Water Pollution Abatement Plan

and

Organized Sewage Collection System Plan Modification

For

Somerset Hills Phases A-E

In the

City of Georgetown

Williamson County, Texas

Submitted: June 2, 2021

Updated: July 26, 2021

Resubmitted: October 20, 2021

Modification: May 6, 2024

Job Number: 22226x-6A&B

PHONE 512.930.9412
FAX 512.930.9416
STEGER BIZZELL
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
WEB STEGERBIZZELL.COM
TEXAS REGISTERED ENGINEERING FIRM F-181

Water Pollution Abatement Plan
and
Organized Sewage Collection System Plan Modification

For

Somerset Hills Phases A-E

In

City of Georgetown

Williamson County, Texas

Job Number: 22226x-6A&B
Prepared by:

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER

May 6, 2024

STEGER BIZZELL

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

Modification of a Previously Approved 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)
  Attachment B - Stratigraphic Column
  Attachment C - Site Geology
  Attachment D - Site Geologic Map(s)

- **Modification of a Previously Approved Plan (TCEQ-0590)**

  Attachment A - Original Approval Letter and Approved Modification Letters
  Attachment B - Narrative of Proposed Modification
  Attachment C - Current Site Plan of the Approved Project

- **Application Form (include any applicable to the proposed modification):**

  Aboveground Storage Tank Facility Plan (TCEQ-0575)
  Organized Sewage Collection System Application (TCEQ-0582)
  Underground Storage Tank Facility Plan (TCEQ-0583)
  Water Pollution Abatement Plan Application (TCEQ-0584)
  Lift Station / Force Main System Application (TCEQ-0624)

- **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 requested)
  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

- **Permanent Stormwater Section (TCEQ-0600), if necessary**

  Attachment A - 20% or Less Impervious Cover Declaration (if requested for multi-family, school, or small business 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 requested)
Attachment I -Measures for Minimizing Surface Stream Contamination

- **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 will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **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:

- If the technical review has begun your application can be denied/withdrawn, your fees will be forfeited, and the plan will have to be resubmitted.
- 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 denied/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 affected 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.

<table>
<tr><td colspan="3">1. Regulated Entity Name:
Somerset Hills Phases A-E</td><td colspan="6">2. Regulated Entity No.: 111309837</td></tr>
<tr><td colspan="3">3. Customer Name: Furman Tierra, LLC</td><td colspan="6">4. Customer No.: 605798909</td></tr>
<tr><td>5. Project Type:
(Please circle/check one)</td><td colspan="2">New</td><td colspan="3">Modification</td><td colspan="2">Extension</td><td>Exception</td></tr>
<tr><td>6. Plan Type:
(Please circle/check one)</td><td>WPAP</td><td>CZP</td><td>SCS</td><td>UST</td><td>AST</td><td>EXP</td><td>EXT</td><td>Technical Clarification</td><td>Optional Enhanced Measures</td></tr>
<tr><td>7. Land Use:
(Please circle/check one)</td><td colspan="2">Residential</td><td colspan="4">Non-residential</td><td colspan="2">8. Site (acres):</td><td>133.159</td></tr>
<tr><td>9. Application Fee:</td><td colspan="2">$14,500</td><td colspan="4">10. Permanent BMP(s):</td><td colspan="2">Batch Detention Pond/
Vegetative Filter Strips</td></tr>
<tr><td>11. SCS (Linear Ft.):</td><td colspan="2">26,976</td><td colspan="4">12. AST/UST (No. Tanks):</td><td colspan="2">N/A</td></tr>
<tr><td>13. County:</td><td colspan="2">Williamson</td><td colspan="4">14. Watershed:</td><td colspan="2">Berry Creek, Cowan Creek</td></tr>
</table>

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.)	___	___	X
Region (1 req.)	___	___	X
County(ies)	___	___	X
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 _X_ 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. Tyson Hasz, PE - Steger Bizzell
Print Name of Customer/Authorized Agent 5/6/2024
Signature of Customer/Authorized Agent — Date

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: Furman Tierra, LLC / Steger Bizzell, Tyson L Hasz, P.E.

Date: 5/6/2024

Signature of Customer/Agent:

Tyson Hasz

____

Project Information

1. Regulated Entity Name: Somerset Hills Phases A-E
2. County: Williamson
3. Stream Basin: Berry Creek
4. Groundwater Conservation District (If applicable): n/a
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

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

7. Customer (Applicant):

   Contact Person: Albert V. Furman III
   Entity: Furman Tierra, LLC
   Mailing Address: 801 W. 5th St. Apt. 206
   City, State: Austin, TX — Zip: 78703
   Telephone: (512) 924-5526 — FAX: n/a
   Email Address: avfurman@aol.com

8. Agent/Representative (If any):

   Contact Person: Mr. Tyson L Hasz, 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: Tyson.Hasz@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: TRAVELLING NORTH ON I-35, TAKE EXIT 266 TO TX-195 W. FOLLOW TX-195 W FOR APPROXIMATELY 5 MILES. TAKE A LEFT ONTO RATTLESNAKE RD, CONTINUE FOR 0.6 MILES, AND TURN LEFT ONTO RONALD W REAGAN BLVD. CONTINUE STRAIGHT FOR APPROXIMATELY 2 MILES. THE SITE IS LOCATED ON THE RIGHT.

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: 6/7/2024

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:

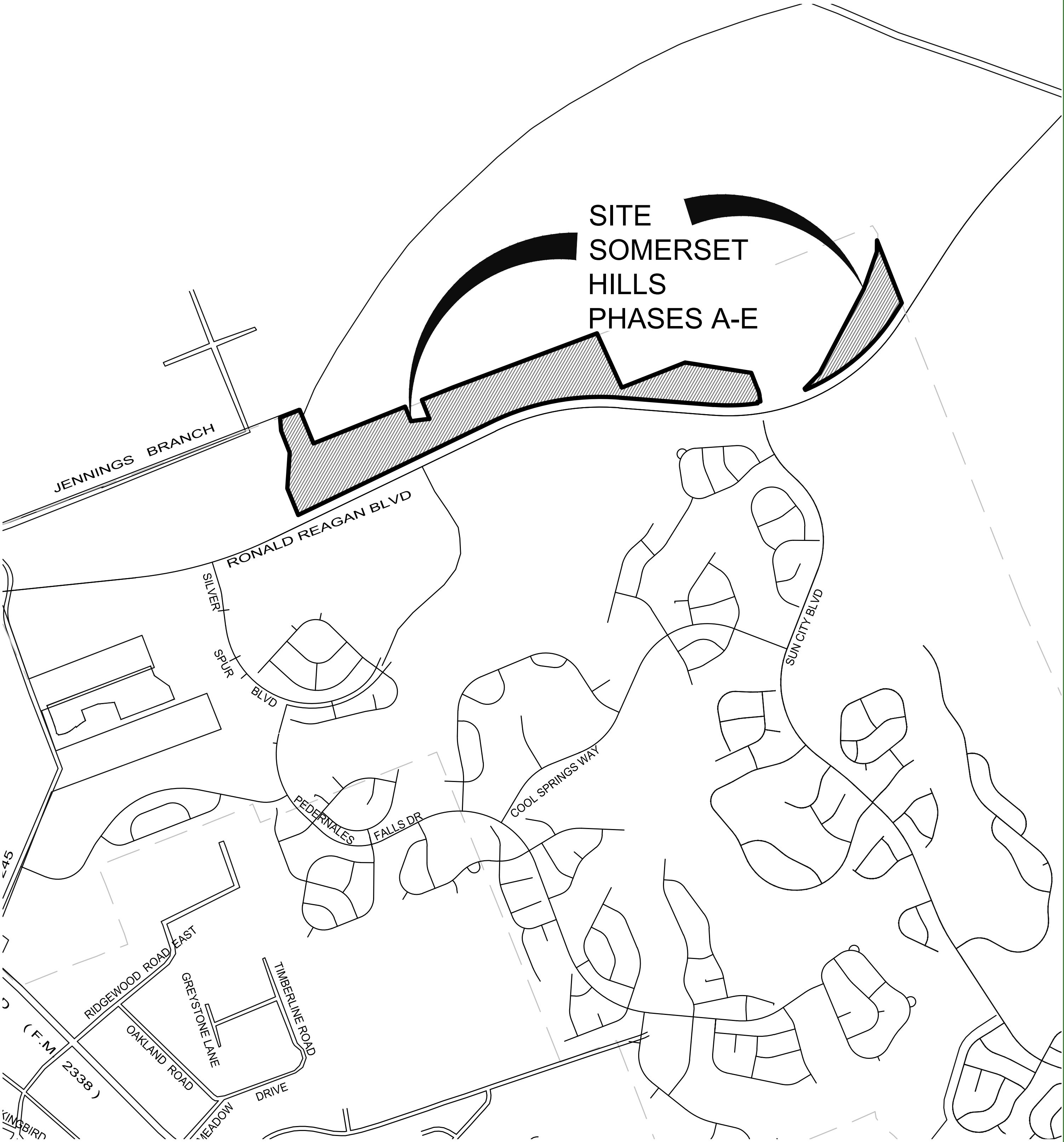
- ☒ For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
- ☒ For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
- ☐ For a UST Facility Plan or Modification or an 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.



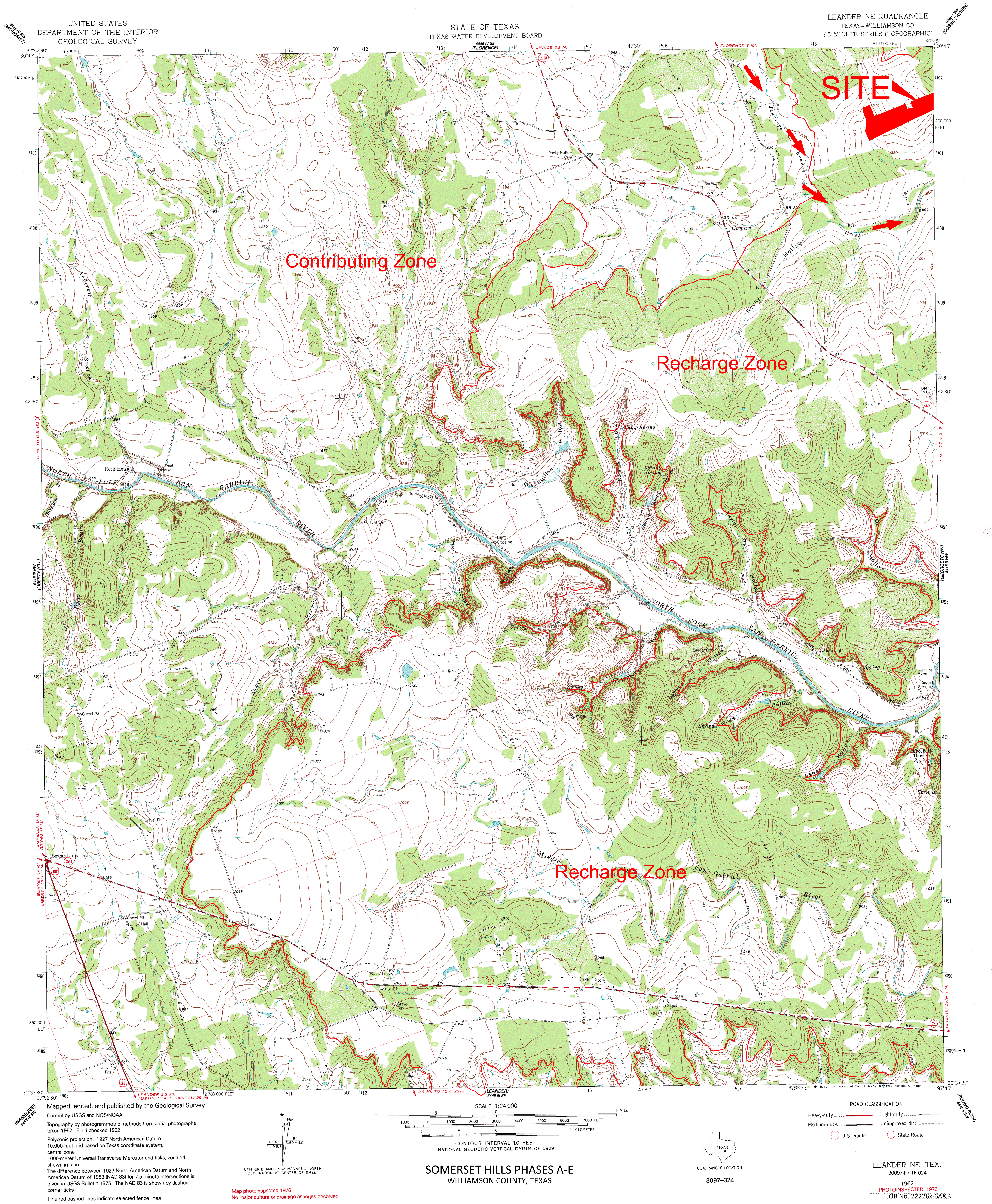
ROAD MAP
ATTACHMENT A
SCALE: 1" = 2000'

STEGER BIZZELL

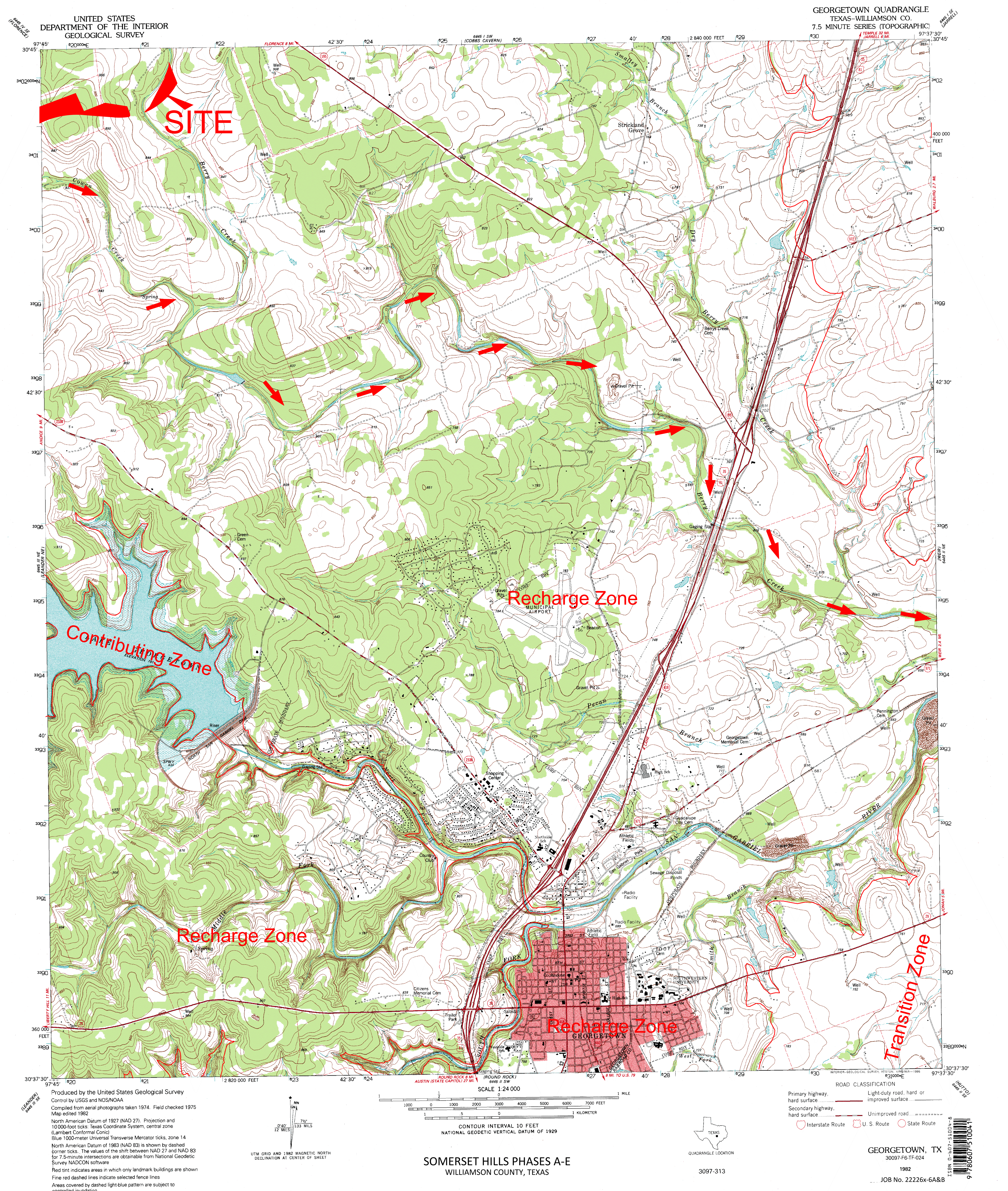
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

