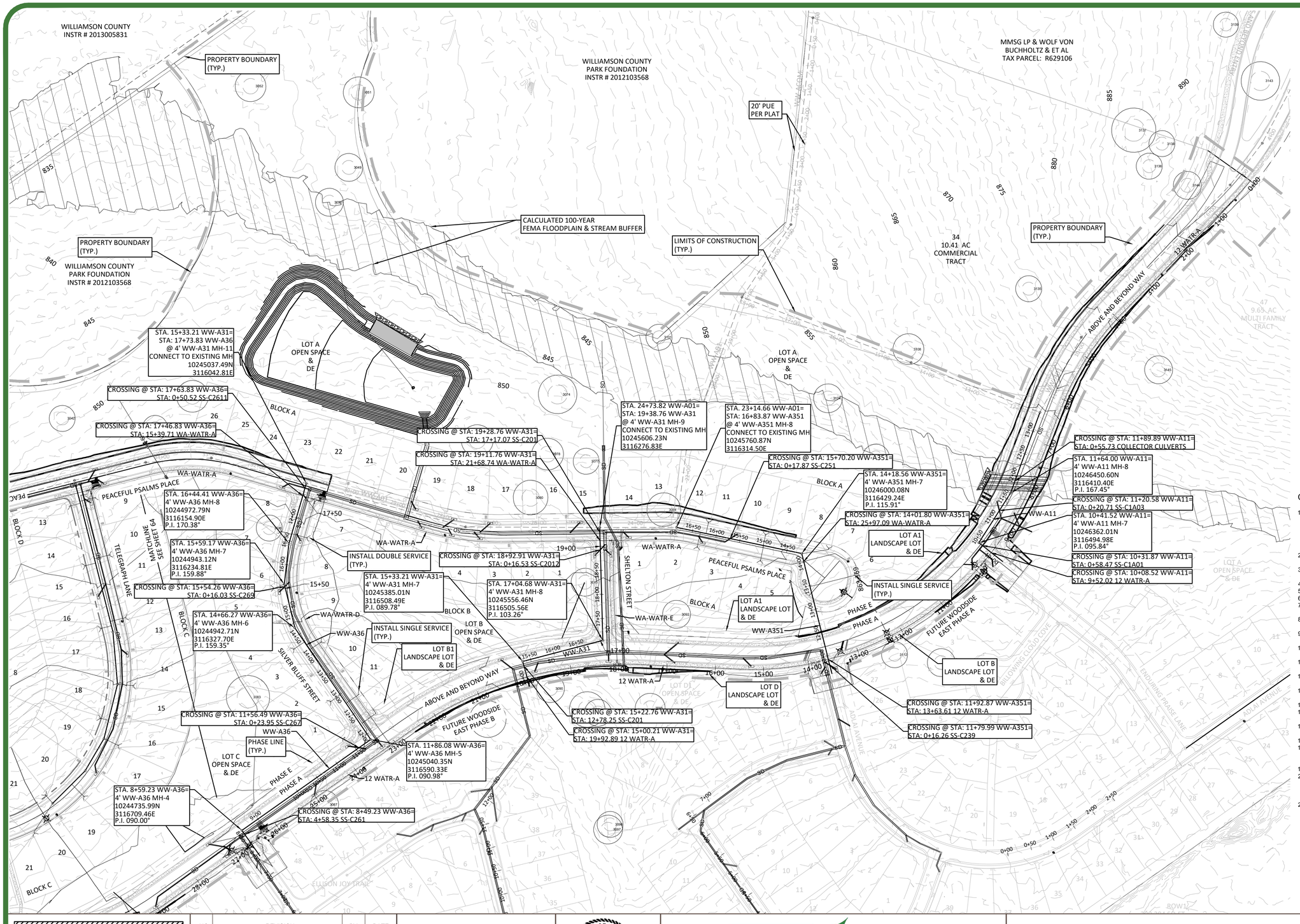
WATER QUALITY POND C3 DETAILS
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 59 of 93

2023-19-CON



LEGEND

- PROPOSED SEWER LINE
- EXISTING SEWER LINE
- PROPOSED WASTEWATER MANHOLE
- EXISTING WASTEWATER MANHOLE
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- FUTURE CURB INLET
- STORM MANHOLE
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE
- 100 MAJOR EXISTING CONTOUR
- 100 MINOR EXISTING CONTOUR
- PROPERTY BOUNDARY
- PROPOSED WATER LINE
- WL EXISTING WATER LINE
- SD PROPOSED STORM LINE
- SD EXISTING STORM LINE

* SEE MODIFIED DETAIL "W01A" FOR TYPICAL UTILITY ASSIGNMENTS

CITY OF GEORGETOWN GENERAL NOTES

1. These construction plans were prepared, sealed, signed and dated by a Texas Licensed Professional Engineer. Therefore based on the engineer's concurrence of compliance, the construction plans for construction of the proposed project are hereby approved subject to the standard Construction Specifications and Details Manual and all other applicable City, State and Federal Requirements and Codes.
2. This project is subject to all City Standard Specifications and Details in effect at the time of submittal of the project to the City.
3. The site construction plans shall meet all requirements of the approved site plan.
4. Wastewater mains and service lines shall be SDR 26 PVC.
5. Wastewater mains shall be installed without horizontal or vertical bends.
6. Maximum distance between wastewater manholes is 500 feet.
7. Wastewater mains shall be low pressure air tested and mandrel tested by the contractor according to the City of Georgetown and TCEQ requirements.
8. Wastewater manholes shall be vacuum tested and coated by the contractor according to City of Georgetown and TCEQ requirements.
9. Wastewater mains shall be camera tested by the contractor and submitted to the City on DVD format prior to paving the streets.
10. Private water system fire lines shall be tested by the contractor to 200 psi for 2 hours.
11. Private water system fire lines shall be ductile iron piping from the water main to the building sprinkler system, and 200 psi C900 PVC for all others.
12. Public water system mains shall be 150 psi C900 PVC and tested by the contractor at 150 psi for 4 hours.
13. All bends and changes in direction on water mains shall be restrained and thrust blocked.
14. Long fire hydrant leads shall be restrained.
15. All water lines are to be bacteria tested by the contractor according to the City standards and specifications.
16. Water and Sewer main crossings shall meet all requirements of the TCEQ and the City.
17. Flexible base material for public streets shall be TXDOT Type A Grade 1.
18. Hot mix asphaltic concrete pavement shall be Type D unless otherwise specified and shall be a minimum of 2 inches thick on public streets and roadways.
19. All sidewalk ramps are to be installed with the public infrastructure.
20. A maintenance bond is required to be submitted to the City prior to acceptance of the public improvements. This bond shall be established for 2 years in the amount of 10% of the cost of the public improvements and shall follow the City format.
21. Record drawings of the public improvements shall be submitted to the City by the design engineer prior to acceptance of the project. These drawings shall be PDF (300 dpi).

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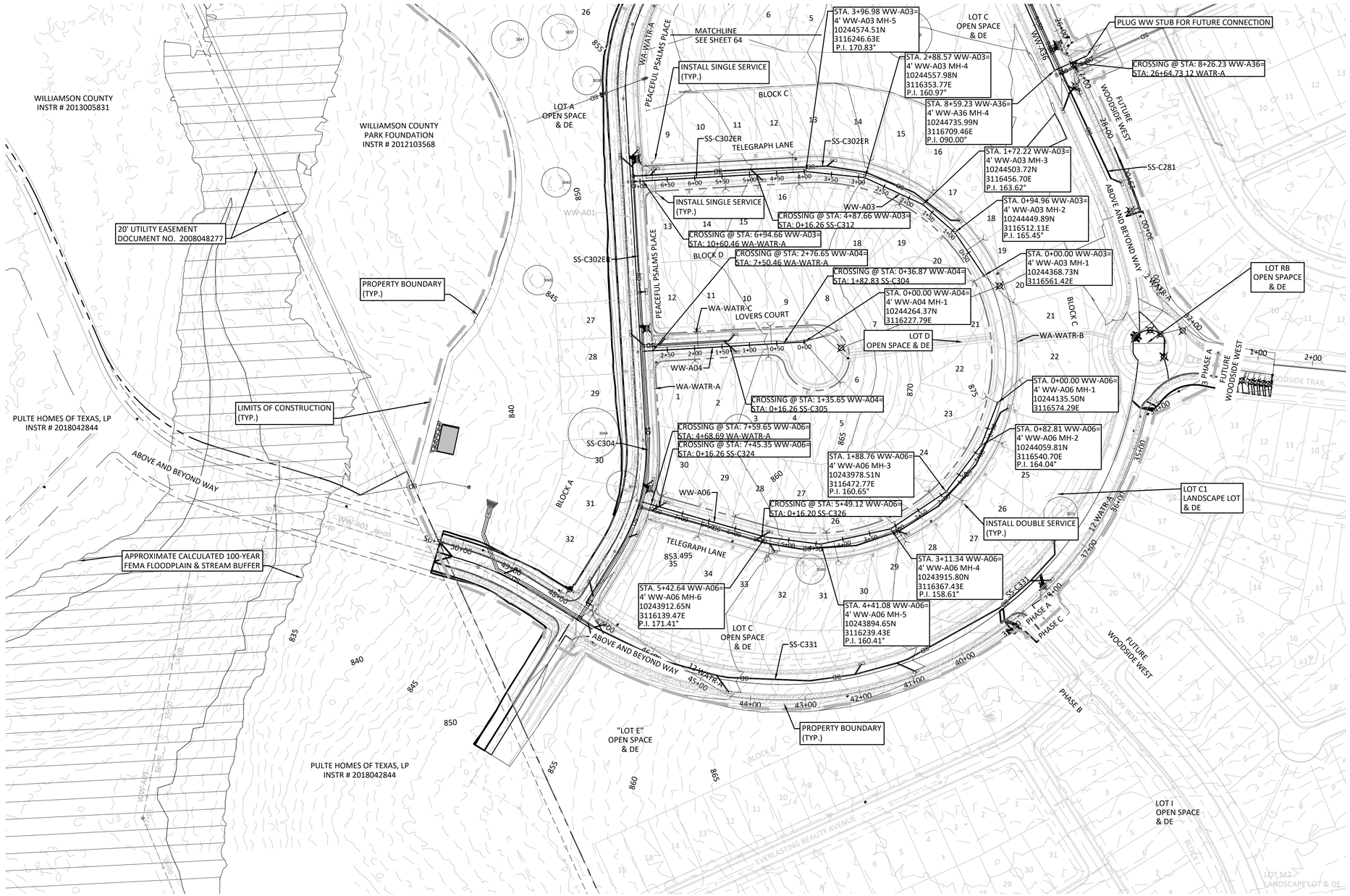
SERVICES: >>ENGINEERS >>PLANNERS >>SURVEYORS