JOB NO. 22226X-6A&B 05/06/2024

SOMERSET HILLS PHASES A-E
WILLIAMSON COUNTY, TEXAS



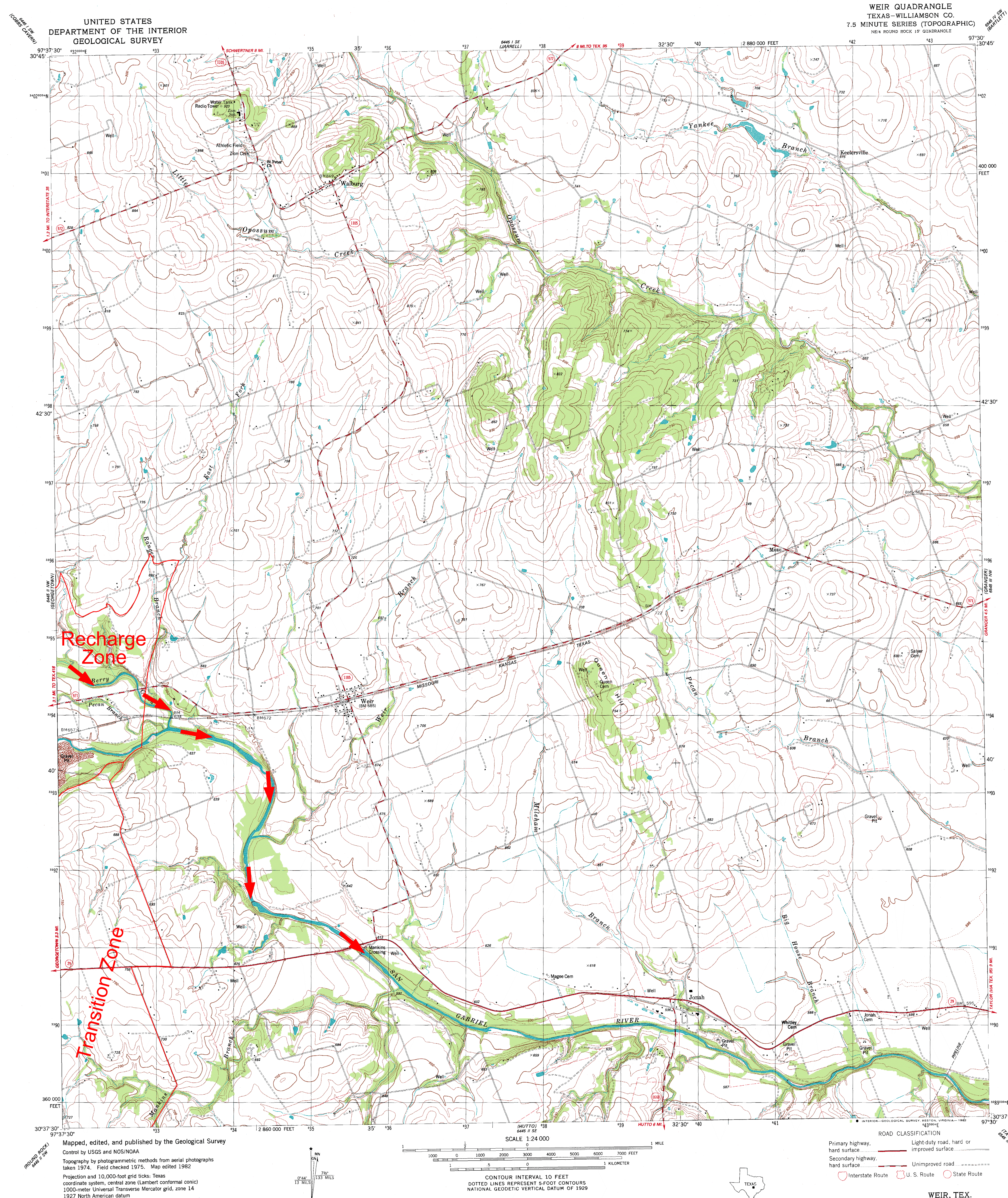
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
STATE OF TEXAS
TEXAS WATER DEVELOPMENT BOARD
LEANDER NE QUADRANGLE
TEXAS-WILLIAMSON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SITE
Contributing Zone
Recharge Zone
Recharge Zone
NORTH FORK SAN GABRIEL RIVER
Middle San Gabriel River
Rocky Hollow Creek
Mapped, edited, and published by the Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1962
Polyconic projection. 1927 North American Datum
10,000-foot grid based on Texas coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 14, shown in blue
The difference between 1927 North American Datum and North American Datum of 1983 (NAD 83) for 7.5 minute intersections is given in USGS Bulletin 1875. The NAD 83 is shown by dashed corner ticks
Fine red dashed lines indicate selected fence lines
Map photoinspected 1976
No major culture or drainage changes observed
SCALE 1:24 000
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
U.S. Route
State Route
SOMERSET HILLS PHASES A-E
WILLIAMSON COUNTY, TEXAS
QUADRANGLE LOCATION
3097–324
LEANDER NE, TEX.
30097-F7-TF-024
1962
PHOTOINSPECTED 1976
JOB No. 22226x-6A&B



SOMERSET HILLS PHASES A-E
WILLIAMSON COUNTY, TEXAS

3097-313

JOB No. 22226x-6A&B



SOMERSET HILLS PHASES A-E
WILLIAMSON COUNTY, TEXAS

TCEQ-0587 Attachment C – Project Description

This project consists of the development of a residential site to be known as Somerset Hills. A sewage collection to serve 384 residential units and 1 amenity center will be built on-site. The sewage collection system (SCS) from Somerset Hills Phases A and B will be connected to the existing four-foot Manhole south of Ronald Reagan Boulevard which was constructed with Sun City NH 69. The sewage collection system from Somerset Hills Phases D and E will be connected to the existing four-foot Manhole along Berry Creek which was constructed with Sun City Neighborhood 32. On-site water quality treatment will also be provided.

The site is 133.16 acres and will be developed in four phases. The neighborhood will have frontage to Ronald Reagan Boulevard to the south. The site is located in Georgetown, Texas and bound by undeveloped lands to the north, east, and west.

The WPAP and SCS applications, which were approved on November 19, 2021, included paving, drainage, water and wastewater, detention and water quality improvements for the neighborhood site. *The project has since been modified by the inclusion of a 50 ft Atmos utility easement along the southern boundary of the site. This has reduced the number of residential lots from 410 units to 384 units and* the linear feet of pipe in the sewer collection system from 27,699 feet to 26,985 feet. *Furthermore, there was an error on the original applications listing the total acreage as 133.08 acres instead of the actual 133.159 acres. The Total Suspended Solids (TSS) Removal spreadsheets were originally completed by parcel* rather than by *project*. As a result, the acreage listed in the TSS Removal spreadsheets for Ponds A, B, and C in Parcel 6 was 113.39 acres, and the acreage listed for Pond D in Parcel 7 was 19.69 acres. It appears this resulted in the final project approval being for 113.39 acres with 42.67 acres of impervious cover (37.6%) rather than the 133.08 acres with 46.67 acres of impervious cover (35.06%) that was intended. ***With the site layout revisions that accompanied the addition of the Atmos easement, we are now applying for approval of 48.34 acres of impervious cover (36.3%) on the 133.16-acre project.***

The proposed wastewater system will consist of a four-inch SDR-26 PVC force main, an eight-inch SDR-26 PVC, and a twelve-inch SDR-26 PVC wastewater gravity line. The sewage collection system from Somerset Hills Phases A and B will be connected to the existing four-foot Manhole south of Ronald Reagan Boulevard that was constructed with Sun City NH 69. (Note: Phase C has been incorporated into Phase B.) The sewage collection system from Somerset Hills Phases D and E will be connected to the existing four-foot Manhole along Berry Creek that was constructed with Sun City Neighborhood 32. The systems 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. A portion of Phase B will be collected by an on-site lift station and sent to the west via force main.

Phase A generally drains from northeast to southwest into Berry Creek. Phase B generally drains from west to east and from south to north to neighboring properties. Phase D generally drains west to east into Berry Creek. Phase E generally drains from southeast to northwest into Berry Creek. Any off-site areas adjacent to the project limits will be diverted around Somerset Hills Phases A-E to be collected as adjacent neighborhoods continue to develop. Four batch detention ponds will be provided on-site to treat the proposed impervious cover. Vegetative filter strips will also be used in some areas to provide treatment and meet City of Georgetown's 85% required removal.

The limit of the Somerset Hills Phases A-E WPAP is 133.16 acres. The proposed impervious cover within the site will be 48.34 acres and 36.3%.

There are two reports included within the Geologic Assessment (GA) section of this WPAP/SCS for the project. The first, prepared by Horizon Environmental Services, Inc dated June 2020, for Somerset Hills Parcels 5, 6 and 7 for the property on the northside of Ronald Reagan Blvd. The WPAP/SCS for this project includes Parcels 6 and 7 only. The recommendations and buffers shown within this GA were made following a Phase II karst survey and reviewed by TCEQ in the field prior to the start of design for the project. The following features from this GA are located within the project limits: F-14 to F-28. There are five features identified as sensitive. Feature F-16 is located in Phase A and requires a minimum 50 feet setback. The remaining four sensitive features are located within Phase E: F-24, F-25, F-26 and F27. F-24 and F-27 require a minimum 50-foot setback. Known caves, F25 and F26, include a protective buffer zone extending 50 feet in all directions from the footprint, plus the watershed catchment up to 200 feet from the footprint. These five sensitive features and their buffers are shown on the Site Plan.

The second GA prepared for the project was done by ACI Consulting, dated May 2021, for the off-site wastewater line extension on the Pulte and Sun City Community Association property. There were no sensitive features located within the GA survey area.

The site is currently undeveloped and has been used for agricultural purposes. There are no demolition activities proposed as a part of this project.

Horizon
Environmental Services, Inc.

GEOLOGIC ASSESSMENT
233-ACRE SOMERSET HILLS PARCELS 5, 6, AND 7
RONALD REAGAN BOULEVARD
GEORGETOWN, WILLIAMSON COUNTY, TEXAS
HJN 200018 GA

PREPARED FOR:
SOMERSET HILLS, LTD
NEWPORT BEACH, CALIFORNIA

PREPARED BY:

HORIZON ENVIRONMENTAL SERVICES, INC.
TBPG FIRM REGISTRATION NO. 50488

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

JUNE 2020

CORPORATE HEADQUARTERS
1507 S Interstate 35 ★ Austin, TX 78741-2502 ★ (512) 328-2430 ★ www.horizon-esi.com
An LJA Company

TABLE OF CONTENTS

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: James Killian   Telephone: 512-328-2430

Date: 4 June 2020   Fax: 512-328-1804

Representing: Horizon Environmental Services, Inc. and TBPG Firm Registration No. 50488
(Name of Company and TBPG or TBPE registration number)

Signature of Geologist:

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

Regulated Entity Name: 233-acre Somerset Hills Parcels 5, 6, and 7, along north side of Ronald Reagan Boulevard, Georgetown, Williamson County, Texas

Project Information

1. Date(s) Geologic Assessment was performed: 15, 20, 21, 24, and 31 January 2020; 19 and 24 February 2020; 1, 2, 7, 8, 13 to 17, 20, 21, 23, and 27 to 30 April 2020, and 1 May 2020.

2. Type of Project:

   ☒ WPAP   ☐ AST
   ☒ SCS   ☐ 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)
Crawford clay, 1-3% slopes (CfB)	D	1 to 2
Eckrant extremely stony clay, 0-3% slopes (EeB)	D	0 to 1
Eckrant-Rock outcrop association, 1-10% slopes (ErE)	D	0 to 1

Soil Name	Group*	Thickness(feet)
Fairlie clay, 1-2% slopes (FaB)	D	2 to 4
Georgetown stony clay loam, 1-3% slopes (GsB)	D	1 to 2

** 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" = 400'
Site Geologic Map Scale: 1" = 400'
Site Soils Map Scale (if more than 1 soil type): 1" = 2000'

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 _____ (#) 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.

Horizon
Environmental Services, Inc.

ATTACHMENT A

GEOLOGIC ASSESSMENT TABLE

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: Somerset Hills Parcels 5, 6, and 7, Georgetown, Williamson Co., TX

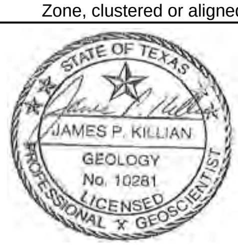
LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	≥40	<1.6	≥1.6	
F-4	30.73708	-97.76594	SC	20	Ked	1	0.5	1.5	--	0	--	--	C,F,O	15	35	X		X		Hillside
F-5	30.74093	-97.76562	SC	20	Ked	0.8	0.3	1.5	--	0	--	--	C,F,O	15	35	X		X		Hillside
F-6	30.73773	-97.76334	SH	20	Ked	14	11	1	--	0	--	--	C,F,O	15	35	X		X		Hillside
F-7	30.73971	-97.76228	SH/C	30	Ked	15	15	23	--	0	--	--	C,F,O	45	75		X	X		Hillside
F-8	30.74087	-97.76221	SH	20	Ked	8	6	1.5	--	0	--	--	C,F,O	25	45		X	X		Hillside
F-9	30.74119	-97.76141	SH/C	30	Ked	7	6	6	--	0	--	--	C,F,O	45	75		X	X		Hillside
F-10	30.74198	-97.76099	SH/C	30	Ked	8	8	9.5	N85E	10	--	--	C,F,O	40	80		X	X		Hillside
F-11	30.742	-97.76028	SH/C	30	Ked	12	12	3.5	--	0	--	--	C,F,O	30	60		X	X		Hillside
F-12	30.74073	-97.76073	SH/C	30	Ked	8	5	4	--	0	--	--	C,F,O	40	70		X	X		Hillside
F-13	30.73893	-97.76088	SC/C	20	Ked	3	3	14	--	0	--	--	C,F,O	55	85		X	X		Hillside
F-14	30.73945	-97.75888	SH	20	Ked	15	6	1.5	--	0	--	--	C,F,O	17	37	X		X		Hillside
F-15	30.74002	-97.75935	SC	20	Ked	3	3	3	--	0	--	--	C,F,O	15	35	X		X		Hillside
F-16	30.740976	-97.756994	SH/SF	20	Ked	8	7	1	--	0	--	--	C,F,O	28	48		X	X		Hillside
F-17	30.741284	-97.755472	SH	20	Ked	12	6	0,5	--	0	--	--	C,F,O	15	35	X		X		Hillside
F-18	30.74002	-97.75935	SH	20	Ked	3	3	3	--	0	--	--	C,F,O	10	30	X		X		Hillside
F-19	30.740976	-97.756994	SF	20	Ked	8	7	1	--	0	--	--	C,F,O	18	38	X		X		Hillside
F-20	30.742814	-97.75239	SH	20	Ked	5	5	0.8	--	0	--	--	C,F,O	10	30	X		X		Hillside

* DATUM: WGS 84

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	Man-made 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: **construction 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 : 4 June 2020

Sheet 1 of 2

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

GEOLOGIC ASSESSMENT TABLE						PROJECT NAME:					Somerset Hills Parcels 5, 6, and 7, Georgetown, Williamson Co., TX									
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	
F-21	30.742814	-97.75118	CD	5	Ked	60	60	1	--	0	--	--	C,F,O	20	25	X		X		Hillside
F-22	30.743263	-97.74849	SC	20	Ked	2	1	1.5	--	0	--	--	C,F,O	15	35	X		X		Hillside
F-23	30.744777	-97.745307	SH	20	Ked	3	3	0.5	--	0	--	--	C,F,O	15	35	X		X		Hillside
F-24	30.74656	-97.73086	SH/SF	20	Ked	6	6	1	N53E	10	--	--	C,F,O	20	50		X	X		Hillside
F-25	30.74787	-97.73112	SH/C	30	Ked	15	12	6	--	0	--	--	C,F,O	40	70		X	X		Hillside
F-26	30.74784	-97.73183	SH/C	30	Ked	8	8	10	--	0	--	--	C,F,O	45	75		X	X		Hillside
F-27	30.7471	-97.7317	SC	20	Ked	5	1.5	4	--	0	--	--	C,F,O	25	45		X	X		Hillside
F-28	30.747118	-97.73182	SH/SF	20	Ked	7	7	1.5	--	0	--	--	C,F,O	15	35	X		X		Hillside
F-29	30.738503	-97.7669	F	20	Ked	8	5	4	N30E	0	--	--	C,F,O	8	38	X		X		Hillside
F-30	30.741108	-97.7761	F	20	Ked	3	3	14	N30E	0	--	--	C,F,O	8	38	X		X		Hillside
M-6	30.74472	-97.74882	MB	30	Ked	2	2	--	--	0	--	--	X	5	35	X		X		Hillside
M-7	30.74473	-97.74858	MB	30	Ked	1500	75	--	--	0	--	--	X	5	35	X		X		Hillside
M-8	30.74558	-97.74588	MB	30	Ked	1000	75	--	--	0	--	--	X	5	35	X		X		Hillside

* DATUM: WGS 84

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	Man-made 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: **construction materials**

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

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.

James P. Killian

Date : 4 June 2020

Sheet ___2___ of __2____

ATTACHMENT B

STRATIGRAPHIC COLUMN

200018 - Somerset Hills Parcels 4-7\Graphics\200018-001GA_05A_Strat.mxd | TED | 02-24-2020

Geologic Unit	Hydrologic Unit	Approx. Thickness at Project Site (ft)
Edwards Formation (Ked)	Edwards Aquifer	120
Comanche Peak Limestone (Kc)	Edwards Aquifer	70
Walnut Formation (Kwa)	Confining Unit	175

Elevation (ft msl)	Depth (ft)
950	0
830	120
760	190
585	365

Note: Unit elevations and thicknesses given with respect to a ground surface elevation of 950 ft msl on the north central property boundary of the subject site.

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

ATTACHMENT B

STRATIGRAPHIC COLUMN
233-ACRE SOMERSET HILLS PARCELS 5, 6, AND 7
RONALD REAGAN BOULEVARD
GEORGETOWN,WILLIAMSON COUNTY, TEXAS

Horizon
Environmental Services, Inc.

ATTACHMENT C

DESCRIPTION OF SITE GEOLOGY

Geologic information for the subject site obtained via literature review is provided in Attachment E, Supporting Information.

A geologic assessment of the approximately 233-acre Somerset Hills Parcels 5, 6, and 7 property was conducted pursuant to Texas rules for regulated activities on the Edwards Aquifer Recharge Zone (EARZ) (30 TAC 213). The subject site consists of unimproved pastureland/rangeland located along the north side of Ronald Reagan Boulevard, Georgetown, Williamson County, Texas. Assessment findings were used to develop recommendations for site construction measures intended to be protective of water resources at the subject site and adjacent areas.

The entire subject site is located within the Edwards Aquifer Recharge Zone (EARZ), as defined by the Texas Commission on Environmental Quality (TCEQ). The EARZ occurs where surface water enters the subsurface through exposed limestone bedrock containing faults, fractures, sinkholes, and caves.

The subject site is predominantly underlain by the undifferentiated Edwards Limestone Formation (Ked), with an estimated maximum thickness of about 120 feet. However, the far western portion of the subject site is underlain by the Comanche Peak Limestone (Kc), with an estimated thickness of up to 70 feet (UT-BEG, 1995). In addition, an overlying thin amount of younger alluvium (Qal) occurs within the southwestern corner of the subject site.

Twenty-seven natural geologic features (F-4 to F-30) and 3 man-made features (M-6 to M-8) were identified at the subject site. Further information pertaining to the geologic and man-made features is presented in Attachments D, E, and F. Photographs of the features are presented in Attachment G.

ATTACHMENT D

SITE GEOLOGIC MAP

Horizon
Environmental Services, Inc.

Date:	02/25/2020
Drawn:	TED
HJN NO:	200018.001 GA
Source:	UT-BEG,1995: Nearmap, 2019

Legend

- Man-Made Features
- Non-sensitive Geologic Features
- Sensitive Geologic Features
- 2-Foot Contours
- Fault
- Alluvium (Qal)
- Edwards Limestone (Ked)
- Comanche Peak Limestone (Kc)
- Subject Site

Attachment D

Site Geologic Map
233-Acre Somerset Hills Parcels 5, 6, and 7
Ronald Reagan Boulevard
Georgetown, Williamson County, Texas

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

0 200 400
Feet
Scale: 1" = 400'

200018 - Somerset Hills Parcels 4-7\Graphics\200018-001GA_06D_SGM.mxd | TED | 02-25-2020

Horizon Environmental Services, Inc.

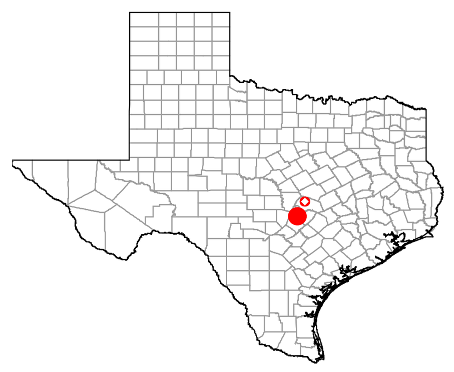
Date:	02/25/2020
Drawn:	TED
HJN NO:	200018.001 GA
Source:	UT-BEG,1995: Nearmap, 2019

Legend

- Man-Made Features
- Non-sensitive Geologic Features
- Sensitive Geologic Features
- Fault
- 2-Foot Contours
- Alluvium (Qal)
- Edwards Limestone (Ked)
- Comanche Peak Limestone (Kc)
- Subject Site

Attachment D

Site Geologic Map
233-Acre Somerset Hills Parcels 5, 6, and 7
Ronald Reagan Boulevard
Georgetown, Williamson County, Texas



STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

0 200 400
Feet
Scale: 1" = 400'

200018 - Somerset Hills Parcels 4-7\Graphics\200018-001GA_06D_SGM.mxd | TED | 02-25-2020

ATTACHMENT E

SUPPORTING INFORMATION

1.0 INTRODUCTION AND METHODOLOGY

This report and any proposed abatement measures are intended to fulfill Texas Commission on Environmental Quality (TCEQ) reporting requirements (TCEQ, 2005). This geologic assessment includes a review of the subject site for potential aquifer recharge and documentation of general geologic characteristics for the subject site. Horizon Environmental Services, Inc. (Horizon) conducted the necessary field and literature studies according to TCEQ *Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones* (TCEQ, 2004).

Horizon walked transects spaced less than 50 feet apart, mapped the locations of features using a sub-foot accurate Trimble Geo HX handheld GPS, and posted processed data utilizing GPS Pathfinder Office software, topographic maps, and aerial photographs. Horizon also searched the area around any potential recharge features encountered to look for additional features. When necessary, Horizon removed loose rocks and soil (by hand) to preliminarily assess each feature's subsurface extent while walking transects. However, labor-intensive excavation was not conducted during this assessment. Features that did not meet the TCEQ definition of a potential recharge feature (per TCEQ, 2004), such as surface weathering, karren, or animal burrows, were evaluated in the field and omitted from this report.

The results of this survey do not preclude the possibility of encountering subsurface voids or abandoned test or water wells during the clearing or construction phases of the proposed project. If a subsurface void is encountered during any phase of the project, work should be halted until the TCEQ (or appropriate agency) is contacted and a geologist can investigate the feature.

2.0 ENVIRONMENTAL SETTING

2.1 LOCATION AND GENERAL DESCRIPTION

The subject site consists of approximately 233 acres of unimproved pastureland/rangeland located along the north side of Ronald Reagan Boulevard (Parcels 5 to 7), Georgetown, Williamson County, Texas (Attachment F, Figure 1).

2.2 LAND USE

The subject site is currently used for agricultural purposes to raise beef cattle. Surrounding lands are generally used for single-family residential and/or rural agricultural purposes.

2.3 TOPOGRAPHY AND SURFACE WATER

The subject site is situated on flat to moderately sloping terrain located within the Berry Creek and Cowan Creek watersheds (Attachment F, Figures 2 and 3). Surface elevations on the subject site vary from a minimum of approximately 840 feet above mean sea level (amsl) at Berry Creek to a maximum of approximately 950 feet amsl near the north-central boundary of the subject site (USGS, 1976 and 1982). Drainage on the site occurs primarily by overland sheet flow in multiple directions depending on proximity to Berry Creek and 2 unnamed tributaries of Berry Creek and Cowan Creek. The tributary of Cowan Creek occurs on the west-central portion of the site while the tributary of Berry Creek occurs on the east-central portion of the subject site.

2.4 EDWARDS AQUIFER ZONE

The entire the subject site is located within the Edwards Aquifer Recharge Zone (EARZ) (TCEQ, 2020) (Attachment F, Figure 2). The Recharge Zone is described as an area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer.

2.5 SURFACE SOILS

Six soil units are mapped within the subject site (NRCS, 2020) (Attachment F, Figure 4). Generally, the soil series are similar in their physical, chemical, and engineering properties, with the principal exception being rock fragment content and thickness. The soil units are described in further detail below.

Crawford clay, 1 to 3% slopes (CfB) is a gently sloping soil found on footslopes and at the heads of drainageways on uplands. Typically, the uppermost layer is neutral clay about 27 inches thick. It is brown in the upper 6 inches and dark reddish-brown below that. The underlying material is whitish, fractured, hard limestone. This soil is well-drained, and the available water capacity is low. When the soil is dry and cracked, permeability is rapid; but when the soil is wet and the cracks are closed, permeability is very slow. Runoff is medium.

Eckrant extremely stony clay, 0 to 3% slopes (EeB) typically has an extremely stony, very dark gray, clay surface layer about 11 inches thick. The underlying material is indurated limestone. About 25% of the surface is covered with fragments of limestone; most are about 6 inches across but range from 3 inches to 3 feet across and are as much as 10 inches thick. The soil is calcareous, moderately alkaline, and well-drained. Permeability is moderately slow, and surface runoff is rapid. The fragments of limestone on the surface help to prevent erosion. The available water capacity is very low because of the shallowness of the soil and stones in the soil.

Eckrant-Rock outcrop complex, rolling (ErE) consists of Eckrant soils and Rock outcrop located along hills, ridges, and on sides of drainageways on uplands. This complex is made up of about 70% Eckrant soils, 15% Rock outcrop, and 15% other soils. Typically, the surface layer of Eckrant soils is calcareous, moderately alkaline, dark grayish-brown, extremely stony clay about 8 inches thick. The underlying material is fractured, indurated limestone. Fragments of limestone from 6 inches to 2 feet across cover about 35% of the surface. Rock outcrop consists of exposed limestone bedrock in narrow bands within areas of Eckrant soils. Loose cobbles and stones on the surface are common. Permeability is moderately slow, and surface runoff is rapid. The available water capacity is very low.

Fairlie clay, 1 to 2% slopes (FaB) is a nearly level soil found on broad plateaus, slightly depressed areas near the heads of drains, and in shallow valleys on uplands throughout the site. Typically, this soil has a dark gray, clay upper layer about 36 inches thick. The layer below that, which extends to about 46 inches, is gray clay. The underlying material, to a depth of 55 inches, is weakly cemented limestone interbedded with limy material. This soil is calcareous and moderately alkaline. This soil is moderately well-drained. When dry, it has wide cracks, and water enters it rapidly. However, when this soil is wet and the cracks are sealed, water enters it very slowly. Surface runoff is slow when this soil is dry and cracked. The available water capacity is high, and erosion is a slight hazard.

Georgetown stony clay loam, 1 to 3% slopes (GsB) is a gently sloping soil that occurs within upland areas. Typically, this soil has a slightly acidic, brown, stony clay loam surface layer about 7 inches thick and few stones on or near the surface. The subsoil, which extends down to a depth of about 35 inches, is neutral, reddish-brown clay in the upper part and slightly acidic, reddish-brown, cobbly clay in the lower part. The underlying material is indurated, fractured limestone that has clay loam in crevices and fractures. This soil is well-drained. Permeability is slow, and surface runoff is medium. The available water capacity is low. Reaction is neutral to slightly acidic. The erosion hazard ranges to slight.

Oakalla soils, 0 to 1% slopes, channeled, frequently flooded (Oc) are found on bottomlands in narrow stream valleys. The bottomlands are dissected by numerous channels that are 2 to 6 feet deep, 10 to 30 feet wide, and 50 to 500 feet apart. The side slopes of the channels range from about 8% in gradient to nearly vertical. Areas of this soil are long and narrow and range up to several acres. These soils are not in a regular pattern. Typically, the surface layer is dark brown loam about 7 inches thick. The layer below that is dark brown clay loam about 16 inches thick. The underlying layer, to 66 inches, is dark brown sandy clay loam. The soil is calcareous and moderately alkaline. These soils are flooded for very brief to brief periods in most years. In most places, a network of small channels feeds into the main stream channel. These channels are the result of the scouring action of floodwater that overflows from the main channel. Soil and gravel have been deposited in many spots, and soil removal is apparently balanced somewhat by soil deposition. The available water capacity is high.

2.6 WATER WELLS

A review of TCEQ and Texas Water Development Board (TWDB) records revealed no water wells on the subject site and 4 wells within 0.5 miles of the subject site (TWDB, 2020). According to the TWDB records, all the off-site wells are reportedly completed within the Trinity Aquifer at total depths ranging from 700 to 800 feet below surface grade.

The results of this assessment do not preclude the existence of undocumented or abandoned wells on the site. If a water well or casing is encountered during construction, work should be halted near the object until the TCEQ is contacted. If any on-site wells are not intended for future use, they should be capped or properly abandoned according to the Administrative Rules of the Texas Department of Licensing and Regulation (TDLR), 16 Texas Administrative Code (TAC), Chapter 76. A plugging report must be submitted by a licensed water well driller to the TDLR Water Well Driller's Program, Austin, Texas. TCEQ publication RG-347, "Landowner's

Guide to Plugging Abandoned Water Wells," provides specific guidance. If a well is intended for use, it must comply with 16 TAC §76.

2.7 GEOLOGY

Literature Review

The subject site is predominantly underlain by the undifferentiated Edwards Limestone Formation (Ked), with estimated maximum thicknesses of about 120 feet. The Edwards Formation consists mostly of gray to light brownish-gray, thin to medium-bedded, dense dolomite, dolomitic limestone, and limestone. The far western portion of the subject site is underlain by the Comanche Peak Limestone (Kc), with an estimated thickness of up to 70 feet (UT-BEG, 1995). In addition, an overlying thin (<10 feet thick) layer of younger alluvium (Qal) (i.e., gravel, sand, silt, and clay) occurs within the southwestern corner of the subject site.

The subject site is located within the Balcones Fault Zone and available geologic reports indicate the nearest mapped faults (F-29 and F-30) bisect near the western and central portions of the site, trending from southwest to northeast. In general, the rock strata beneath the site dip to the east-southeast at about 10 to 30 feet per mile (less than 1°). The site Stratigraphic Column is provided as Attachment B, and the Site Geologic Map is Attachment D.

Field Assessment

A field survey of the subject site was conducted by a licensed Horizon geologist with support staff on 15, 20, 21, 24, and 31 January 2020; 19 and 24 February 2020; 1, 2, 7, 8, 13 to 17, 20, 21, 23, and 27 to 30 April 2020, and 1 May 2020. Horizon identified 27 natural geologic features (F-4 to F-30) at the subject site that meet the TCEQ definition of a potential recharge feature. Also, 3 man-made features (M-6 [water valve], M-7 [water hydrant], and M-8 [sanitary sewer manhole]) were identified at the subject site. Horizon observed no springs and 2 unnamed tributaries at the subject site.

Geologic features identified on the subject site are described as follows:

Geologic Feature F-4: Solution cavity immediately south of existing trail road measuring approximately 1.0 foot long by 0.5 feet wide by 1.5 feet deep with a small, semi-open drainage portal less than 0.5 feet in diameter. Very slight air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks, and/or cobbles down about 2.0 feet below the surface. On 30 April 2020, Horizon staff excavated the feature using a backhoe with hoe ram attachment and did not find any drainage portals and/or voids within the floor or walls of the excavation (~10 feet long by 7 feet wide by 6.5 feet deep). This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-5: Small solution cavity measuring approximately 0.8 feet long by 0.3 feet wide by 1.5 feet deep with a small, semi-open drainage portal less than 0.5 feet in diameter. Slight air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks, and/or cobbles down about 2.0 feet below the surface. On 1 May 2020, Horizon staff excavated the feature using a backhoe with hoe ram attachment and did not find any drainage portals and/or voids within the floor or walls of the excavation (~7 feet long by 6 feet wide by 3.5 feet deep). This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-6: Upland sinkhole in a wooded area measuring approximately 14.0 feet long by 11.0 feet wide by 1.0 foot deep with a semi-open, clay-filled drainage portal about 3.0 inches in diameter near its center. No air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered dense soil, small rocks, and/or cobbles down about 2.0 feet below the surface. On 29 April 2020, Horizon staff excavated the feature using a backhoe with hoe ram attachment and did not find any drainage portals and/or voids within the floor or walls of the excavation (~9 feet long by 7 feet wide by 5 feet deep). This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-7: Upland sinkhole in a thick brushy area measuring approximately 15.0 feet in diameter by 2.0 feet deep that funnels into a fenced, previously excavated pit opening approximately 7.0 feet long by 5.0 feet wide by 23.0 feet deep with additional void opening(s) at the bottom of the pit. Moderate to high air flow conductivity was noted at the opening. This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. This cave has a very high infiltration rate and a surface runoff catchment of less than 1.0 acre. Additionally, this feature is a previously known cave named **Chagas Cave** that was explored, surveyed, and mapped by Mike Warton and Associates (MWA) in August 1994. A copy of the MWA cave map is included in this report.