OVERALL WASTEWATER PLAN (1 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 63 of 93

2023-19-CON



0 100 200 Feet

SCALE: 1" = 100'

LEGEND

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- EXISTING SEWER LINE
- PROPOSED WASTEWATER MANHOLE
- EXISTING WASTEWATER MANHOLE
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE
- MAJOR EXISTING CONTOUR
- MINOR EXISTING CONTOUR
- PROPERTY BOUNDARY
- PROPOSED WATER LINE
- EXISTING WATER LINE
- PROPOSED STORM LINE
- EXISTING STORM LINE

* SEE MODIFIED DETAIL "W01A" FOR TYPICAL UTILITY ASSIGNMENTS

NOTES:

1. INDIVIDUAL PRESSURE REDUCING VALVES (PRV) REQUIRED ON ALL LOTS WHERE STATIC PRESSURE IS GREATER THAN 80 PSI.
2. AT THE CONCLUSION OF CONSTRUCTION, FIRE HYDRANTS SHALL BE FLOW TESTED AND COLOR CODED IN ACCORDANCE TO CITY'S STANDARDS, AND RESULTS SHALL BE EMAILED TO THE FIRE DEPARTMENT. IFC 507.5 FIRE HYDRANTS SYSTEMS.
3. CAUTION, IF PRESSURE REDUCING VALVES WERE INSTALLED IN THIS PHASING THEY MUST BE SET PRIOR TO FIRE HYDRANT FLOW TESTING.
4. WATER PRESSURE CALCULATED USING THE 1065 PRESSURE PLANE.
5. CONNECTIONS TO EXISTING MANHOLES SHALL BE EPOXY COATED.

CITY OF GEORGETOWN GENERAL NOTES

1. These construction plans were prepared, sealed, signed and dated by a Texas Licensed Professional Engineer. Therefore based on the engineer's concurrence of compliance, the construction plans for construction of the proposed project are hereby approved subject to the standard Construction Specifications and Details Manual and all other applicable City, State and Federal Requirements and Codes.
2. This project is subject to all City Standard Specifications and Details in effect at the time of submittal of the project to the City.
3. The site construction plans shall meet all requirements of the approved site plan.
4. Wastewater mains and service lines shall be SDR 26 PVC.
5. Wastewater mains shall be installed without horizontal or vertical bends.
6. Maximum distance between wastewater manholes is 500 feet.
7. Wastewater mains shall be low pressure air tested and mandrel tested by the contractor according to the City of Georgetown and TCEQ requirements.
8. Wastewater manholes shall be vacuum tested and coated by the contractor according to City of Georgetown and TCEQ requirements.
9. Wastewater mains shall be camera tested by the contractor and submitted to the City on DVD format prior to paving the streets.
10. Private water system fire lines shall be tested by the contractor to 200 psi for 2 hours.
11. Private water system fire lines shall be ductile iron piping from the water main to the building sprinkler system, and 200 psi C900 PVC for all others.
12. Public water system mains shall be 150 psi C900 PVC and tested by the contractor at 150 psi for 4 hours.
13. All bends and changes in direction on water mains shall be restrained and thrust blocked.
14. Long fire hydrant leads shall be restrained.
15. All water lines are to be bacteria tested by the contractor according to the City standards and specifications.
16. Water and Sewer main crossings shall meet all requirements of the TCEQ and the City.
17. Flexible base material for public streets shall be TXDOT Type A Grade 1.
18. Hot mix asphaltic concrete pavement shall be Type D unless otherwise specified and shall be a minimum of 2 inches thick on public streets and roadways.
19. All sidewalk ramps are to be installed with the public infrastructure.
20. A maintenance bond is required to be submitted to the City prior to acceptance of the public improvements. This bond shall be established for 2 years in the amount of 10% of the cost of the public improvements and shall follow the City format.
21. Record drawings of the public improvements shall be submitted to the City by the design engineer prior to acceptance of the project. These drawings shall be PDF (300 dpi).

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

NO.	REVISION	BY	DATE

KYT	~~BJR/BEM~~	
DESIGNED BY:		DATE
BLM, SJT		8-16-2022
DRAWN BY:		DATE
SJT		8-19-2022
CHECKED BY:		DATE
BEM		8-22-2022
APPROVED BY:		DATE

STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED PROFESSIONAL ENGINEER · 08/24/2023

STEGER BIZZELL

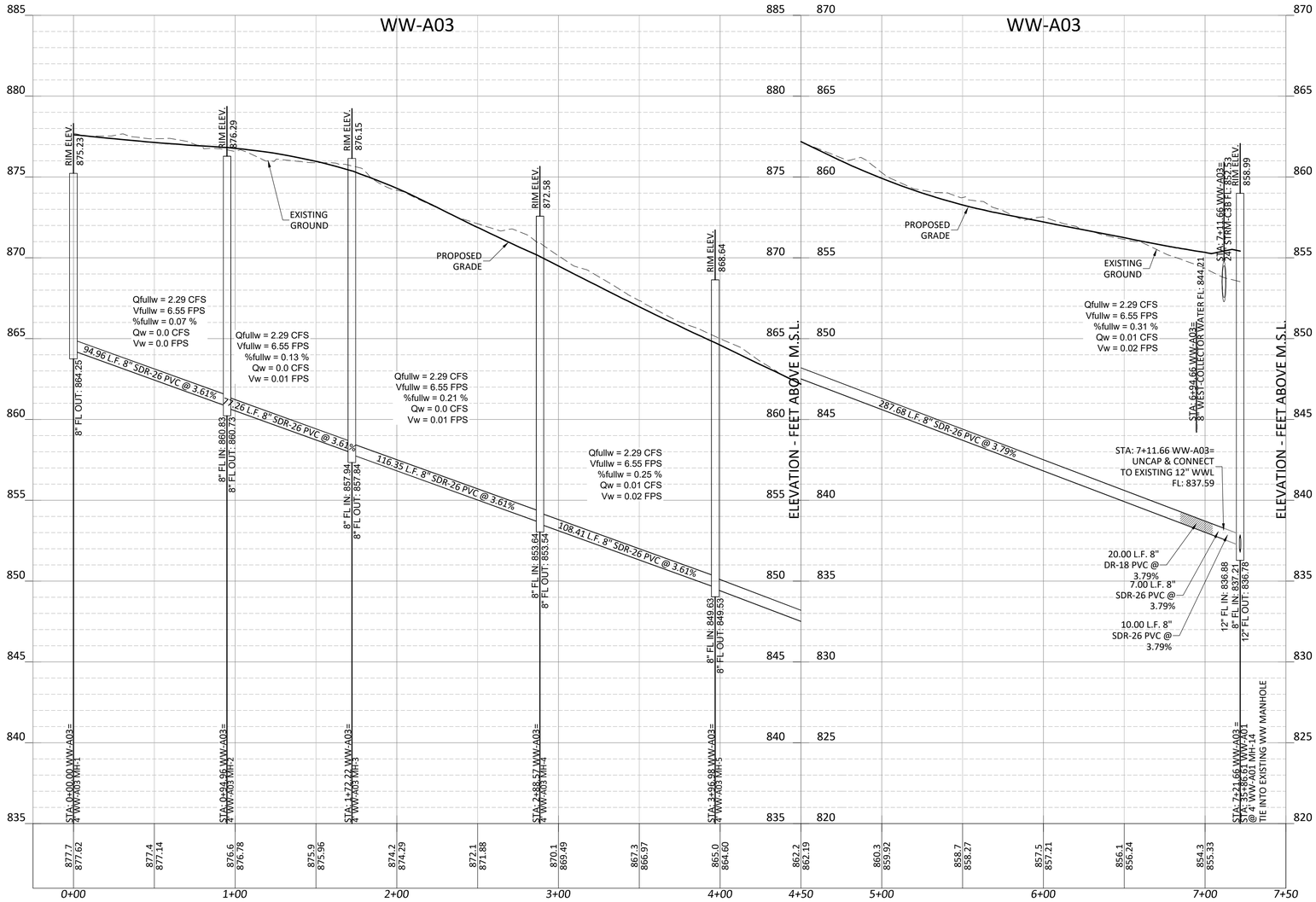
ADDRESS 1978 S. AUSTIN AVENUE | GEORGETOWN, TX 78626
METRO 512.930.9412 | TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 | WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

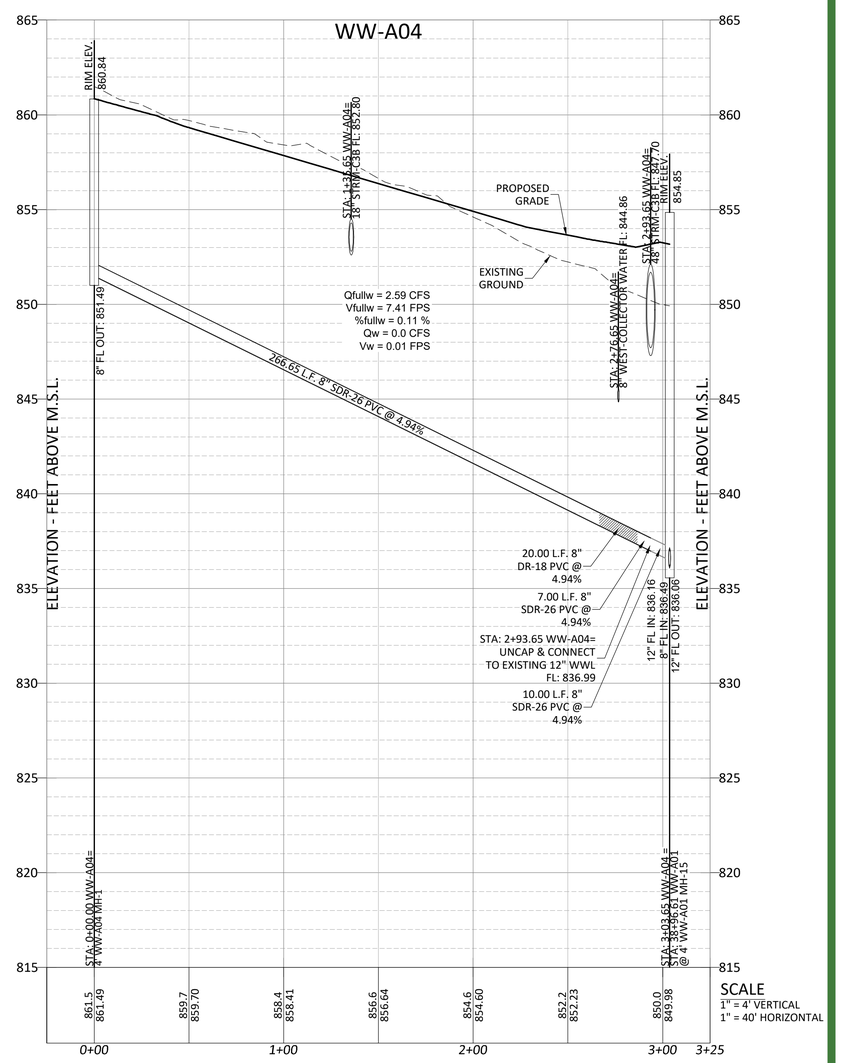
OVERALL WASTEWATER PLAN (2 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 64 of 93

2023-19-CON





SCALE
1" = 4' VERTICAL
1" = 40' HORIZONTAL

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STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
08/24/2023

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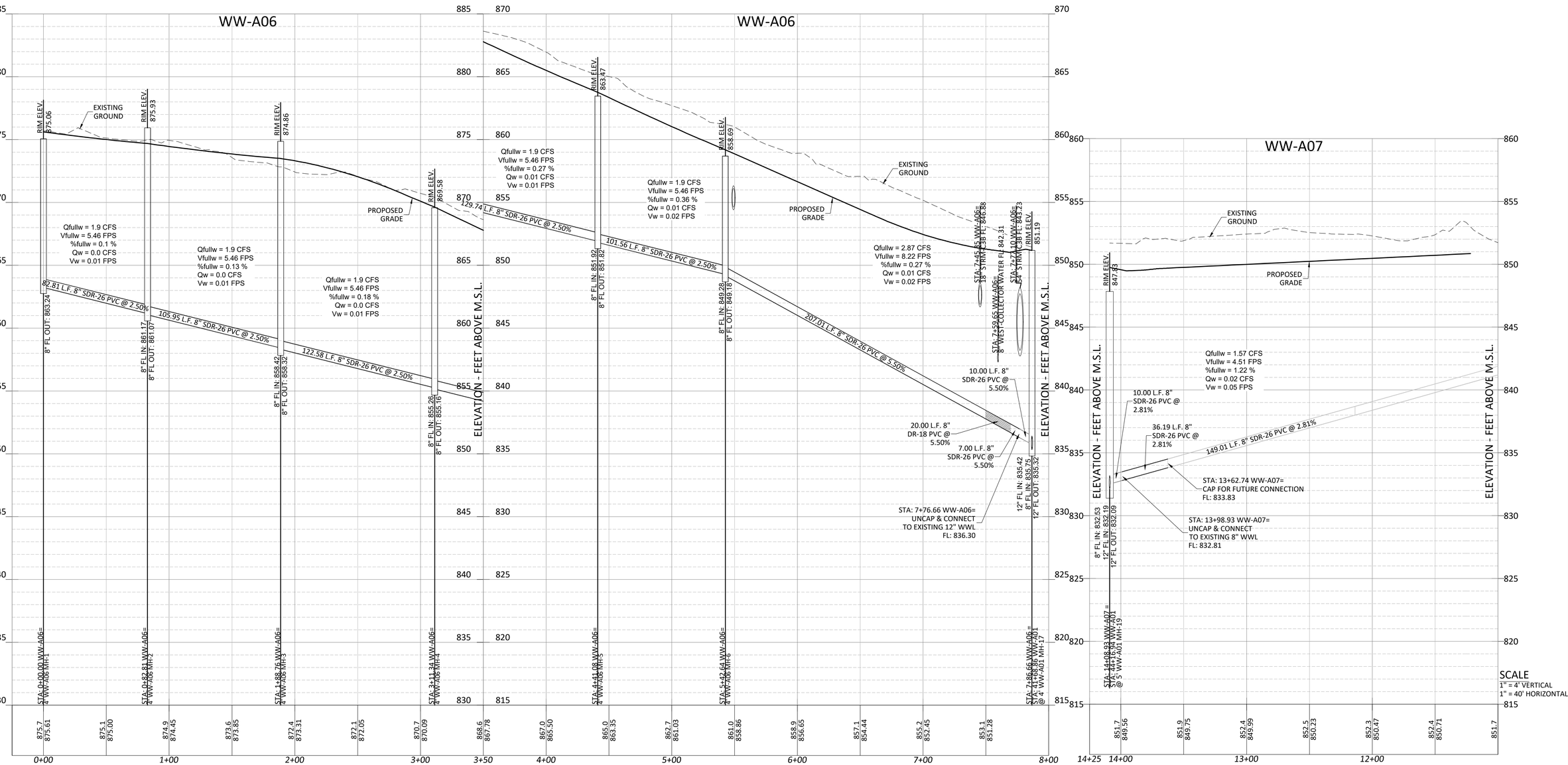
WW-A03 & WW-A04 PROFILE
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 65 of 93