Geologic Feature F-8: Upland sinkhole measuring approximately 8.0 feet long by 6.0 feet wide by 1.5 feet deep at the head of a thick brushy tributary. A semi-open drainage portal amongst large rocks and cobbles was found near its center with slight air flow conductivity noted at the opening. After limited hand excavation, probing with a steel rod encountered loose rocks and soils down about 2.5 feet below the surface. On 1 May 2020, Horizon staff enlarged/excavated the feature using a backhoe with hoe ram attachment. After excavation, a small (<0.5-inch diameter by 6 to 10 feet deep) but deep drainage portal was found along the floor of the excavation (~10 feet long by 6 feet wide by 4 feet deep). This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-9: Previously excavated fenced pit in thick brushy area measuring approximately 7.0 feet long by 6.0 feet wide by 3.0 feet deep that funnels down into a 3.5-feet-long by 2-feet-wide open portal that stairsteps further down into a low bedding plane void space near its base. Another previously excavated pit is located about 32 feet due east of the sinkhole that measures about 11 feet long by 6 feet wide by 3 feet deep with semi-open drainage portals amongst infilled rock and soils near its base. Moderate air flow conductivity was noted at the fenced excavated opening. This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. This cave has a high infiltration rate and a surface runoff catchment of less than 1 acre. Additionally, this feature is a previously known cave named **Aboreal Cave** that was explored, surveyed and mapped by Mike Warton and Associates (MWA) in August 1994. A copy of the MWA cave map is included in this report.

Geologic Feature F-10: Small upland sinkhole in an open grassy area measuring approximately 8 feet in diameter by 1.5 feet deep that funnels into an open, previously excavated vertical pit about 3 feet in diameter by 9.5 feet deep. A rock was placed partially over the opening. Moderate air flow conductivity was noted at the unfenced excavated opening. This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. This cave has a high infiltration rate and a surface runoff catchment of less than 1 acre. Additionally, this feature is a previously known cave named **Spiny Tortilla Cave** that was explored, surveyed and mapped by Mike Warton and Associates (MWA) in August 1994. A copy of the MWA cave map is included in this report.

Geologic Feature F-11: Upland sinkhole in a wooded thicket measuring approximately 12 feet in diameter by 2 feet deep that funnels into a semi-open, previously excavated (unfenced) opening about 3 feet long by 2.3 feet wide by 1.5 feet deep with an apparent low bedding plane void trending below toward the northeast. Moderate air flow conductivity was noted at the unfenced excavated opening. This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. This cave has an intermediate to high infiltration rate and a surface runoff catchment of less than 1 acre. Additionally, this feature is a previously known cave named **Double Dot Cave** that was explored, surveyed and mapped by Mike Warton and Associates (MWA) in August 1994. A copy of the MWA cave map is included in this report.

Geologic Feature F-12: Small upland sinkhole in a fenced, brushy thicket measuring approximately 8 feet long by 4 to 7 feet wide by 4 feet deep with an open drainage portal about 4 feet in diameter at its base that extends down another 3.5 feet into opposing, low bedding plane voids. Moderate air flow conductivity was noted at the opening. This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. This cave has a high infiltration rate and a surface runoff catchment of less than 1 acre. Additionally, this feature is a previously known cave named **Overlooked Cave** that was explored, surveyed and mapped by Mike Warton and Associates (MWA) in August 1994. A copy of the MWA cave map is included in this report.

Geologic Feature F-13: Previously excavated vertical pit within fenced, thick brushy area measuring approximately 3 feet in diameter by 14 feet deep with a void opening at the northeast side of the pit base. Moderate to high air flow conductivity was noted at the opening. This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. This cave has a very high infiltration rate and a surface runoff catchment of less than 1 acre. Additionally, this feature is a previously known cave named **Pugilist Cave** that was explored, surveyed and mapped by Mike Warton and Associates (MWA) in August 1994. A copy of the MWA cave map is included in this report.

Geologic Feature F-14: Upland sinkhole in an open rocky area measuring approximately 15 feet long by 6 feet wide by 1.5 feet deep with a semi-open, rock and soil filled drainage portal about 0.5 feet in diameter by 1 foot deep near its center. Slight air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered dense soil, small rocks and/or cobbles down about 2.5 feet below the surface. On 28 April 2020, Horizon staff excavated the feature using a backhoe with hoe ram attachment and did not find any drainage portals within the floor of the excavation (~16 feet long by 5 feet wide by 5 feet deep). A very low (<0.5 feet high) epikarstic bedding plane void at 2.5 feet below the surface was found along the northeast wall of the excavation, but it was about 4 feet long and extended only 5 feet toward the northeast. This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-15: Solution cavity measuring approximately 3 feet in diameter by 3 feet deep with very small semi-open drainage portals less than 0.2 feet in diameter along its base with soil and rock infilling. Very slight air flow conductivity was noted at the openings. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks and/or cobbles down about 3.5 feet below the surface. On 28 April 2020, Horizon staff excavated the feature using a backhoe with hoe ram attachment and did not find any drainage portals and/or voids within the floor or walls of the excavation (~7 feet long by 3.5 feet wide by 6 feet deep). This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-16: Small upland sinkhole measuring approximately 8 feet long by 7 feet wide by 1 foot deep with a solution-enlarged fracture drainage portal about 1.5 feet long by 0.3 feet wide by 1 foot deep near its center. Slight to moderate air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered dense soil, small rocks and/or cobbles down about 2 feet below the surface. On 27 April 2020, Horizon staff enlarged/excavated the feature using a backhoe with hoe ram attachment. After excavation, a low bedding plane void (<2 feet high by 6 feet wide) was found about 5 feet below the surface along the southeast wall of the excavation (~7 feet long by 4 feet wide by 8 feet deep). The void extends about 13 feet toward the northeast and slopes into an apparent drainage portal about 2 feet across by less than 0.5 feet high at the northeast corner, but was too small to follow. This feature has a final (negotiated) TCEQ buffer of 50 feet surrounding the excavated sinkhole area, including the adjoining bedding plane void/footprint toward the northeast (~13 feet long by 6 feet wide) This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-17: Upland sinkhole measuring approximately 12 feet long by 6 feet wide by 0.5 feet deep with 3 small open portals less than 0.5 feet in diameter by 0.5 feet deep near its center. Slight air flow conductivity was noted at the openings. After limited hand excavation, probing with a steel rod encountered dense soil, small rocks and/or cobbles down about 2 feet below the surface. On 23 and 27 April 2020, Horizon staff excavated the feature using a backhoe with hoe ram attachment and did not find any drainage portals and/or voids within the floor or walls of the excavation (~6 feet long by 4 feet wide by 3.5 feet deep). This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-18: Upland sinkhole measuring approximately 15 feet long by 11 feet wide by 1 foot deep with 3 small semi-open portals less than 0.5 feet in diameter by 0.5 feet deep near its center. Very slight air flow conductivity was noted at the openings. After limited hand excavation, probing with a steel rod encountered dense soil, small rocks and/or cobbles down about 2 feet below the surface. On 23 April 2020, Horizon staff excavated the feature using a backhoe with hoe ram attachment and did not find any drainage portals and/or voids within the floor or walls of the excavation (~8 feet long by 8 feet wide by 3.5 feet deep). This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-19: Solution-enlarged fracture measuring approximately 1.5 feet long by 0.9 feet wide by 1.5 feet deep with slight air flow conductivity. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks and/or cobbles down about 2 feet below the surface. On 21 and 23 April 2020, Horizon staff excavated the feature using a backhoe with hoe ram attachment and did not find any drainage portals and/or voids within the floor or walls of the excavation (~8 feet long by 7 feet wide by 10 feet deep). This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-20: Small upland sinkhole measuring approximately 5 feet in diameter by 0.8 feet deep within fractured rock outcrop. No air flow conductivity was noted at the fractured openings. After limited hand excavation, probing with a steel rod encountered dense soil, small rocks and/or cobbles down about 1 foot below the surface. This feature has a very low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-21: Closed depression zone approximately 60 feet in diameter consisting of several closed depressions and epikarstic fractures and solution cavities. No air flow conductivity was noted at the cavity and fractured openings. After limited hand excavation, probing with a steel rod encountered dense soil, small rocks and/or cobbles down about 1 foot below the surface. This feature has a very low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-22: Solution cavity measuring approximately 2 feet long by 1 foot wide by 1.5 feet deep. Slight air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks and/or cobbles down about 2 feet below the surface. On 20 and 21 April 2020, Horizon staff excavated the feature using a backhoe with hoe ram attachment and did not find any drainage portals and/or voids within the floor or walls of the excavation (~7 feet long by 6 feet wide by 4 feet deep). This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-23: Small upland sinkhole measuring approximately 3 feet in diameter by 0.5 feet deep with a solutioned opening about 1 foot long by 0.5 feet wide by 1.5 feet deep near its center. Slight air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered dense soil, small rocks and/or cobbles down about 3 feet below the surface. On 17 and 20 April 2020, Horizon staff excavated the feature using a backhoe with hoe ram attachment and did not find any drainage portals and/or voids within the floor or walls of the excavation (~7 feet long by 5 feet wide by 6 feet deep). A second excavation (~7 feet long by 6 feet wide by 5 feet deep) was conducted on an outlying solution cavity feature located about 35 feet due east of the original feature; however, no drainage portals and/or voids were found within the floors or walls of the excavation. This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1acres.

Geologic Feature F-24: Small upland sinkhole measuring approximately 6 feet in diameter by 1 foot deep with 2 intersecting solution-enlarged fractures across the sink (<0.5 feet wide by 1 foot deep). Slight to moderate air flow conductivity was noted at the fracture openings. After limited hand excavation, probing with a steel rod encountered dense soil, small rocks and/or cobbles down about 2 feet below the surface. On 13 and 14 April 2020, Horizon staff enlarged/excavated the feature using a backhoe with hoe ram attachment. After excavation, a small (0.5 feet in diameter by 2 feet deep) drainage portal was found along the floor of the excavation (~8 feet long by 4 feet wide by 10 feet deep). Due to its apparent limited extent, this feature has a final (negotiated) TCEQ buffer of 50 feet surrounding the excavated sinkhole area. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-25: Upland sinkhole near a large oak tree measuring approximately 15 feet long by 12 feet wide by 1 foot deep that funnels into a previously excavated cave that has a locked metal gate (“DNC” engraved letters) over its entrance drop. Below the gate is an opening about 5 feet long by 1 to 2.5 feet wide that offsets and drops a several feet into an apparent bedding plane void. Moderate air flow conductivity was noted at the gated opening. This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. This cave has a high infiltration rate and a surface runoff catchment of less than 1 acre. Additionally, this feature is a previously known cave named **Double Nickel Cave** that was explored, surveyed and mapped by Mike Warton and Associates (MWA) in August 1994. A copy of the MWA cave map is currently not available.

Geologic Feature F-26: Small upland sinkhole in wooded area measuring approximately 8 feet in diameter by 1.5 feet deep that funnels into a previously excavated opening about 3 feet long by 2 feet wide x 10 feet deep with a bedding plane void at its base. A large rock has been partially laid over the pit drop. Moderate to high air flow conductivity was noted at the opening. This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. This cave has a very high infiltration rate and a surface runoff catchment of less than 1 acre. Additionally, this feature is a previously known cave named

Cannibal Lector Cave that was explored, surveyed and mapped by Mike Warton and Associates (MWA) in August 1994. A copy of the MWA cave map is included in this report.

Geologic Feature F-27: Two previously excavated solution cavities spaced about 12 feet apart measuring approximately 5 feet long by 1.5 feet wide by 4 feet deep (the larger solution cavity) and 2 feet long by 1 foot wide by 3 feet deep (the smaller solution cavity). Slight air flow conductivity was noted at the openings. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks and/or cobbles down about 2 feet below the surface. On 15 April 2020, Horizon staff enlarged/excavated the larger cavity feature using a backhoe with hoe ram attachment. After excavation, a very low bedding plane void (i.e., drainage portal ~4 feet long by 3 feet wide by 0.5 feet high) was found near the center of the floor of the excavation (~7 feet long by 5 feet wide by 4.5 feet deep). Due to its apparent limited extent, this feature has a final (negotiated) TCEQ buffer of 50 feet surrounding the excavated area plus 50 feet surrounding the second (smaller) solution cavity located about 12 feet due northwest of the excavation. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres surface.

Geologic Feature F-28: Small upland sinkhole measuring approximately 7 feet in diameter by 1.5 feet deep with 2 intersecting solution-enlarged fractures across the sink (<0.5 feet wide by 2 foot deep). Slight air flow conductivity was noted at the fracture openings. After limited hand excavation, probing with a steel rod encountered dense soil, small rocks and/or cobbles down about 3 feet below the surface. On 15 and 17 April 2020, Horizon staff excavated the feature using a backhoe with hoe ram attachment and did not find any drainage portals and/or voids within the floor or walls of the excavation (~7 feet long by 6 feet wide by 5 feet deep). This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

The Geologic Assessment Table (Attachment A) summarizes this evaluation and assigns the feature's sensitivity a total point value. Features with a point value of 40 or higher are deemed to be sensitive groundwater recharge features and should be protected during site development pursuant to TCEQ rules for protection of the Edwards Aquifer (30 TAC 213).

3.0 CONCLUSIONS AND RECOMMENDATIONS

Twelve geologic features (F-7 to F-13, F16, and F-24 to F-27) have been evaluated as sensitive for groundwater recharge capability and would therefore require a TCEQ protective setback buffer. In general, a protective buffer encompassing a sensitive feature is recommended to meet the TCEQ guidance for a setback of at least 50 feet in all directions from the feature's areal extent (perimeter), plus its watershed catchment up to 200 feet from the perimeter of the feature. However, larger protective buffers for 8 of these features (F-7, F-9, F-10, F-11, F-12, F-13, F-25, and F-26) are recommended to meet the TCEQ guidance for setbacks of 8 known caves (F-7: Chagas Cave, F-9: Arboreal Cave, F-10: Spiny Tortilla Cave, F-11: Double Dot Cave, F-12: Overlooked Cave, F-13: Pugilist Cave, F-25: Double Nickel Cave, and F-26: Cannibal Lector Cave) with mapped subsurface footprints. Caves with a known subsurface footprint (i.e., surveyed/mapped) include a protective buffer zone extending an additional 50 feet in all directions from the footprint, plus the cave's watershed catchment up to 200 feet from the footprint.

A total of 15 geologic features (F-4 to F-6, F-14, F-15, F-17 to F-23, and F-28to F-30) have been evaluated as non-sensitive for groundwater recharge capability and would therefore not require TCEQ protective setback buffers. No further action is recommended for these non-sensitive geologic features. In addition, the man-made features on the site (M-6 to M-8) have been evaluated as non-sensitive for groundwater recharge capability and would therefore not require TCEQ protective setback buffers.

Additionally, no springs were identified within the subject site that would require protection or mitigation pursuant to the City of Georgetown Edwards Aquifer Recharge Zone Water Quality Ordinance No. 2013-59. Of note, if the onsite ephemeral tributaries of Berry Creek and Cowan Creek drain more than 64 acres, these tributaries would also require protection or mitigation pursuant to the City of Georgetown's ordinance.

The site generally appears well-suited to development prospectuses. It should be noted that soil and drainage erosion would increase with ground disturbance. Native grasses and the cobbly content of the soil aid to prevent erosion. Soil and sedimentation fencing should be placed in all appropriate areas prior to any site-disturbing activities.

Because the subject site is located over the Edwards Aquifer Recharge Zone, it is possible that subsurface voids underlie the site. If any subsurface voids are encountered during site development, work should halt immediately so that a geologist may assess the potential for the void(s) to provide meaningful contribution to the Edwards Aquifer.

4.0 REFERENCES

(COA) City of Austin. GIS/Map Downloads, 2012 10-foot Contours. <ftp://ftp.ci.austin.tx.us/GIS-Data/Regional/coa_gis.html>. 8 November 2012.

(Nearmap) Nearmap US, Inc. Nearmap Vertical™ digital orthographic photograph, <https://go.nearmap.com>. Imagery date 3 November 2019.

(NRCS) US Department of Agriculture, Natural Resources Conservation Service. Web Soil Survey, <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Accessed 24 February 2020.

(OSM) OpenStreetMap contributors. OpenStreetMap, <http://www.openstreetmap .org>. Available under the Open Database License (www.opendatacommons.org/ licenses/odbl). Accessed 21 February 2020.

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

________. RG-348, *Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices*. Revised July 2005.

________. Edwards Aquifer Protection Program. Edwards Aquifer Viewer, <http://www.tceq.state. tx.us/field/eapp/viewer.html>. Accessed 21 February 2020.

(TWDB) Texas Water Development Board. TWDB Groundwater Database, <http://www2.twdb.texas.gov/apps/waterdatainteractive/groundwaterdataviewer>. Water Information Integration and Dissemination System. Accessed 24 February 2020.

(USGS) US Geological Survey. 7.5-minute series topographic maps, Leander NE, Texas quadrangle. 1976

________. 7.5-minute series topographic maps, Georgetown, Texas quadrangle. 1982.

UT-BEG) The University of Texas at Austin Bureau of Economic Geology; C.V. Proctor, Jr., T.E. Brown, J.H. McGowen, N.B. Waechter, and V.E. Barnes. *Geologic Atlas of Texas*, Austin Sheet. Francis Luther Whitney Memorial Edition. 1995.

Werchan, L. E., and J. L. Coker. Soil survey of Williamson County, Texas. Soil Conservation Service, US Department of Agriculture, Washington, D.C. 1983.

Double Nickel Cave

Description: Double Nickel Cave is located at the edge of a large open pasture in an area of exposed limestone. The entrance was blocked with rocks but holes allowed entry by raccoons and other small mammals. After removal of rocks it is now an opening 5 ft. long and 1 to 2.5 ft. wide. The entrance is formed along a N 353° W joint. A drop of a few feet leads down a slope into a 2 to 3 ft. high, 30 ft. wide, 60 ft. long flat-floored room, the Raccoon Room. The floor is largely floored with large flat breakdown blocks covered with black topsoil. A 1 to 2.5 ft. high, 5 to 8 ft. wide passage trending N 332° W extends from the Raccoon Room. This passage is floored with small rocks and black topsoil with some clay exposed under the soil. The passage becomes too sediment filled to continue after 45 ft. The cave is a total of 176.8 ft long and the deepest point is 13.7 ft. below the entrance. It was surveyed on 3 May 1994 by Mike Warton & Associates.

Geology: The cave is a minor point recharge feature in the Edwards Limestone, Member No. 1 (Basal Unit).

Biology: The cave was biologically investigated by James Reddell and Marcelino Reyes on 14 April 1994 and 4 October 1994. The cave was moist when visited and has been heavily utilized by raccoons and other small mammals. Decomposing bodies of a raccoon and opossum were present, causing us to cut our initial investigation short. Much of the floor surface is covered with raccoon droppings. The cave contained a large population of cave crickets and other species associated with raccoon droppings and organic matter. The only troglobite found in the cave was the blind spider *Cicurina* (*Cicurella*) sp. and it does not appear to contain habitat for the endangered species. The following fauna was found:

Spiders: *Cicurina* (*Cicurella*) sp.
Cicurina (*Cicurusta*) *varians* Gertsch and Mulaik (troglophile)
Meioneta sp. (troglophile)
Mites: Acarina undetermined
Centipedes: Lithobiomorpha undetermined
Springtails: Collembola undetermined
Slender entotrophs: Campodeidae genus and species
Silverfish: Thysanura undetermined
Cave crickets: *Ceuthophilus* (*Ceuthophilus*) new species (trogloxene)
Ceuthophilus (*Ceuthophilus*) *secretus* Scudder (trogloxene)
Ceuthophilus (*Geotettix*) *cunicularis* Hubbell (trogloxene)
Rove beetles: Staphylinidae genus and species
Wasps: Hymenoptera undetermined

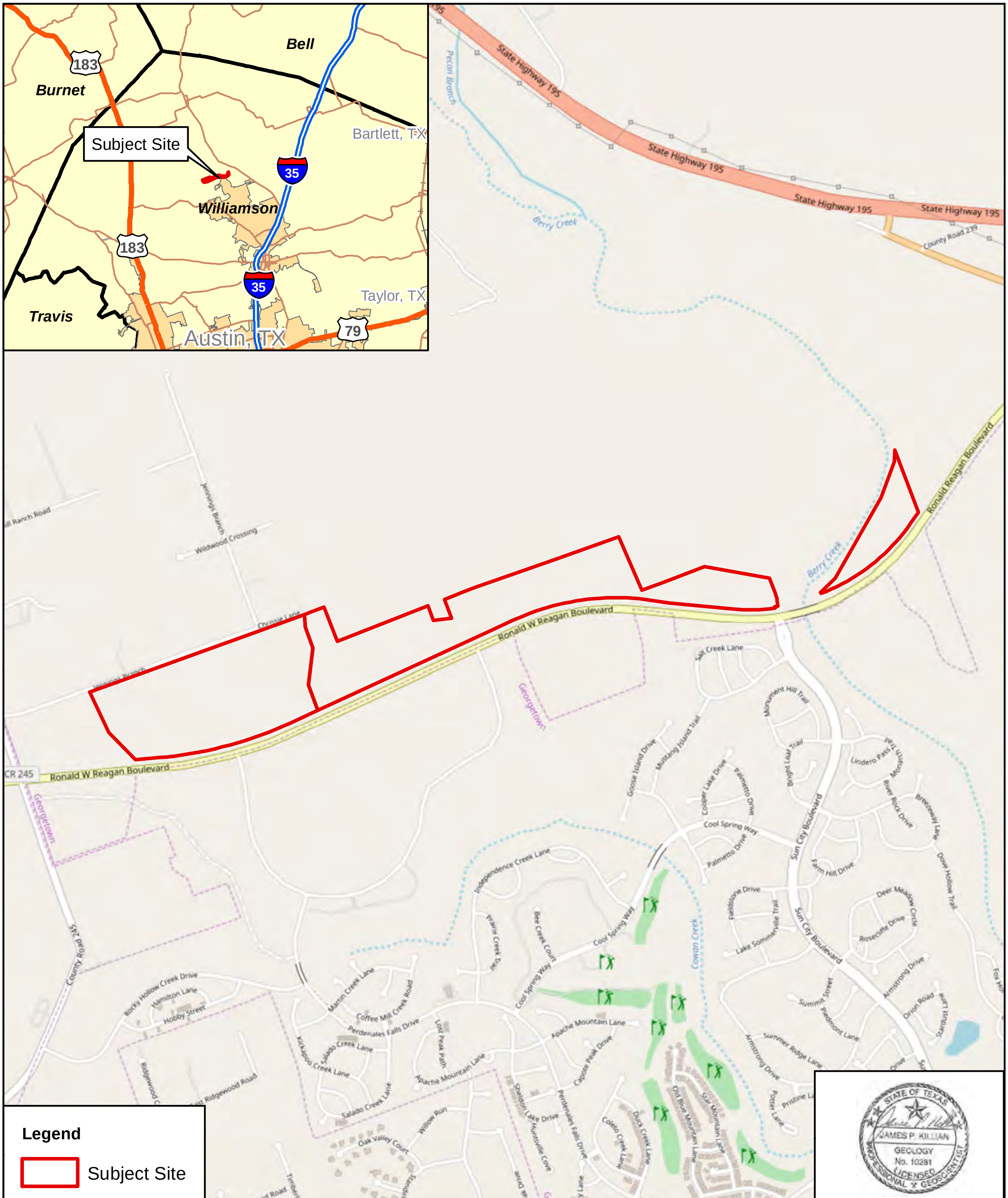
Feather Cave

Description: Feather Cave was filled with sediment and loose rocks, but contained a small drain portal. The entrance is a circular opening about 5 ft. in diameter and 4 ft. deep. It drops into an 8 to 13 ft. wide, 26 ft. long, 1 to 1.5 ft. high chamber. Breakdown blocks occur in some areas. The floor is otherwise covered with black topsoil. Small stalactites occur throughout much of the cave. The deepest point below the entrance and is 4.4 ft. The cave was mapped on 29 April 1994 by Mike Warton & Associates.

Geology: The cave is a minor point recharge feature in the Edwards Limestone, Member No. 1 (Basal Unit).

ATTACHMENT F

ADDITIONAL SITE MAPS



Horizon
Environmental Services, Inc.

Date:	02/11/2020
Drawn:	TED
HJN NO:	200018.001GA
Source:	OSM, 2020

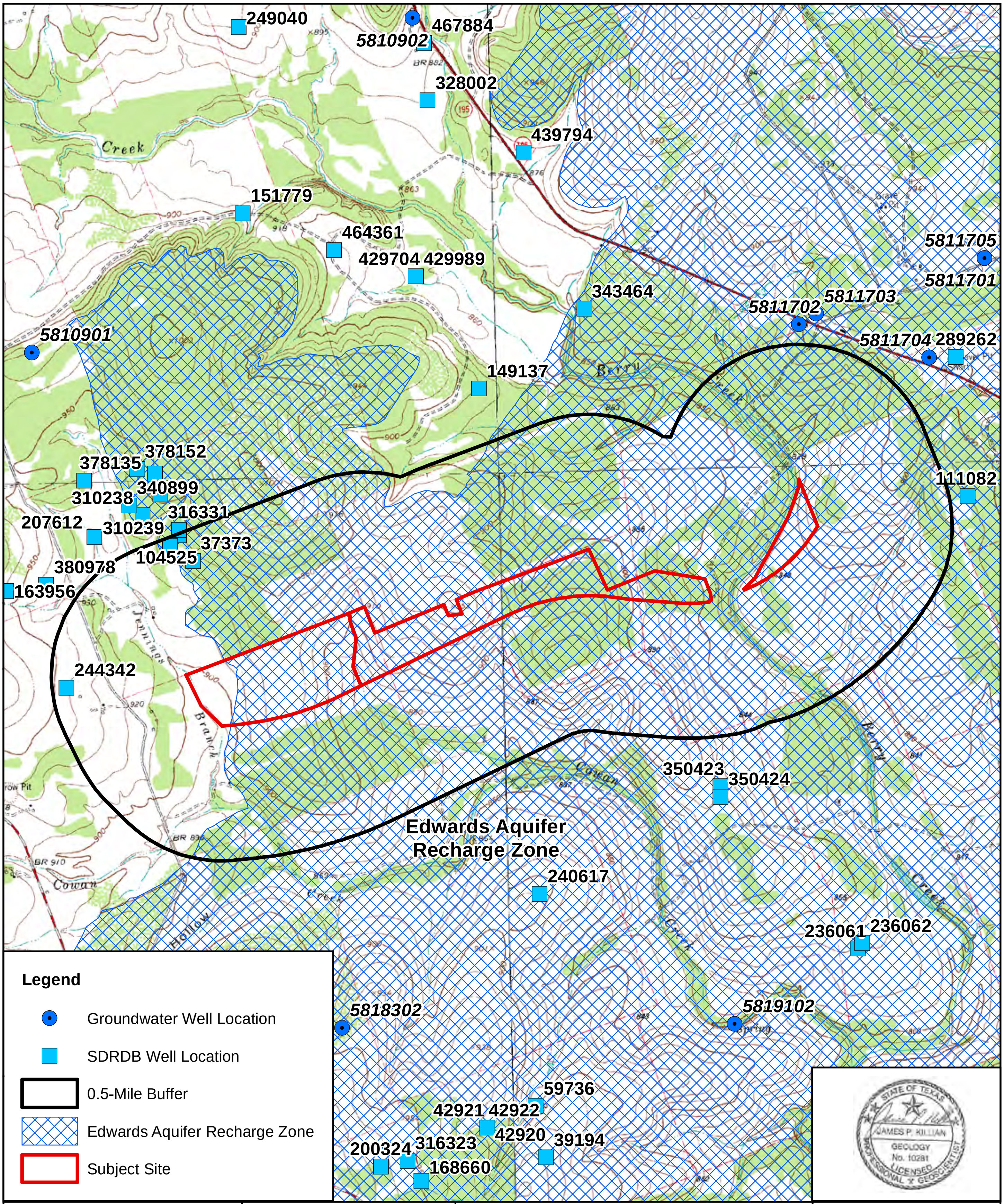
Attachment F, Figure 1

Vicinity Map
233-Acre Somerset Hills Parcels 5, 6, and 7
Ronald Reagan Boulevard
Georgetown, Williamson County, Texas

N

0 1,000 2,000
Feet

200018 - Somerset Hills Parcels 4-7\Graphics\200018-001GA_01A_Vicinity



Horizon Environmental Services, Inc.

Date:	02/11/2020
Drawn:	TED
HJN NO:	200018.001GA
Source:	TCEQ, 2020; TWDB, 2020; USGS, 1976 & 1982

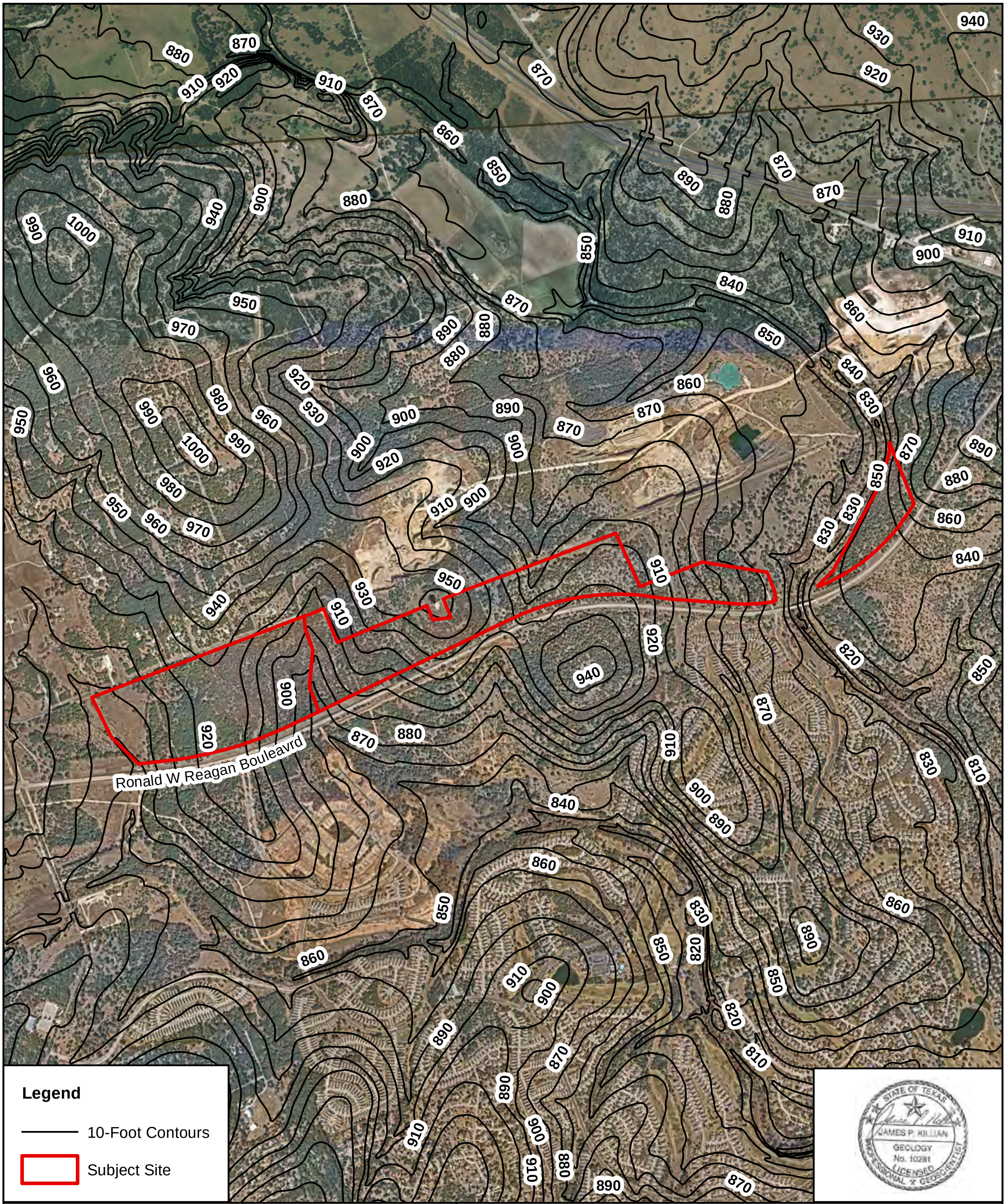
Attachment F, Figure 2

Topography and Hydrogeology Map
233-Acre Somerset Hills Parcels 5, 6, and 7
Ronald Reagan Boulevard
Georgetown, Williamson County, Texas

N

0 1,300 2,600
Feet

190109 - Chisholm Trail\Graphics\190109-001PI_02A_Topo_Hydro



Horizon Environmental Services, Inc.