2023-19-CON



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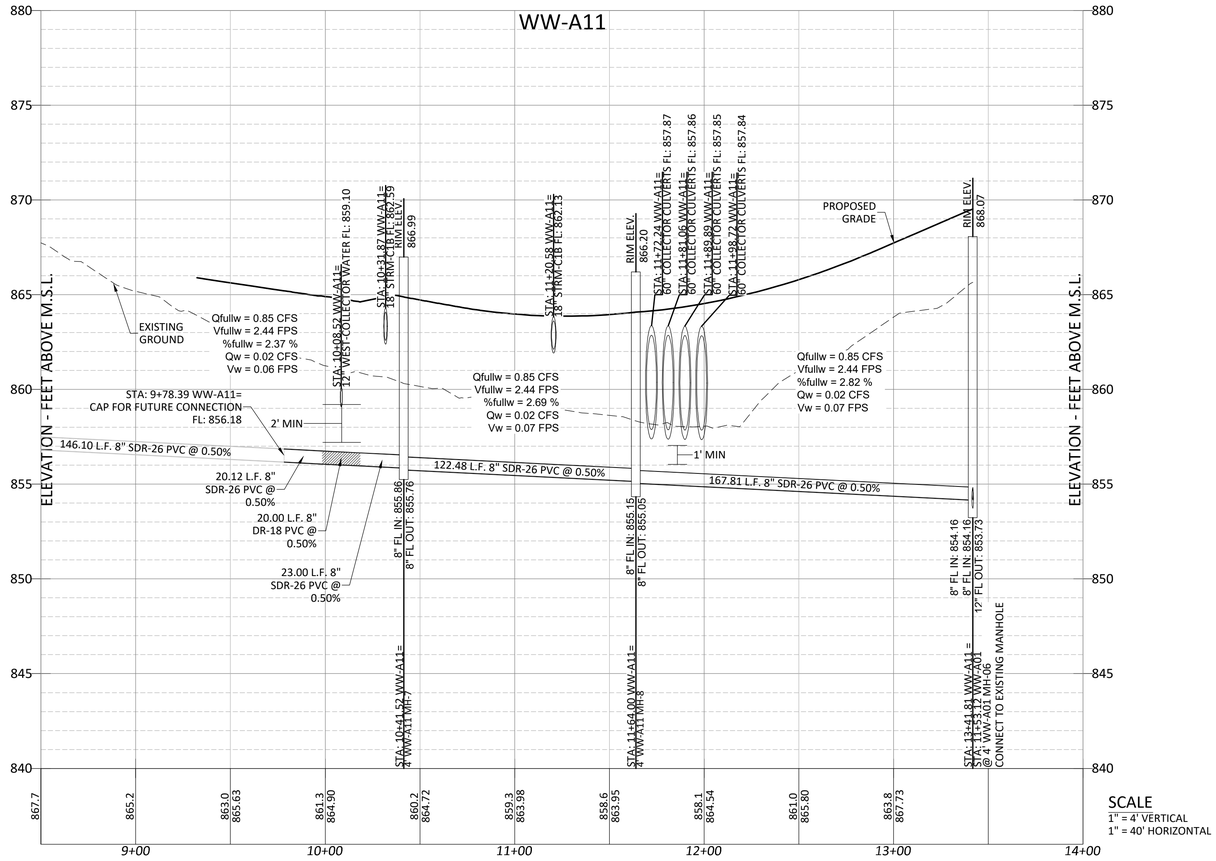
WW-A06 & WW-A07 PROFILE
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 66 of 93

2023-19-CON



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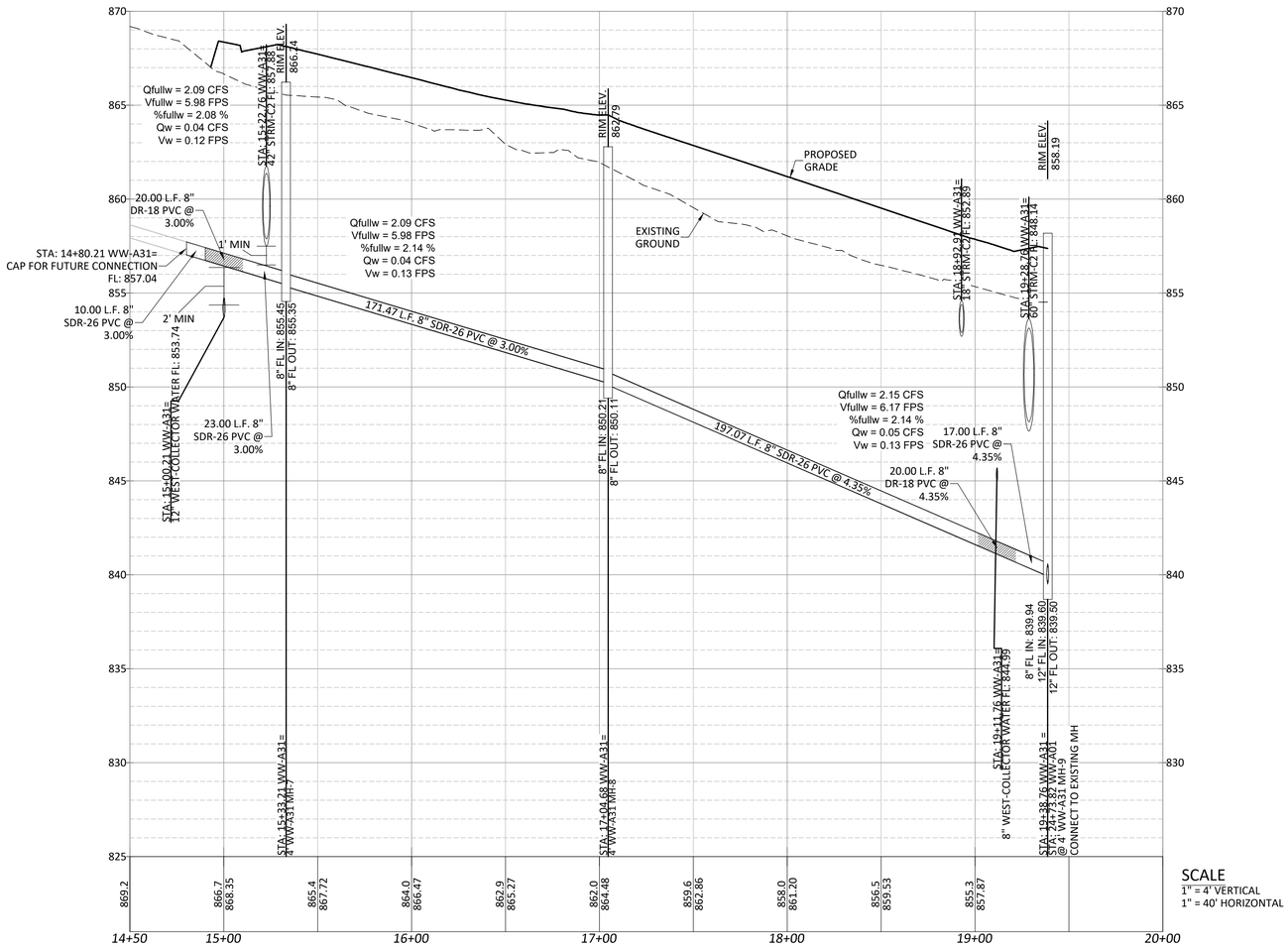
WW-A11 PROFILE
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 67 of 93

2023-19-CON

WW-A31



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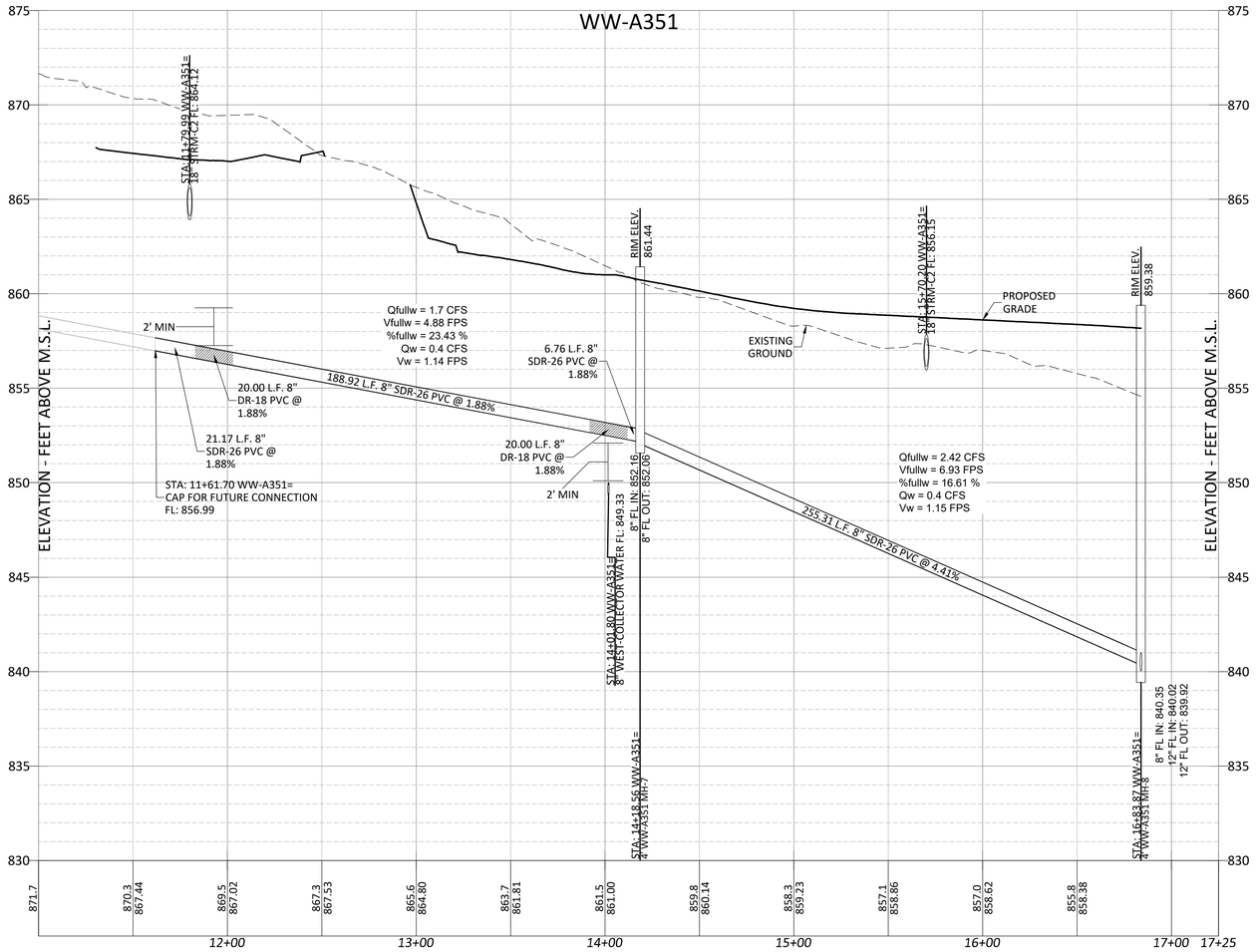
WW-A31 PROFILE
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 68 of 93