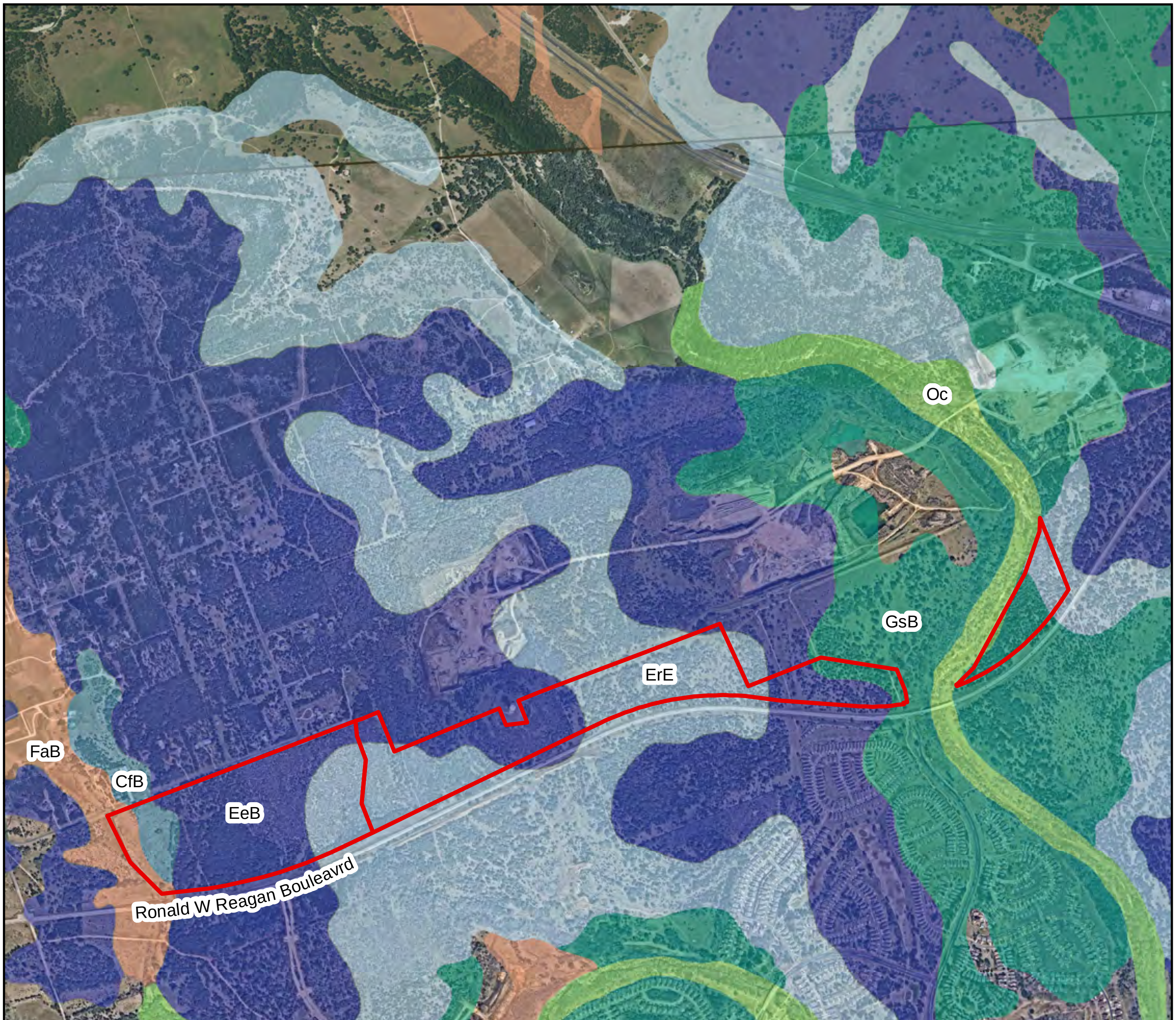
Date:	02/11/2020
Drawn:	TED
HJN NO:	200018.001GA
Source:	COA, 2012; Nearmap, 2019

Attachment F, Figure 3

Site Topography Map
233-Acre Somerset Hills Parcels 5, 6, and 7
Ronald Reagan Boulevard
Georgetown, Williamson County, Texas

0 1,000 2,000
Feet

200018 - Somerset Hills Parcels 4-7\Graphics\200018-001GA_03A_Topo



Legend

- Subject Site
- Crawford clay, 1-3% slopes (CfB)
- Eckrant extremely stony clay, 0-3% slopes (EeB)
- Eckrant-Rock outcrop association, 1-10% slopes (ErE)
- Fairlie clay, 1-2% slopes (FaB)
- Georgetown stony clay loam, 1-3% slopes (GsB)
- Oakalla soils, 0-1% slopes, channeled, frequently flooded (Oc)

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

Horizon Environmental Services, Inc.

Date:	02/11/2020
Drawn:	TED
HJN NO:	200018.001GA
Source:	Nearmap, 2019; NRCS, 2020

Attachment F, Figure 4

Site Soil Map
233-Acre Somerset Hills Parcels 5, 6, and 7
Ronald Reagan Boulevard
Georgetown, Williamson County, Texas

N

0 1,000 2,000
Feet

200018 - Somerset Hills Parcels 4-7\Graphics\200018-001GA_04A_Soil

Horizon
Environmental Services, Inc.

Date:	06/09/2020
Drawn:	KRS
HJN NO:	200018.001 GA
Source:	Nearmap, 2019

Legend

- Man-Made Features
- Non-sensitive Geologic Features
- Sensitive Geologic Features
- Fault
- Cave Footprint
- TCEQ Buffer Area
- Subject Site

Attachment F, Figure 5

Geologic Feature Buffer Map
233-Acre Somerset Hills Parcels 5, 6, and 7
Ronald Reagan Boulevard
Georgetown, Williamson County, Texas

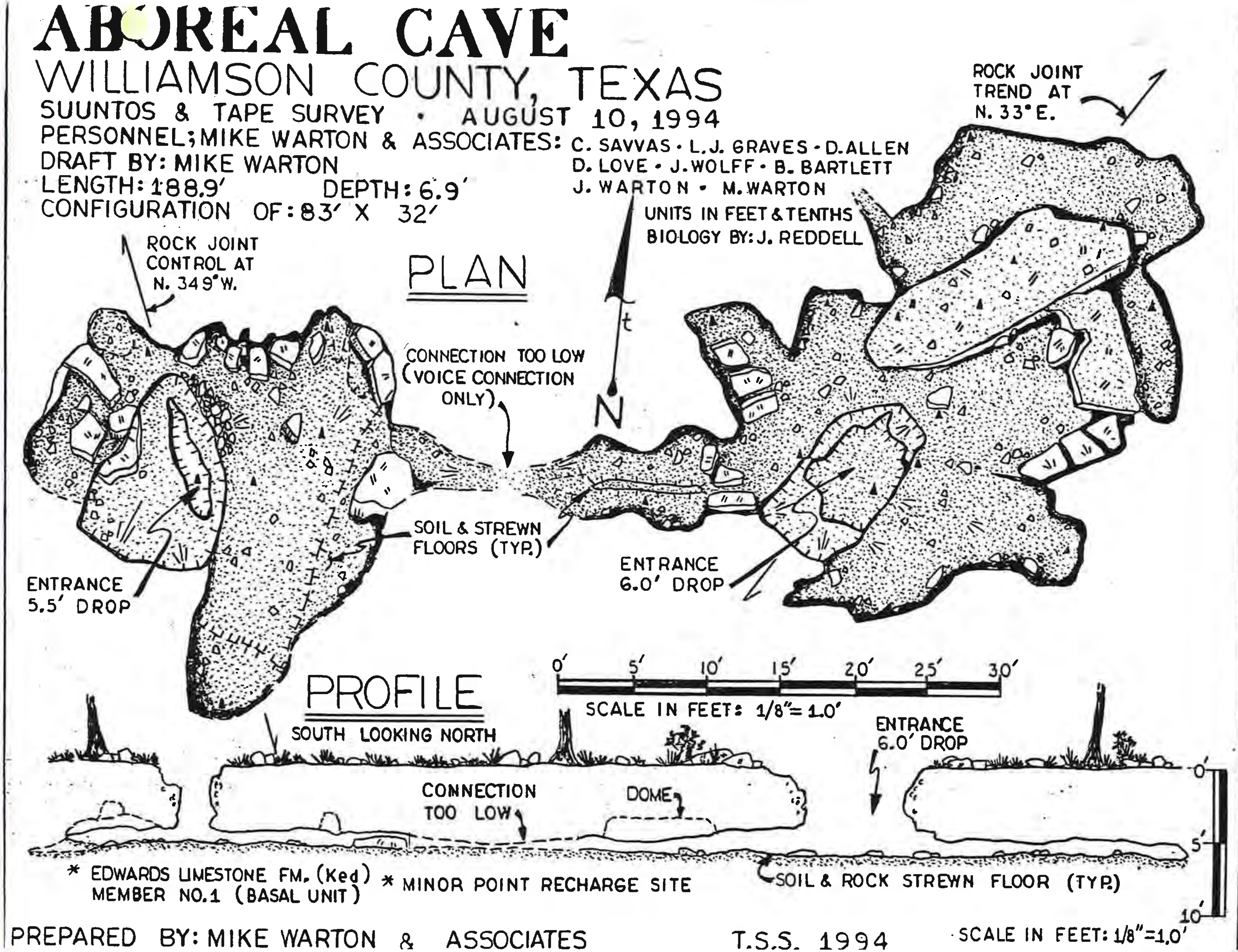
STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

N

0 250 500
Feet

Scale: 1" = 500'

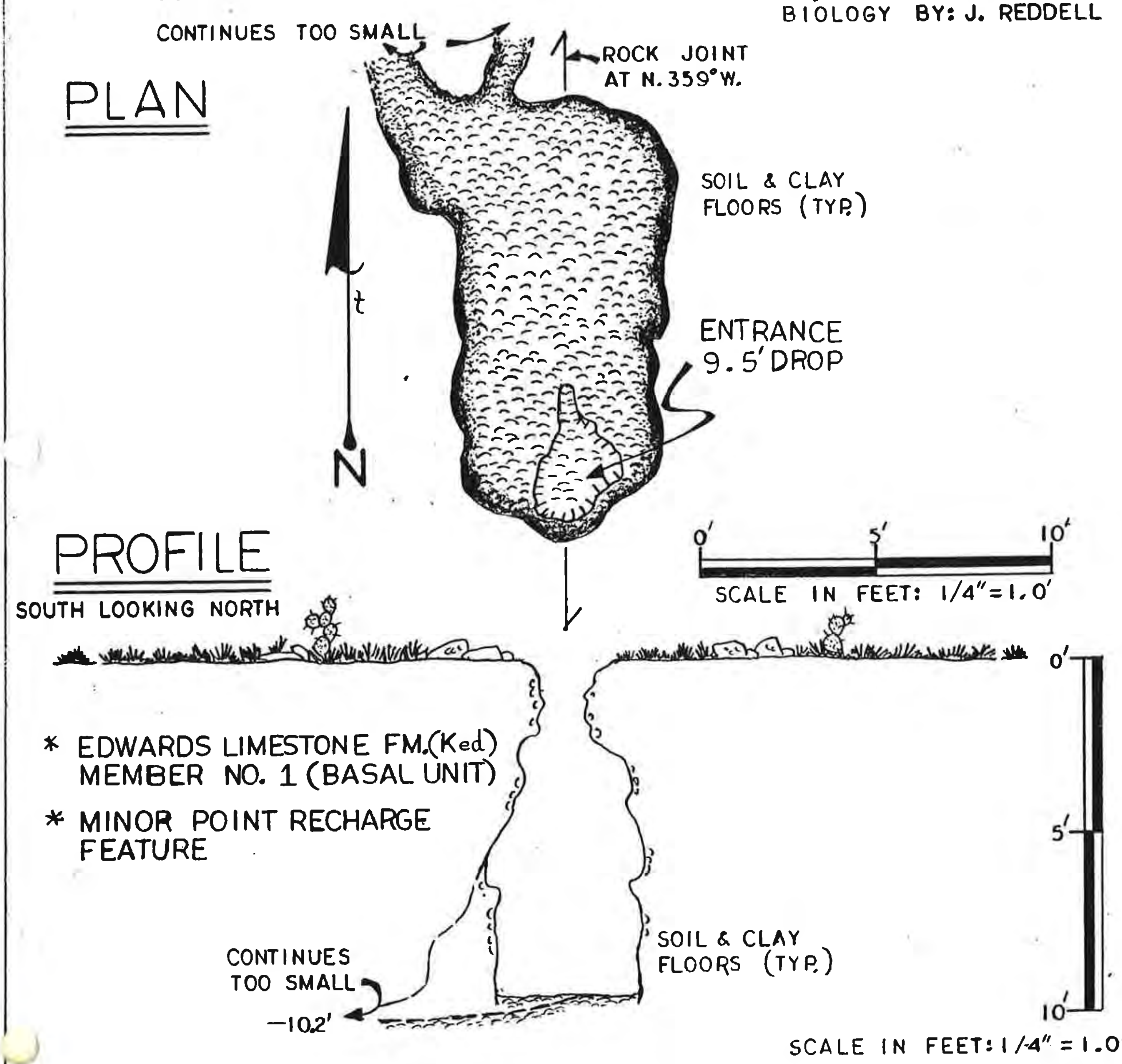
200018 - Somerset Hills Parcels 4-7\Graphics\200018-001GA_07C_Buffers.mxd | KRS | 06-09-2020


ABOREAL CAVE
WILLIAMSON COUNTY, TEXAS
SUUNTOS & TAPE SURVEY • AUGUST 10, 1994
PERSONNEL; MIKE WARTON & ASSOCIATES: C. SAVVAS • L.J. GRAVES • D. ALLEN
D. LOVE • J. WOLFF • B. BARTLETT
J. WARTON • M. WARTON
DRAFT BY: MIKE WARTON
LENGTH: 188.9′ DEPTH: 6.9′
CONFIGURATION OF: 83′ X 32′
UNITS IN FEET & TENTHS
BIOLOGY BY: J. REDDELL
ROCK JOINT TREND AT N. 33° E.
ROCK JOINT CONTROL AT N. 34.9° W.
PLAN
N
t
CONNECTION TOO LOW (VOICE CONNECTION ONLY)
SOIL & STREWN FLOORS (TYP.)
ENTRANCE 5.5′ DROP
ENTRANCE 6.0′ DROP
0′ 5′ 10′ 15′ 20′ 25′ 30′
SCALE IN FEET: 1/8″ = 1.0′
PROFILE
SOUTH LOOKING NORTH
ENTRANCE 6.0′ DROP
CONNECTION TOO LOW
DOME
0′
5′
10′
* EDWARDS LIMESTONE FM. (Ked) MEMBER NO.1 (BASAL UNIT)
* MINOR POINT RECHARGE SITE
SOIL & ROCK STREWN FLOOR (TYP.)
PREPARED BY: MIKE WARTON & ASSOCIATES
T.S.S. 1994
SCALE IN FEET: 1/8″ = 1.0′

CANNIBAL LECTOR CAVE

WILLIAMSON COUNTY, TEXAS

SUUNTOS & TAPE SURVEY • MAY 2, 1994
PERSONNEL; MIKE WARTON & ASSOCIATES: C. SAVVAS • L.J. GPAVES
D. ALLEN • D. LOVE
J. WOLFF • M. WARTON
DRAFT BY: MIKE WARTON
LENGHT: 23.4′ DEPTH: 10.2′
CONFIGURATION OF: 15′ X 8′
UNITS IN FEET & TENTHS
BIOLOGY BY: J. REDDELL

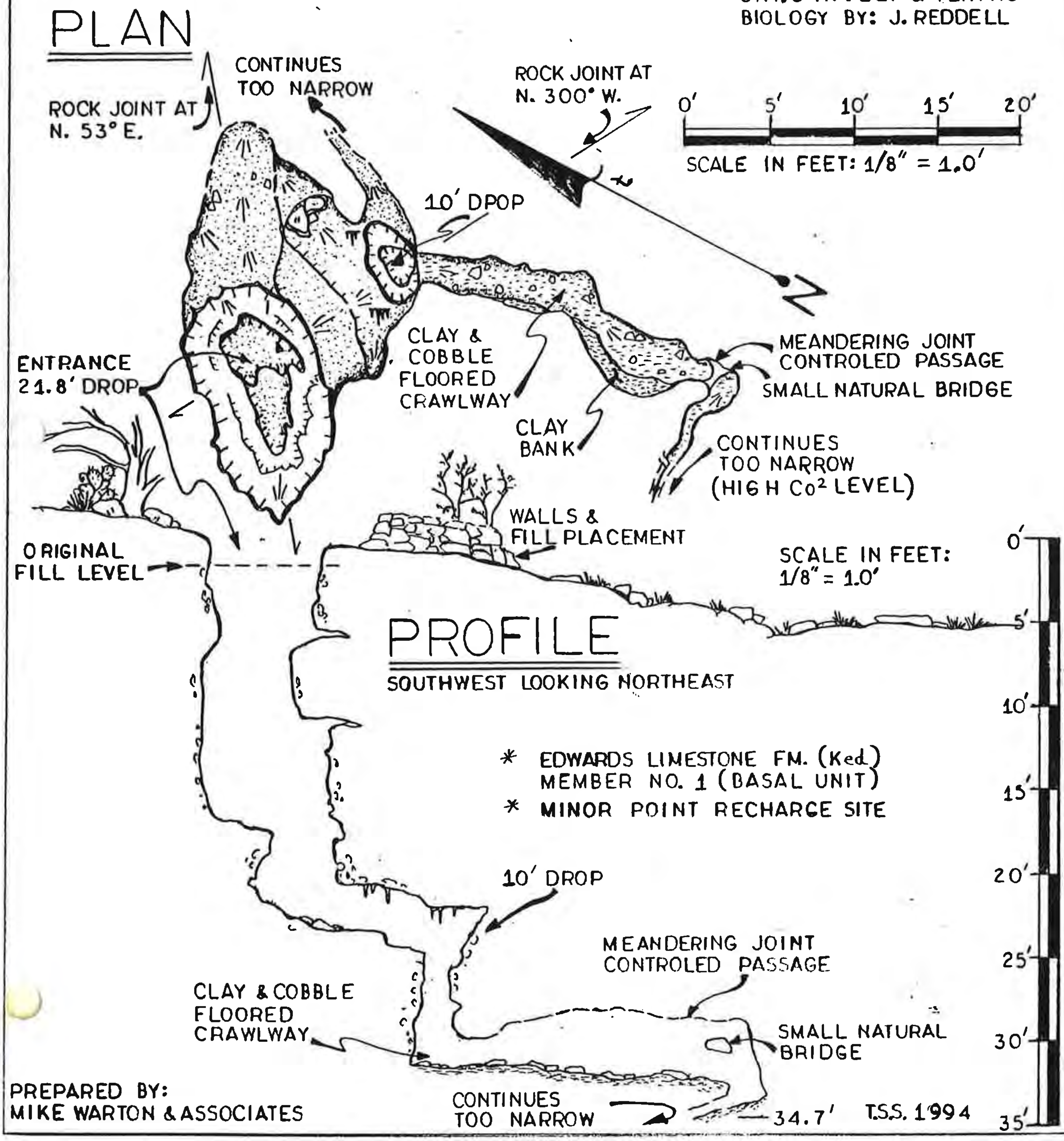


PREPARED BY: MIKE WARTON & ASSOCIATES T.S.S. 1994

CHAGAS CAVE

WILLIAMSON COUNTY, TEXAS

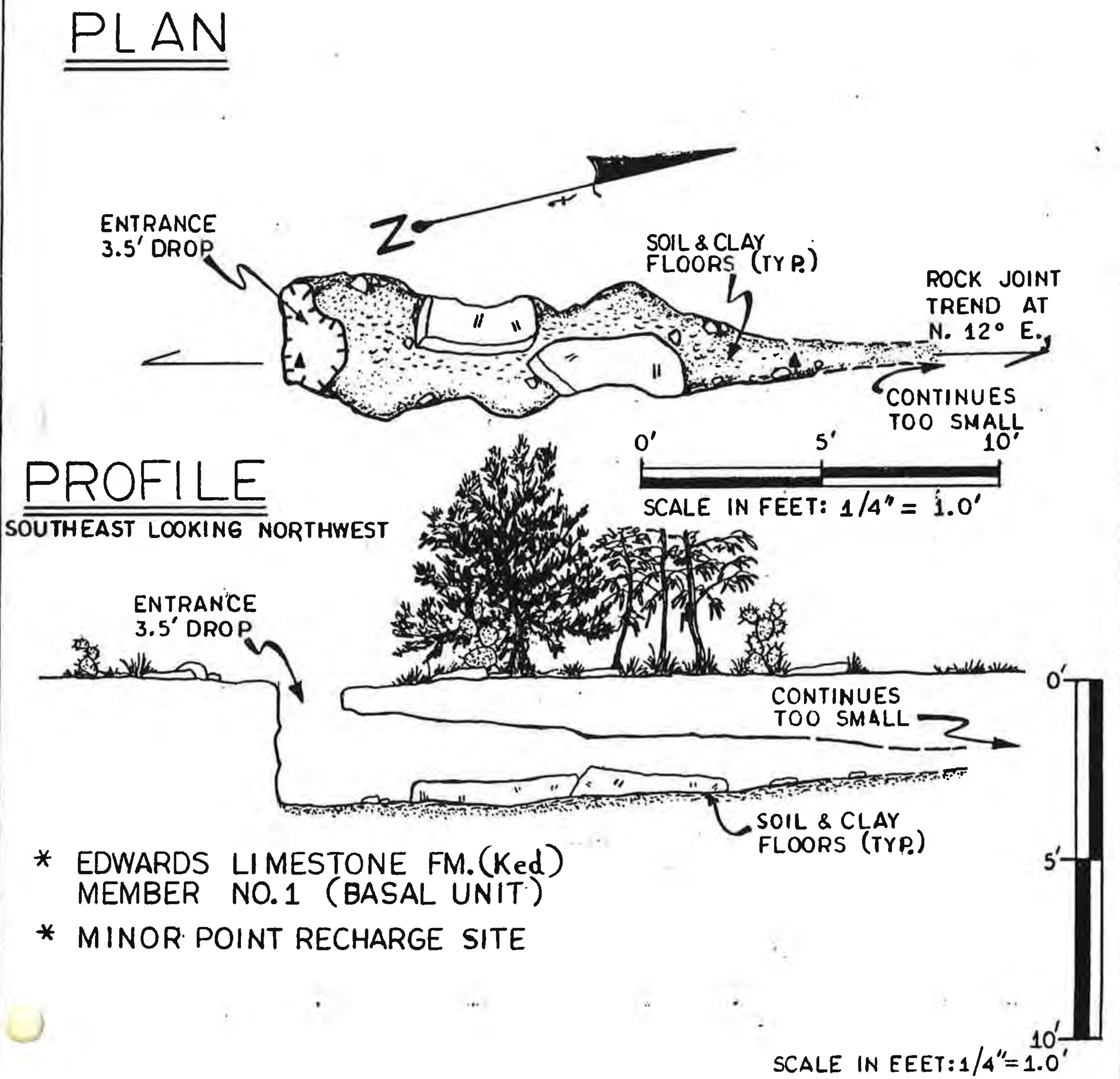
SUUNTOS & TAPE SURVEY • AUGUST 4, 1994
PERSONNEL; MIKE WARTON & ASSOCIATES: C. SAVVAS • L.J. GRAVES
D. ALLEN • D. LOVE
J. WOLFF • B. BARTLETT
J. WARTON • M. WARTON
DRAFT BY: MIKE WARTON
LENGTH: 59.5′ DEPTH: 34.7′
CONFIGURATION OF: 33′ X 24′
UNITS IN FEET & TENTHS
BIOLOGY BY: J. REDDELL



PREPARED BY:
MIKE WARTON & ASSOCIATES

DOUBLE DOT CAVE
WILLIAMSON COUNTY, TEXAS

SUUNTOS & TAPE SURVEY • AUGUST 5, 1994
PERSONNEL; MIKE WARTON & ASSOCIATES: C. SAVVAS • L. J. GRAVES
D. ALLEN • D. LOVE
J. WOLFF • B. BARTLETT
J. WARTON • M. WARTON
DRAFT BY: MIKE WARTON
LENGTH: 18.3′ DEPTH: 3.5′
CONFIGURATION OF: 19′ X 5′
UNITS IN FEET & TENTHS
BIOLOGY BY: J. REDDELL



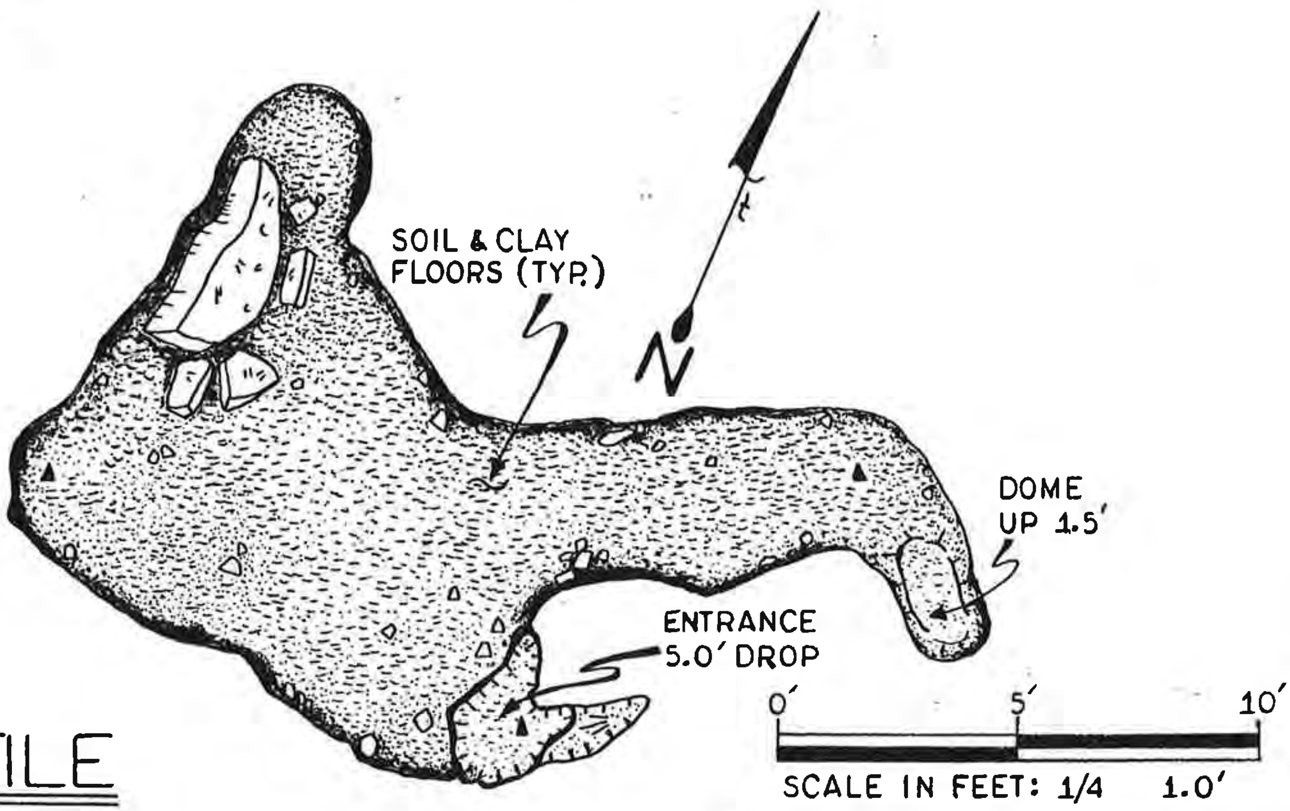
PREPARED BY: MIKE WARTON & ASSOCIATES T.S.S. 1994

OVERLOOKED CAVE

WILLIAMSON COUNTY, TEXAS

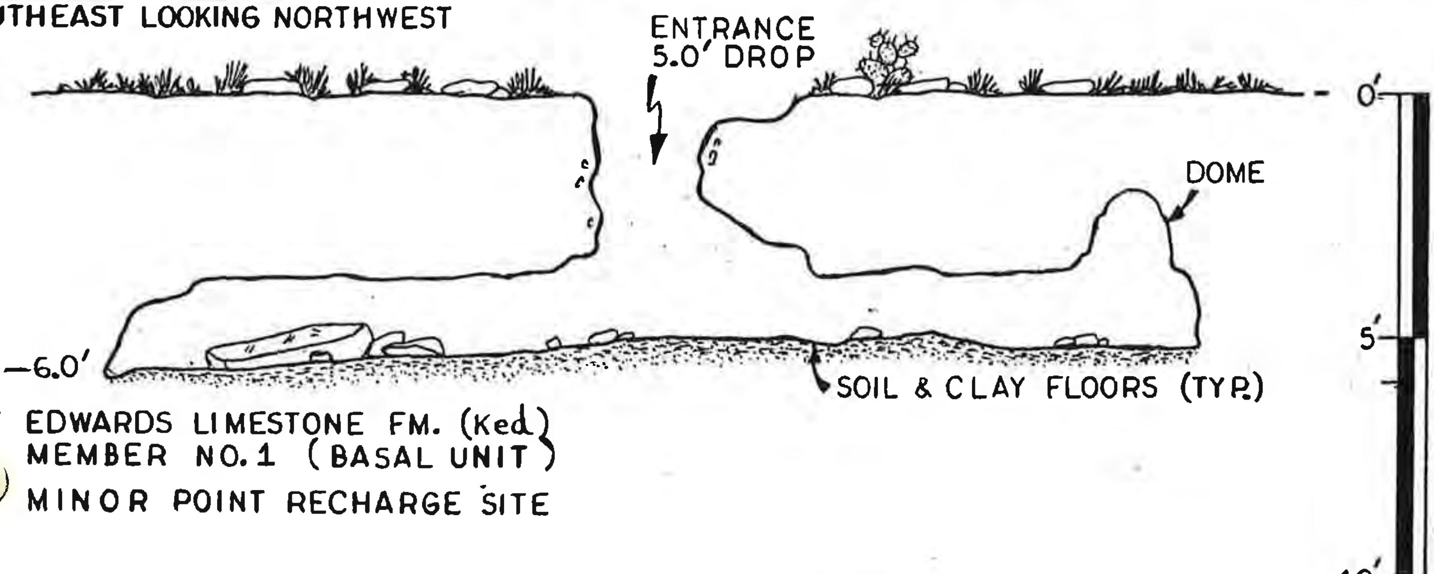
SUUNTOS & TAPE SURVEY • AUGUST 5, 1994
PERSONNEL; MIKE WARTON & ASSOCIATES: C. SAVVAS • L. J. GRAVES
D. ALLEN • D. LOVE
J. WOLFE • B. BARTLETT
J. WARTON • M. WARTON
DRAFT BY: MIKE WARTON
LENGTH: 32.5′ DEPTH: 6.0′
CONFIGURATION OF: 21 X 16′
UNITS IN FEET & TENTHS
BIOLOGY BY: J. REDDELL

PLAN



PROFILE

SOUTHEAST LOOKING NORTHWEST

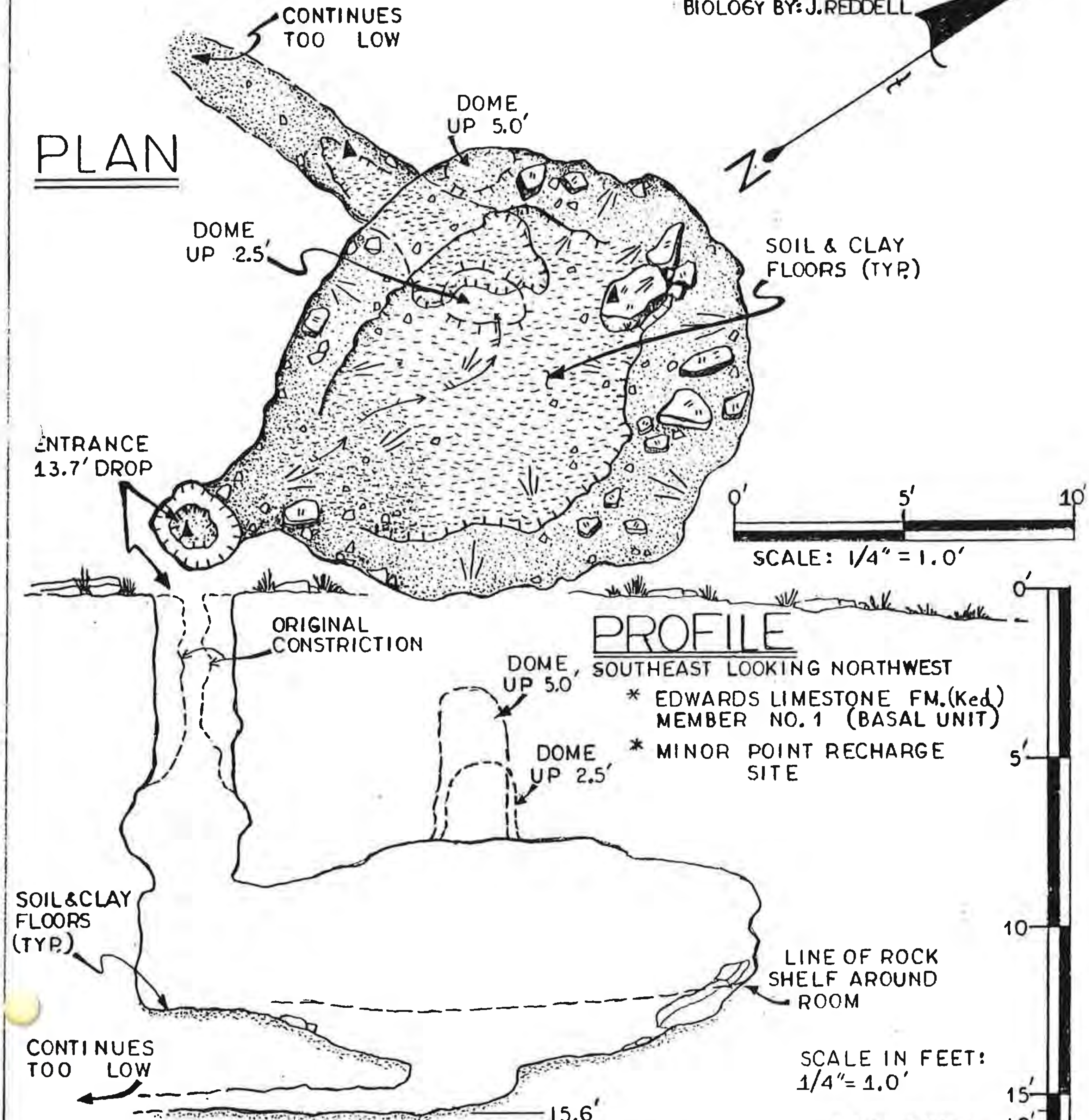


* EDWARDS LIMESTONE FM. (Ked)
MEMBER NO. 1 (BASAL UNIT)
MINOR POINT RECHARGE SITE

PREPARED BY: MIKE WARTON & ASSOCIATES T.S.S. 1994 SCALE IN FEET: 1/4″ = 1.0′

PUGILIST CAVE
WILLIAMSON COUNTY, TEXAS

SUUNTOS & TAPE SURVEY • AUGUST 4, 1994
PERSONNEL; MIKE WARTON & ASSOCIATES: C. SAVVAS • L. J. GRAVES • D. ALLEN • D. LOVE • J. WOLFF • B. BARTLETT • J. WARTON • M. WARTON
DRAFT BY: MIKE WARTON
LENGTH: 45.9′ DEPTH: 15.6′
CONFIGURATION OF: 22′ X 19′
UNITS IN FEET & TENTHS
BIOLOGY BY: J. REDDELL