2023-19-CON



SCALE
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1" = 40' HORIZONTAL

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STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED · PROFESSIONAL ENGINEER
08/24/2023

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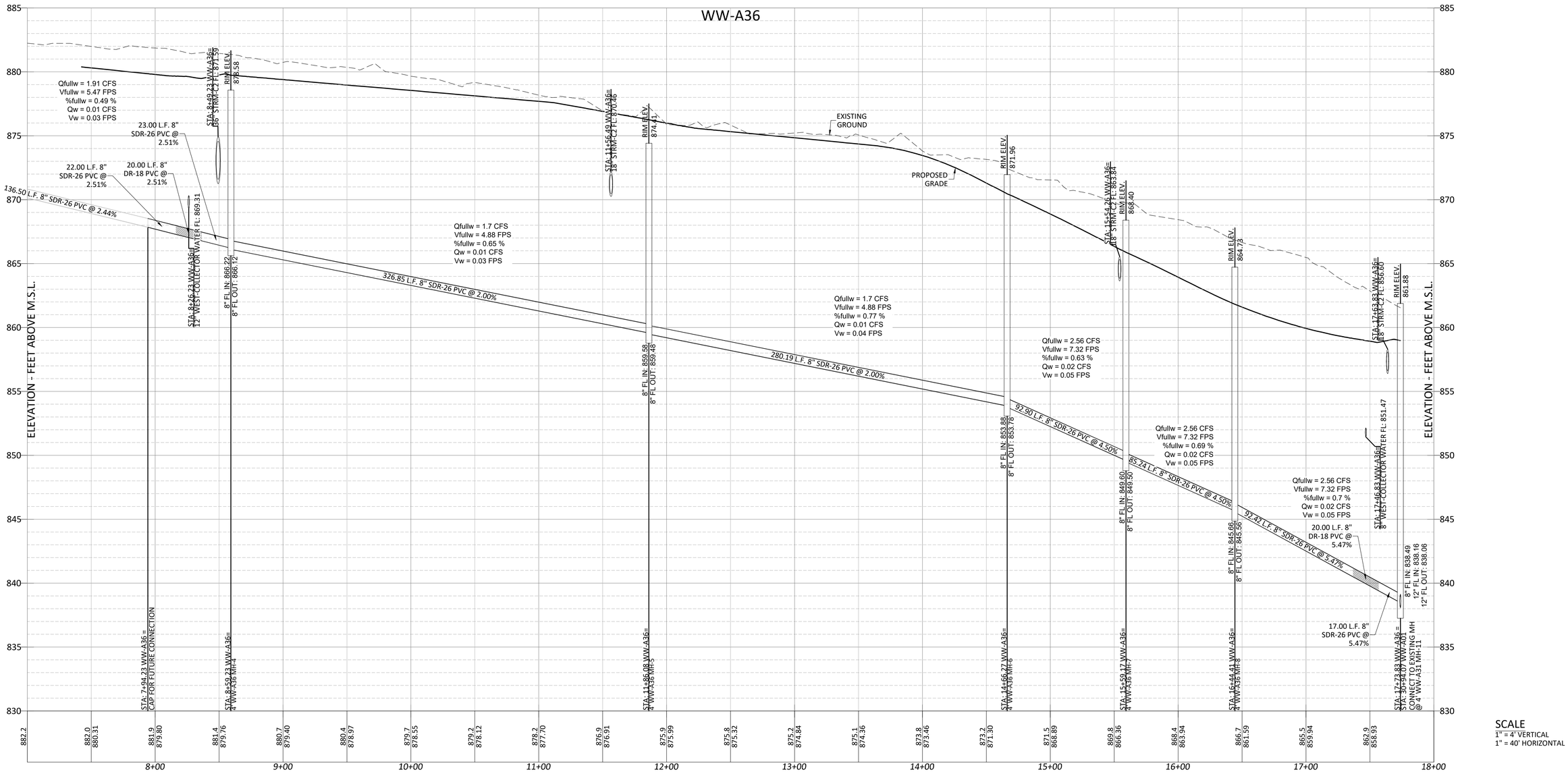
WW-A351 PROFILE
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 69 of 93

2023-19-CON

WW-A36



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STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED PROFESSIONAL ENGINEER · 08/24/2023

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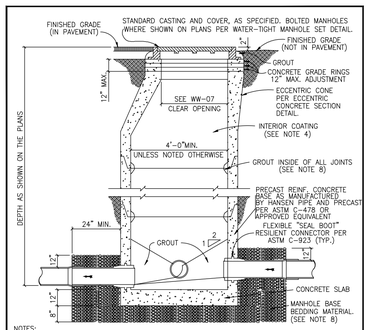
WW-A36 PROFILE
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 70 of 93

2023-19-CON



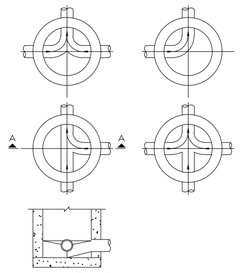
NOTES:
1. MANHOLES SHALL BE PRECAST ASTM C-478 BELL AND SPIGOT WITH PROFILE GASKET – SINGLE OFF-SET JOINTS.
2. SEE PLANS AND MANHOLE SCHEDULE, FOR MANHOLE SIZE, LOCATION, CONFIGURATION, TYPE OF TOP SECTION, VENTING REQUIREMENTS, PIPE SIZE AND TYPE.
3. SEE SPECIFICATIONS FOR MATERIALS AND CONSTRUCTION.
4. AN 80 MIL COAT OF RAVEN LINING SYSTEMS, RAVEN 405 ULTRA HIGH BUILD EPOXY COATING, OR SPRAY WALL EPOXY COATING, OR APPROVED EQUAL, TO BE APPLIED TO ENTIRE INTERIOR OF EACH WASTEWATER MANHOLE AND UNDERSIDE OF FLAT TOPS.
5. ALL MANHOLE COVERS SHALL BE BOLTED AND GASKETED WHEN MANHOLES ARE LOCATED OUT FROM PAVEMENT.
6. MANHOLES TO BE VENTED ARE IDENTIFIED ON MANHOLE SCHEDULE. REFERENCE MANHOLE VENT DETAIL.
7. MANHOLES ARE TO BE DESIGNED TO RESIST LATERAL AND VERTICAL SOIL FORCES RESULTING FROM MANHOLE DEPTH. ADDITIONALLY, MANHOLES LOCATED IN PAVEMENT TO BE DESIGNED FOR HS-20 TRAFFIC LOADING.
8. GROUT SHALL MEET THE REQUIREMENTS AS STATED BY THE COATING MANUFACTURER.
9. MANHOLE BASE BEDDING MATERIAL SPECS: FOR 3/4" WASHED GRAVEL:
   SIEVE SIZE 2", PERCENT (%) RETAINED 0
   SIEVE SIZE 1 1/2", % RETAINED 0-10
   SIEVE SIZE 1", % RETAINED 45-80
   SIEVE SIZE 3/4", % RETAINED 85-100
   SIEVE SIZE 3/8", % RETAINED 95-100

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION MISC. ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
STANDARD MANHOLE – SECTION
DRAWING NAME: WW0.3
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB

FLOW PATTERNS FOR INVERT CHANNELS



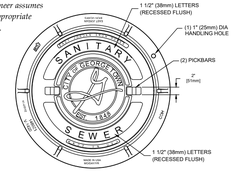
NOTES:
1. INVERT CHANNELS TO BE CONSTRUCTED FOR SMOOTH FLOW WITH NO OBSTRUCTIONS.
2. SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS PROVIDING FOR SMOOTH FLOW.
3. CHANNELS FOR FUTURE CONSTRUCTIONS (STUBS) SHALL BE CONSTRUCTED, FILLED WITH SAND, AND COVERED WITH 1" OF MORTAR.
4. SLOPE MANHOLE ITSELF WITH A 1:2 SLOPE FROM MANHOLE WALL TO CHANNEL.
5. INVERT SHALL BE A MINIMUM OF 1/2 THE DIAMETER OF THE LARGEST PIPE OR 4" DEEP.

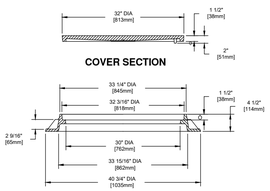
The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION MISC. ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
FLOW PATTERNS FOR INVERT CHANNELS
DRAWING NAME: WW06
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.





COVER SECTION

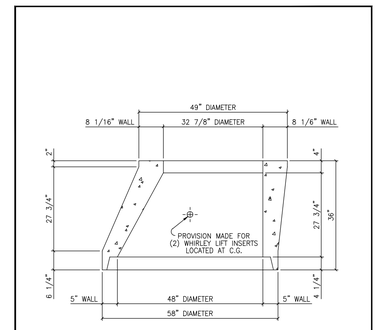
FRAME SECTION

NOTES:
1. STANDARD WASTEWATER MANHOLE SET TO BE EAST JORDAN IRON WORKS, INC. CATALOG NO. 1480A V-1420/1480Z1, COVER TO BE STAMPED WITH "SANITARY SEWER".
2. STANDARD WASTEWATER MANHOLE SET TO BE HEAVY DUTY LOAD RATED.
3. FOR MORE DETAILED SPECIFICATIONS REFER TO EAST JORDAN IRON WORKS, INC. REFERENCE PRODUCT DRAWING, 41420012 (20148390).
4. FOR BOLTED WASTEWATER MANHOLE SET REFER TO DETAIL WW07A.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION MISC. ADOPTED 6/21/2006

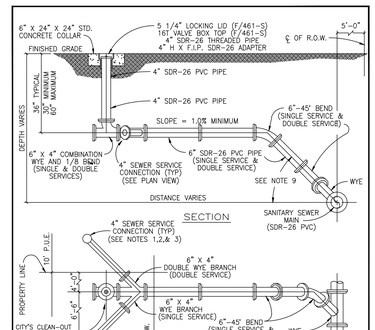
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
STANDARD WASTEWATER MANHOLE SET
DRAWING NAME: WW07
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB



The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION MISC. ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
48"X5" TO 33"X8"X36" TALL ECCENTRIC CONCRETE SECTION
DRAWING NAME: WW08
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB

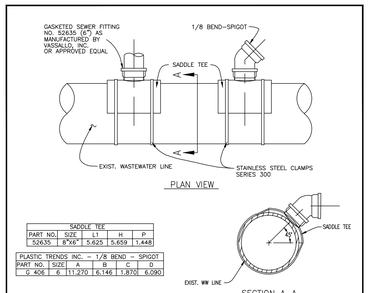


NOTES:
1. SERVICE CONNECTION RISERS SHALL TERMINATE 8' INSIDE THE PROPETY LINE.
2. THE END OF EACH SERVICE CONNECTION RISER SHALL BE EXTENDED 12" ABOVE FINISH GRADE.
3. EACH SERVICE CONNECTION SHALL BE PLUGGED WATER-TIGHT WITH AN APPROVED CAP OR PLUG.
4. FOR P.V.C. INSTALLATIONS, CONNECT TO EXISTING "BELL END" AND CONNECT OPPSITE END WITH P.V.C. TO P.V.C. KNOCK ON SLEEVE.
5. SOLIDLY TAMP BACKFILL AT LEAST ONE FOOT (1'-0") ABOVE TOP OF PIPE. SERVICES UNDER PAVED AREAS SHALL BE BACKFILLED TO THE SAME SPECIFICATIONS AS SHOWN ON PAVEMENT REPLACEMENT DETAIL.
6. CONTRACTOR SHALL MARK ON A CLEAN SET OF PLANS THE FINAL STATIONING OR DISTANCE AND DIRECTION FROM MANHOLE TO EACH SERVICE LATERAL AND GIVE TO ENGINEER FOR RECORD DRAWING PURPOSES.
7. ANY DEVIATION FROM THESE METHODS MUST BE APPROVED BY THE CITY OF GEORGETOWN ENGINEERING DEPARTMENT.
8. SERVICE LINE MATERIAL SHALL BE P.V.C., SDR-26.
9. SEWER SERVICE SLOPE TO BE 45° OFF CENTERLINE OF MAIN.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION MISC. ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
SEWER SERVICE CONNECTIONS
DRAWING NAME: WW13
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB



SADDLE TEE				
PART NO.	SIZE	L1	H	P
52635	8"X6"	5.625	5.659	1.448

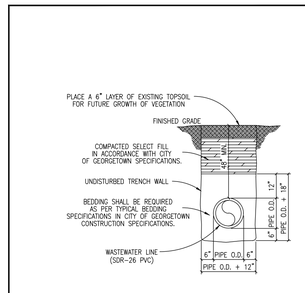
PLASTIC TRENZE INC. – 1/8 BEND – SPIGOT					
PART NO.	SIZE	A	B	C	D
G 406	6	11.270	6.146	1.870	6.090

NOTES:
1. FLEXIBLE SADDLE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.
2. SADDLE TEE SHALL BE ORIENTATED 45° TO MAIN. (SEE SEWER SERVICE CONNECTIONS DETAIL — DWG # WW-13)
3. EXCAVATE AROUND EXISTING 8-INCH PIPE, EXPOSING SUFFICIENT ROOM FOR S.S. CLAMPS.
4. THOROUGHLY CLEAN AND DRY THE MATING SURFACE WITH RAG OR PAPER TOWEL MAKE SURE THEY ARE FREE OF DUST AND MOISTURE.
5. MARK THE SIZE OF THE HOLE TO BE CUT USING THE GASKET SKIRT ON THE SADDLE ITSELF AS THE TEMPLATE.
6. SAW OUT THE SECTION OF THE PIPE WHERE THE SADDLE WILL BE LOCATED, WITH A SABER OR KEY HOLE SAW.
7. TEST TO MAKE SURE SADDLE FITS HOLE PROPERLY.
8. SERVICE PIPE SHALL NOT EXTEND MORE THAN ONE-HALF INCH INTO THE MAIN.
9. PLACE GASKET SKIRT AND SADDLE OVER OPENING AND TIGHTEN BAND CLAMPS EVENLY UNTIL SADDLE IS FIRMLY ATTACHED TO THE PIPE. APPLY PRESSURE ON THE SADDLE AGAINST THE PIPE WHILE TIGHTENING THE CLAMPS AS INDICATED ABOVE, DO NOT OVER TIGHTEN, DO NOT STRIP THREAD.
10. REPLACE THE BEDDING AND BACKFILL IN ACCORDANCE WITH THE TRENCH EMBEDMENT DETAIL.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION MISC. ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
GASKETED SEWER FITTING FOR SEWER SERVICE CONNECTIONS TO EXISTING MAINS
DRAWING NAME: WW1.3A
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB

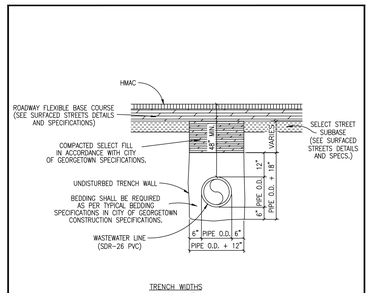


TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION MISC. ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT DETAIL UNDER NON-PAVED AREAS
DRAWING NAME: WW16
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB



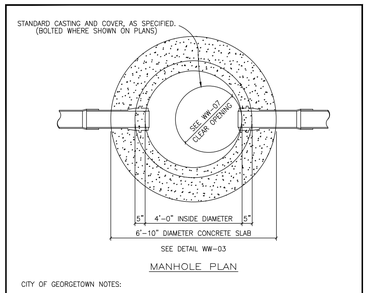
TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

NOTES:
1. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS AND STANDARDS.
2. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL (SEE C9 FLOWABLE BACKFILL FOR THE SPECIFICATION).

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION MISC. ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT DETAIL UNDER PROPOSED ROADWAY
DRAWING NAME: WW18
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB



SEE DETAIL WW-03

MANHOLE PLAN

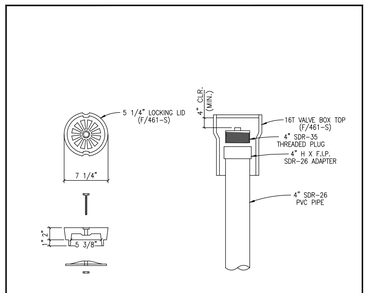
CITY OF GEORGETOWN NOTES:

MANHOLE DETAILS SHALL REFLECT THE CITY'S MINIMUM SPECIFICATIONS, AS STATED BELOW:
A. ALL MANHOLES SHALL BE 48" I.D., R.C.P., CLASS III, WITH RUBBER PROFILE GASKET – SINGLE OFF-SET JOINT CONFORMING TO ASTM C478, C433 AND C76.
B. ALL MANHOLES SHALL HAVE FRAME AND COVER, AS MANUFACTURED BY EAST JORDAN IRON WORKS (AS PER DETAIL # WW-07) OR APPROVED EQUIVALENT.
C. ALL MANHOLES SHALL BE CONCRETE WITH CAST IRON FRAME AND COVER.
D. ALL MANHOLES SHALL HAVE AN ECCENTRIC CONE.
E. MANHOLES MAY HAVE A FLAT LID, IF APPROVED BY CITY OF GEORGETOWN, BEING 12" THICK WITH A MINIMUM 30" OPENING, AS MANUFACTURED BY HANSEN PIPE AND PRECAST OR APPROVED EQUAL M.F.G. CONFORMING TO ASTM C478, 5000 P.S.I. CONCRETE, TRAFFIC BEARING AND WITH PROFILE GASKET – SINGLE OFF-SET JOINT CONFORMING TO ASTM C443.
F. INVERTS AND FLEXIBLE SEAL BOOTS, PER ASTM C-923, SHALL BE CAST INTO BASE SECTION.
G. MINIMUM DROP BETWEEN INVERTS SHALL BE ONE-TENTH OF A FOOT (0.1').
H. GRADE RINGS WITH AN I.D. TO MATCH FRAMES CLEAR OPENING WITH A MAXIMUM ADJUSTMENT OF 12" ARE ALLOWED.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION MISC. ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
STANDARD MANHOLE – PLAN
DRAWING NAME: WW02
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB



The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION MISC. ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
SEWER CLEAN-OUT DETAIL
DRAWING NAME: WW12
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

NO.	REVISION	BY	DATE

SJT — DESIGNED BY: — 8-10-2022 DATE
BLM, SJT — DRAWN BY: — 8-16-2022 DATE
SJT — CHECKED BY: — 8-19-2022 DATE
BEM — APPROVED BY: — 8-22-2022 DATE

STATE OF TEXAS — BRYAN ERIC MOORE — 98920 — LICENSED PROFESSIONAL ENGINEER
08/24/2023

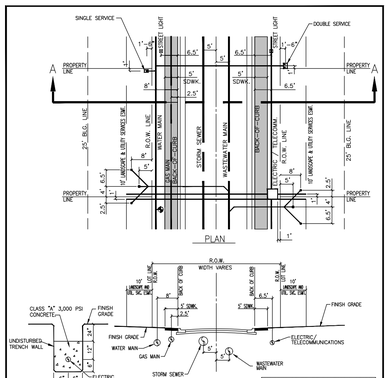
STEGER BIZZELL
ADDRESS: 1978 S. AUSTIN AVENUE, GEORGETOWN, TX 78626
METRO: 512.930.9412 | TEXAS REGISTERED ENGINEERING FIRM F-181, TBPLS FIRM No.10003700 | WEB: STEGERBIZZELL.COM
SERVICES: >>ENGINEERS >>PLANNERS >>SURVEYORS

WASTEWATER DETAILS (1 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 71 of 93

2023-19-CON



NOTE: WHEN CROSSING A WATER MAIN, THE ELECTRIC CONDUIT MUST BE ENCASED WITH 3,000 PSI CONCRETE FOR A MIN. OF 10 FEET BOTH SIDES FROM THE CROSSING POINT.

ELECTRIC CONDUIT
CONCRETE ENCASEMENT DETAIL

MINIMUM COVER BELOW FINISH-GRADE ALL UTILITIES UNDER ROADWAY - 36"	
ELECTRIC PRIMARY	36"
ELECTRIC SECONDARY	24"
WATER	36"
WASTEWATER	48"
STORM SEWER	36"
GAS	36"
TELECOMMUNICATIONS	36"

CLASSIFICATION	ROW	B-B	PVMT.
LOCAL STREET	50'	28'	24'
RESIDENTIAL STREET	65'	37'	33'
MAJOR COLLECTOR	73'	45'	41'

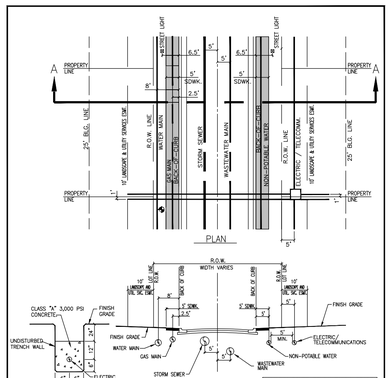
The Architect/Engineer assumes responsibility for appropriate use of this standard.

MODIFIED 09/15/2015
FOR SUN CITY ONLY

DESIGN MAY ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
UTILITY ASSIGNMENTS FOR LOCAL STREETS

DRAWING NO. W01A-MODIFIED 01
SCALE NTS DATE 1/2003
DRAWN BY MPS CHECKED BY TRB



NOTE: WHEN CROSSING A WATER MAIN, THE ELECTRIC CONDUIT MUST BE ENCASED WITH 3,000 PSI CONCRETE FOR A MIN. OF 10 FEET BOTH SIDES FROM THE CROSSING POINT.

ELECTRIC CONDUIT
CONCRETE ENCASEMENT DETAIL

MINIMUM COVER BELOW FINISH-GRADE ALL UTILITIES UNDER ROADWAY - 36"	
ELECTRIC PRIMARY	36"
ELECTRIC SECONDARY	24"
WATER	36"
WASTEWATER	48"
STORM SEWER	36"
GAS	36"
TELECOMMUNICATIONS	36"
NON-POTABLE WATER	36"

CLASSIFICATION	ROW	B-B	PVMT.
LOCAL STREET	50'	28'	24'
RESIDENTIAL STREET	65'	37'	33'
MAJOR COLLECTOR	73'	45'	41'

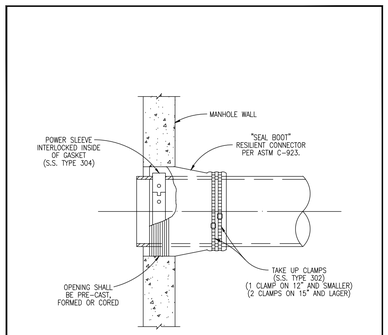
The Architect/Engineer assumes responsibility for appropriate use of this standard.

MODIFIED 09/15/2015
FOR SUN CITY ONLY

DESIGN MAY ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
UTILITY ASSIGNMENTS FOR RESIDENTIAL COLLECTORS AND MAJOR COLLECTORS

DRAWING NO. W01A-MODIFIED 02
SCALE NTS DATE 1/2003
DRAWN BY MPS CHECKED BY TRB

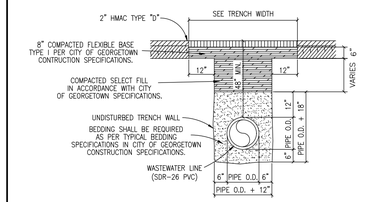


The Architect/Engineer assumes responsibility for appropriate use of this standard.

DESIGN MAY ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
FLEXIBLE "SEAL BOOT" CONNECTOR

DRAWING NO. WW10
SCALE NTS DATE 1/2003
DRAWN BY MPS CHECKED BY TRB



TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

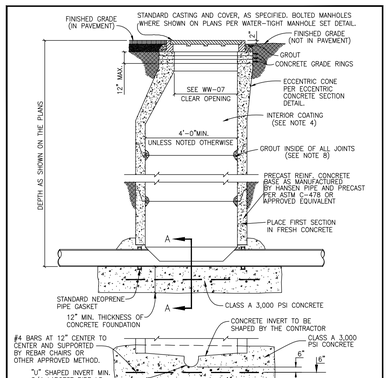
NOTES:
1. REPLACED BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE.
2. BASE MATERIAL SHALL BE PLACED IN MULTIPLE LIFTS NOT TO EXCEED 6". EACH LAYER SHALL BE THOROUGHLY ROLLED OR TAMPED TO SPECIFIED MAXIMUM DENSITY.
3. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED.
4. SURFACE MATERIAL WILL BE CONSISTENT WITH THE EXISTING SURFACE.
5. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS AND STANDARDS.
6. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL (SEE C9 FLOWABLE BACKFILL FOR THE SPECIFICATION).

The Architect/Engineer assumes responsibility for appropriate use of this standard.

DESIGN MAY ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT AND PAVEMENT REPLACEMENT DETAIL UNDER EXISTING ROADWAY

DRAWING NO. WW17
SCALE NTS DATE 1/2003
DRAWN BY MPS CHECKED BY TRB



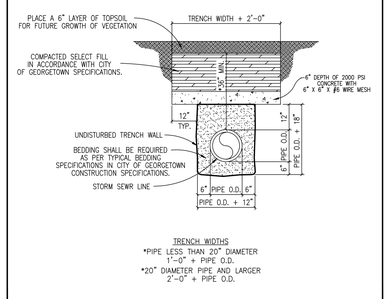
NOTES:
1. MANHOLES SHALL BE PRECAST ASTM C-478 BELL AND SPIGOT WITH PROFILE GASKET – SINGLE OFF-SET JOINTS.
2. SEE MAN FLANG AND MANHOLE SCHEDULE, FOR MANHOLE SIZE, LOCATION, CONFIGURATION, TYPE OF TOP SECTION, VENTING REQUIREMENTS, PIPE SIZE AND TYPES.
3. SEE SPECIFICATIONS ON MATERIALS AND CONSTRUCTION.
4. AN 80 MIL COAT OF RAVEN LINING SYSTEMS, RAVEN 405 ULTRA HIGH BUILD EPOXY COATING, OR SPRAY MALL EPOXY COATING, OR APPROVED EQUAL, TO BE APPLIED TO ENTIRE INTERIOR OF EACH WASTEWATER MANHOLE AND UNDERSIDE OF FLAT TOPS.
5. ALL MANHOLE COVERS SHALL BE BOLTED AND GASKETED WHEN MANHOLES ARE LOCATED OUT FROM PAVEMENT.
6. MANHOLES SHALL BE VENTED ACCORDING TO MANHOLE SCHEDULE, REFERENCE MANHOLE VENT DETAIL.
7. MANHOLE TOP SECTIONS SHALL BE ECCENTRIC CONE TYPE WITH TOP OF CONE 6" RESULTING FROM MANHOLE DEPTH. ADDITIONALLY, MANHOLES LOCATED IN PAVEMENT TO BE DESIGNED FOR HS-20 TRAFFIC LOADS.
8. GROUT SHALL MEET THE REQUIREMENTS AS STATED BY THE COATING MANUFACTURER.
9. MANHOLE BASE BEDDING MATERIAL SPECS, FOR 3/4" RHEOID GRAVEL:
SIEVE SIZE 1", PERCENT (%) RETAINED 0 SIEVE SIZE 1 1/2", % RETAINED 0-10
SIEVE SIZE 1", % RETAINED 40-90 SIEVE SIZE 3/4", % RETAINED 85-100
SIEVE SIZE 3/8", % RETAINED 95-100
10. ALL PVC PIPE SHALL BE REMOVED FROM INVERT.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

DESIGN MAY ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
PRECAST MANHOLE ON CAST-IN-PLACE FOUNDATION

DRAWING NO. WW20
SCALE NTS DATE 1/2006
DRAWN BY MPS CHECKED BY TRB



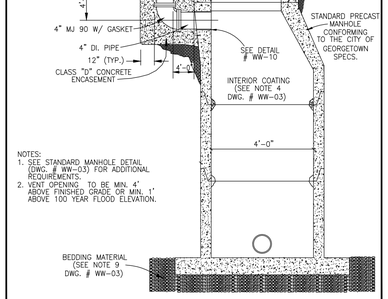
TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

DESIGN MAY ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CONCRETE TRANCH CAP DETAIL FOR STORM SEWER

DRAWING NO. SD39
SCALE NTS DATE 1/2003
DRAWN BY MPS CHECKED BY TRB



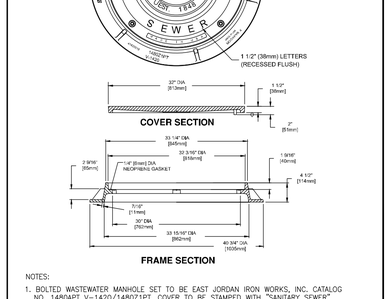
NOTES:
1. SEE STANDARD MANHOLE DETAIL (DWG. # WW-03) FOR ADDITIONAL REQUIREMENTS.
2. VENT OPENING TO BE MIN. 4' ABOVE FINISHED GRADE OR MIN. 1' ABOVE 100 YEAR FLOOD ELEVATION.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

DESIGN MAY ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL MANHOLE WITH VENT

DRAWING NO. WW19
SCALE NTS DATE 1/2003
DRAWN BY MPS CHECKED BY TRB



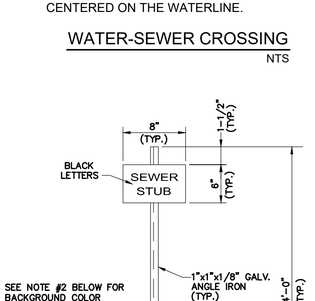
NOTES:
1. BOLTED WASTEWATER MANHOLE SET TO BE EAST JORDAN IRON WORKS, INC. CATALOG NO. 1480APT V=1420/1480ZTPT, COVER TO BE STAMPED WITH "SANITARY SEWER".
2. BOLTED WASTEWATER MANHOLE SET TO BE HEAVY DUTY LOAD RATED.
3. FOR MORE DETAILED SPECIFICATIONS REFER TO EAST JORDAN IRON WORKS, INC. REFERENCE PRODUCT DRAWING 001483921 41420015.
4. FOR STANDARD WASTEWATER MANHOLE SET REFER TO DETAIL WW07.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

DESIGN MAY ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
BOLTED WASTEWATER MANHOLE SET

DRAWING NO. WW07A
SCALE NTS DATE 1/2006
DRAWN BY MPS CHECKED BY TRB



NOTE:
WHERE WATER & SEWER LINES CROSS AND ARE LESS THAN 9' APART, A FULL JOINT OF C900 DR-18 PVC PIPE MUST BE CENTERED ON THE WATERLINE.

WATER-SEWER CROSSING
NTS

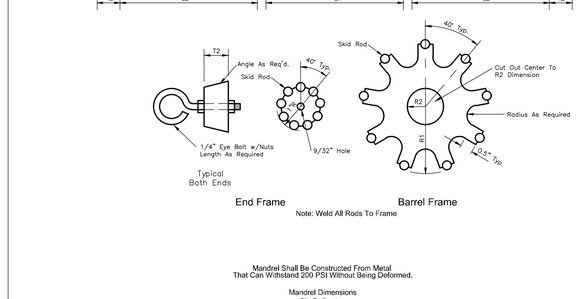
SEWER STUB MARKERS

(INSTALL AT ALL SEWER STUB-OUT ENDS AND SERVICE ENDS)

NOTES:
1) **SIGNS SHALL BE CONSTRUCTED OF 20 GAUGE STEEL w/BAKED ENAMEL FINISH.**
2) **THE BACKGROUND COLOR FOR THE SIGNS SHALL BE WHITE.**
3) **THERE SHALL BE NO SEPARATE BID ITEM FOR MARKERS.**

SERVICE MARKER DETAIL

NOTES:
1. SEE SHEET 37 FOR WW05, DROP MANHOLE TYPE "B" DETAIL.



End Frame Barrel Frame

Note: Weld All Rods To Frame

Mandrel Shall Be Constructed From Metal That Can Withstand 200 PSI Without Being Deformed.

Mandrel Dimensions
5% Deflection
For O.D. Controlled PVC Pipe
(All Dimensions In Inches)

	Size	Type	O.D. Average	Min. Wall Thickness	L1	L2	R1	R2	T1	T2	Rod Diameter	MANDREL O.D.
	6"	D3034 SDR35	6.275	0.180	4.50	6	2.81	0.75	0.375	1.0	0.375	5.62
	6"	D3034 SDR26	6.275	0.241	4.50	6	2.75	0.75	0.375	1.0	0.375	5.50
(160 PSI)	6"	D2241 DR26	6.625	0.271	4.50	6	2.89	0.75	0.375	1.0	0.375	5.71
	8"	D3034 SDR35	8.400	0.240	6.00	6	3.96	1.25	0.375	1.0	0.375	7.52
	8"	D3034 SDR26	8.400	0.323	6.00	6	3.68	1.25	0.375	1.0	0.375	7.37
(160 PSI)	8"	D2241 DR26	8.625	0.352	6.00	6	3.76	1.25	0.375	1.0	0.375	7.525
	10"	D3034 SDR35	10.500	0.300	7.50	6	4.70	1.50	0.375	1.0	0.375	9.40
	10"	D3034 SDR26	10.500	0.404	7.50	6	4.60	1.50	0.375	1.0	0.375	9.21
	12"	D3034 SDR35	12.500	0.360	9.00	6	5.60	1.75	0.375	1.0	0.375	11.20
	12"	D3034 SDR26	12.500	0.481	9.00	6	5.48	1.75	0.375	1.0	0.375	10.96
	15"	D3034 SDR35	15.300	0.437	11.25	6	6.85	2.00	0.375	1.0	0.375	13.70
	18"	F679 T-1	18.701	0.536	13.50	9	8.37	2.50	0.50	1.5	0.50	16.74
	21"	F679 T-1	22.047	0.632	15.75	9	9.87	3.00	0.50	1.5	0.50	19.74
	24"	F679 T-1	24.803	0.711	18.00	9	11.11	3.50	0.50	1.5	0.50	22.22
	27"	F679 T-1	27.953	0.801	20.25	9	12.52	4.00	0.50	1.5	0.50	25.04
	6"	CL350 D.I.	6.9	0.25	4.50	6	3.04	0.75	0.375	1.0	0.375	6.08
	8"	CL350 D.I.	9.05	0.25	6.00	6	4.06	1.25	0.375	1.0	0.375	8.12

Typical Mandrel Details
No Scale

WARNING!
There are existing water pipelines, underground telephone cables and other above and below ground utilities in the vicinity of this project. The Contractor shall contact all appropriate companies prior to any construction in the area and determine if any conflicts exist. If so, the Contractor shall immediately contact the Engineer who shall revise the design as necessary.

NO.	REVISION	BY	DATE

SJT DESIGNED BY: 8-10-2022 DATE
BLM, SJT DRAWN BY: 8-16-2022 DATE
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STATE OF TEXAS · BRYAN ERIC MOORE · 98920 · LICENSED PROFESSIONAL ENGINEER · 08/24/2023

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SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

WASTEWATER DETAILS (2 OF 2)
for
WOODSIDE WEST - PHASES A & E
GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Project No: 22226-21

SHEET 72 of 93

2023-19-CON