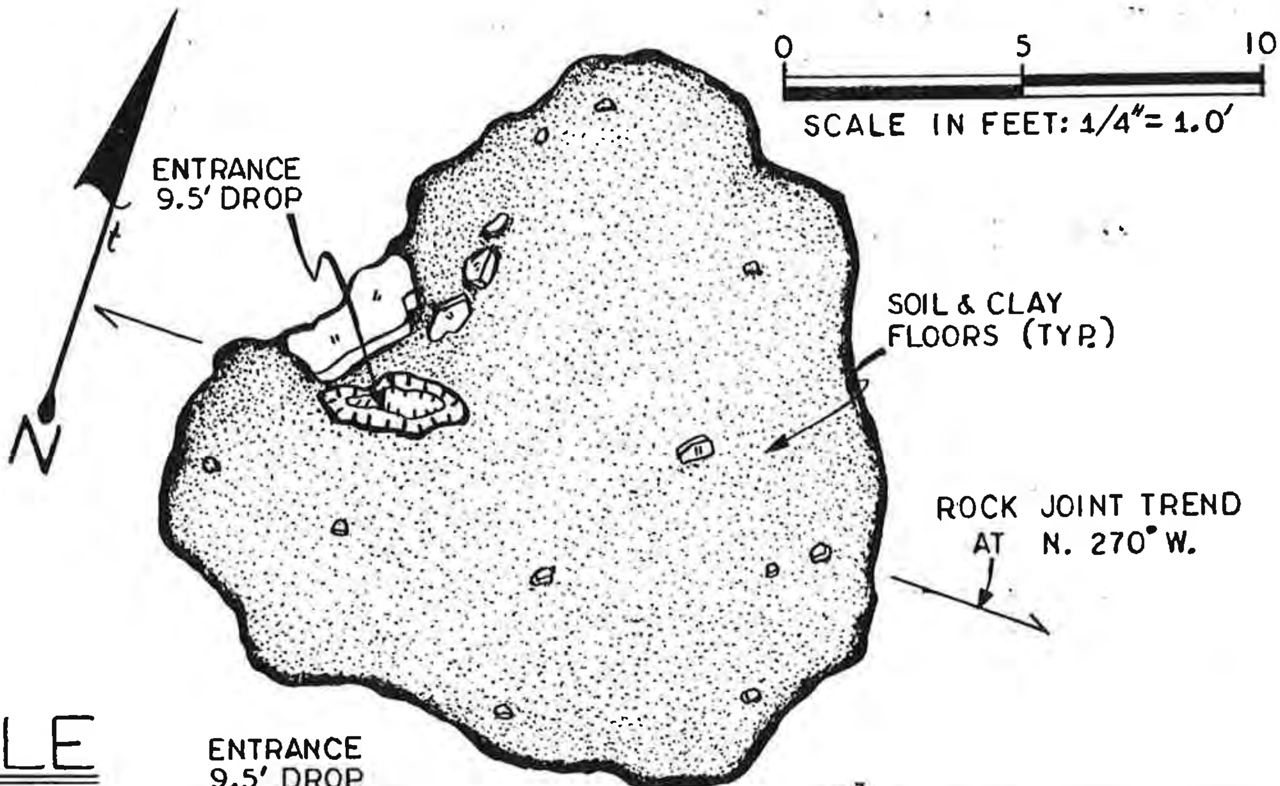


PREPARED BY: MIKE WARTON & ASSOCIATES T.S.S. 1994

SPINEY TORTILLA CAVE

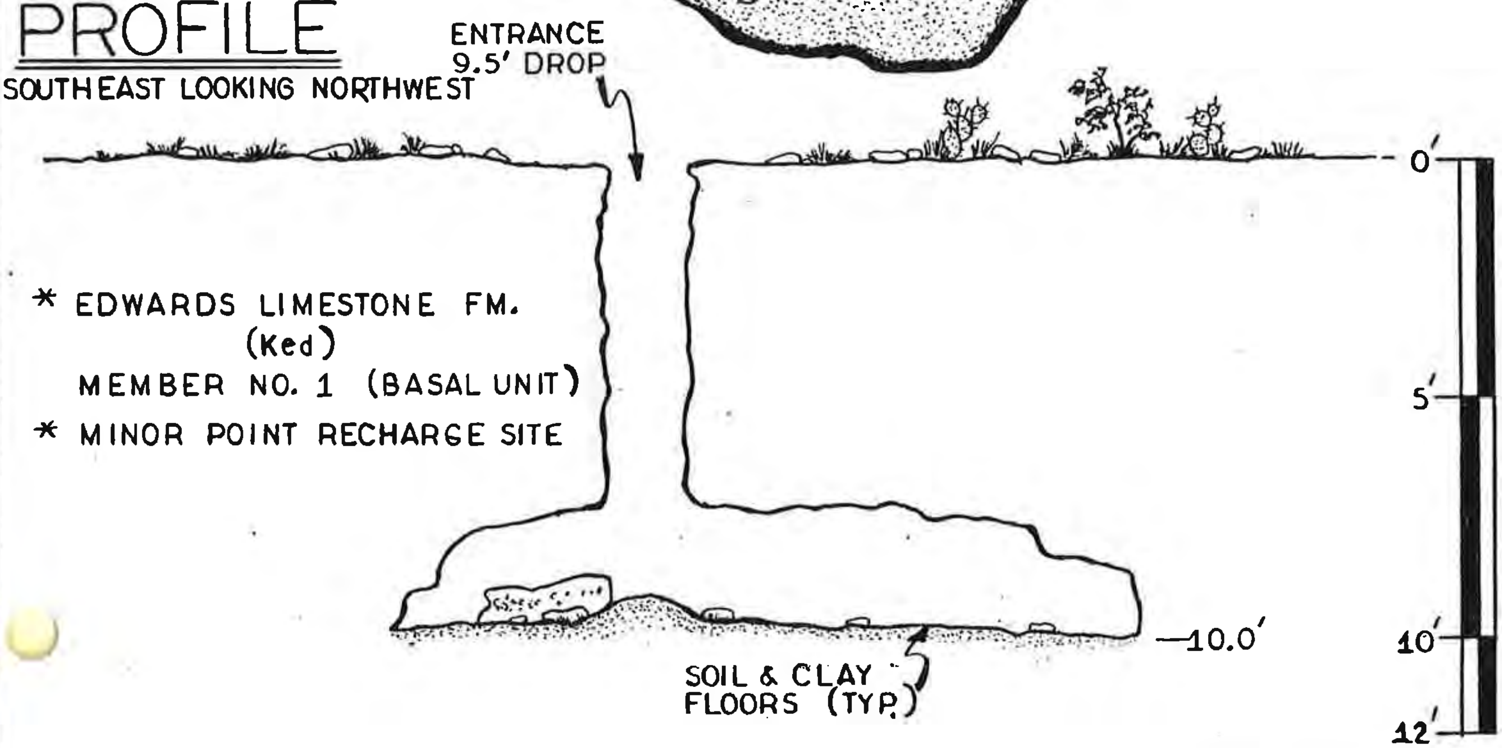
WILLIAMSON COUNTY, TEXAS

SUUNTOS & TAPE SURVEY • AUGUST 5, 1994
PERSONNEL; MIKE WARTON & ASSOCIATES: C.SAVVAS • L.J. GRAVES
D. ALLEN • D. LOVE
J. WOLFF • B. BAPTLETT
J. WARTON • M. WARTON
DRAFT BY: MIKE WARTON
LENGTH: 29.0′ DEPTH: 10.0′
CONFIGURATION OF: 16′ X 15′
UNITS IN FEET & TENTHS
BIOLOGY BY: J. REDDELL



PROFILE

SOUTHEAST LOOKING NORTHWEST



PREPARED BY: MIKE WARTON & ASSOCIATES T.S.S. 1994

Horizon Environmental Services, Inc.

ATTACHMENT G

SITE PHOTOGRAPHS

Horizon
Environmental Services, Inc.

PHOTO 1
View of geologic feature F-4 (solution cavity) after mechanical excavation, facing down

PHOTO 2
View of geologic feature F-5 (solution cavity) after mechanical excavation, facing down

PHOTO 3
View of geologic feature F-6 (upland sinkhole) after mechanical excavation, facing down

PHOTO 4
Geologic feature F-7 (sinkhole/cave) with fencing at previously excavated entrance of Chagas Cave, facing north

PHOTO 5
View down into entrance drop of F-7 (Chagas Cave)

PHOTO 6
View of geologic feature F-8 (upland sinkhole) after mechanical excavation, facing north

PHOTO 7
View of geologic feature F-9 (sinkhole/cave) with fencing at previous excavated entrance of Aboreal Cave, facing northwest

PHOTO 8
View down into entrance drop of F-9 (Aboreal Cave)

Horizon
Environmental Services, Inc.

PHOTO 9
View of infilled shallow pit at F-9 located about 32 feet due east of the fenced sinkhole of another previous excavated entrance drop into Aboreal Cave, facing south

PHOTO 10
View of geologic feature F-10 (small sinkhole/cave) with open (previously excavated) vertical pit drop into Spiny Tortilla Cave, facing north

PHOTO 11
Closer view of entrance drop into F-10 (Spiny Tortilla Cave)

PHOTO 12
View of geologic feature F-11 (sinkhole/cave) with previously excavated area that leads into Double Dot Cave, facing east

Horizon
Environmental Services, Inc.

PHOTO 13
View of geologic feature F-12 (sinkhole/cave) with fenced previously excavated area into Overlooked Cave, facing south

PHOTO 14
Closer view down into F-12 (Overlooked Cave)

PHOTO 15
View of geologic feature F-13 (solution cavity/cave) with fencing around previously excavated area into Pugilist Cave, facing south

PHOTO 16
View down into F-13 (Pugilist Cave)

PHOTO 17
View of geologic feature F-14 (sinkhole) after mechanical excavation, facing north

PHOTO 18
View of geologic feature F-15 (solution cavity) after mechanical excavation, facing north

PHOTO 19
View of geologic feature F-16 (sinkhole/solution-enlarged fracture) after mechanical excavation, facing north

PHOTO 20
View of geologic feature F-17 (sinkhole) after mechanical excavation, facing down

Horizon Environmental Services, Inc.

PHOTO 21
View of geologic feature F-18 (sinkhole) after mechanical excavation, facing west

PHOTO 22
View of geologic feature F-19 (solution-enlarged fracture) after mechanical excavation, facing down

PHOTO 23
View of geologic feature F-20 (sinkhole), facing down

PHOTO 24
View of geologic feature F-21 (closed depression zone)

PHOTO 25
View of geologic feature F-22 (solution cavity) after mechanical excavation, facing south

PHOTO 26
View of geologic feature F-23 (sinkhole) after mechanical excavation, facing northwest

PHOTO 27
View of geologic feature F-24 (sinkhole/solution-enlarged fractures) after mechanical excavation, facing down

PHOTO 28
View of geologic feature F-25 (sinkhole/cave) with gated entrance on top Double Nickel Cave, facing west

PHOTO 29
Close up view of locked cave gate at F-25 (Double Nickel Cave (DNC))

PHOTO 30
View of geologic feature F-26 (sinkhole/cave) with large rock covering entrance into Cannibal Lector Cave, facing southwest

PHOTO 31
View of geologic feature F-27 (2 solution cavities) after mechanical excavation, facing southwest

PHOTO 32
View of geologic feature F-28 (sinkhole/solution-enlarged fractures) after mechanical excavation, facing west

This Page Left Intentionally Blank

aci
consulting
austin • denver

GEOLOGIC ASSESSMENT
FOR THE
SOMERSET HILLS SUBDIVISION PHASES A-E

Williamson County, Texas

May 2021

Submitted to:
Steger Bizzel
1978 South Austin Avenue
Georgetown, Texas 78626

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

aci project #: 22-21-020

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: 5/7/2021 Fax: (512) 306-0974

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

Signature of Geologist:

____

Regulated Entity Name: Somerset Hills Subdivision Phases A-E

Project Information

1. Date(s) Geologic Assessment was performed: 4/26/2021
2. Type of Project:

   ☐ WPAP ☐ AST
   ☒ SCS ☐ 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)
GsB	D	3.33
Ola	B	5 +

** 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" = 300'

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 _____ (#) 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.

aci consulting
austin • denver

TABLE OF CONTENTS

LIST OF ATTACHMENTS

May 2021

Geologic Assessment for the Somerset Hills Subdivision Phases A-E located in Williamson County, Texas

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 Somerset Hills Subdivision Phases A-E, hereafter referred to as the subject area or site, is located approximately .01 mile east and southeast of the intersection at Ronald Reagan Blvd. and Sun City Blvd. in the extraterritorial jurisdiction (ETJ) of Georgetown, Williamson County, Texas (**Attachment A, Figure 1**). Pedestrian investigations of the wastewater alignment were performed on April 26, 2021, by Marcos Cardenas, Sarah King, and Erin Wilson, under the supervision of Mark Adams, P.G. with **aci consulting**.

This report is intended to satisfy the requirements for a Geologic Assessment, which shall be included as a component of a Sewage Collection System Plan (SCS). The site is approximately 0.41 miles in length, however the survey area consisted of an 80-ft buffer around the alignment, comprising a subject area of 8.42 acres. The proposed site use is for a sewage collection system. 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.

<u>Soils</u>

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

- 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. This soil does not meet the criteria for hydric soils. Hydrologic Soil Group: D.

- OlA—Oakalla soils, 0 to 1 percent slopes, channeled, frequently flooded

The Oakalla, channeled component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on channeled flood plains on dissected plateaus. The parent material consists of loamy alluvium derived from limestone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. This soil does not meet the criteria for hydric soils. Hydrologic Soil Group: B.

<u>Geologic Stratigraphy</u>

According to the Geologic Map of the Georgetown Quadrangle, Texas, one geologic unit occurs within the project alignment (**Attachment A, Figure 3**). This unit and a description by Collins (1997) are as follows:

- 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, 1997)
Edwards Limestone	Edwards Limestone	0-100 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 10° to 40° are considered "on trend" and were awarded the additional 10 points in the Geologic Assessment Table. T

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

Historic aerial photographs were reviewed for 1941, 1953, 1964, 1970, 1981, 1988, 1995, 2004, 2008, 2012, and 2016. It was determined that ranching and agricultural activities occurred on the site since the first aerial image dated 1941. The 1953 aerial reveals land modifications and clearing of trees and other vegetation on site for agricultural purposes. The site begins to appear more vegetated by the 1981 aerial photo. Unpaved roads are constructed across the site by the 2004 aerial photo. The 2008 aerial imagery reveals that substantial clearing and land modifications have occurred since 2004. Evidence of surface disturbance from the use of heavy machinery was noted during site reconnaissance in the form of time-worn stumps, piles of rock and soil, and scratches and fractures in limestone slab. The 2012 aerial imagery shows construction of Ronald Raegan Blvd. adjacent to the site, this road is completed by the 2016 aerial. No other obvious change occurs to the land following the clearing event observed in the 2008 aerial. Aerial photographs can be found in **Attachment C**.

5.0 SUMMARY OF FINDINGS

This report documents the findings of a geologic assessment conducted by **aci consulting** personnel on April 26, 2021. No karst features or manmade features in bedrock were encountered during site investigations. **aci consulting** does not have any recommendations as there were no karst features or manmade features in bedrock identified during site investigations.

6.0 REFERENCES

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

(SCS) Soil Conservation Survey. 1983. Soil Survey of Williamson County, Texas. United States Department of Agriculture. Texas Agriculture Experiment Station.

(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.

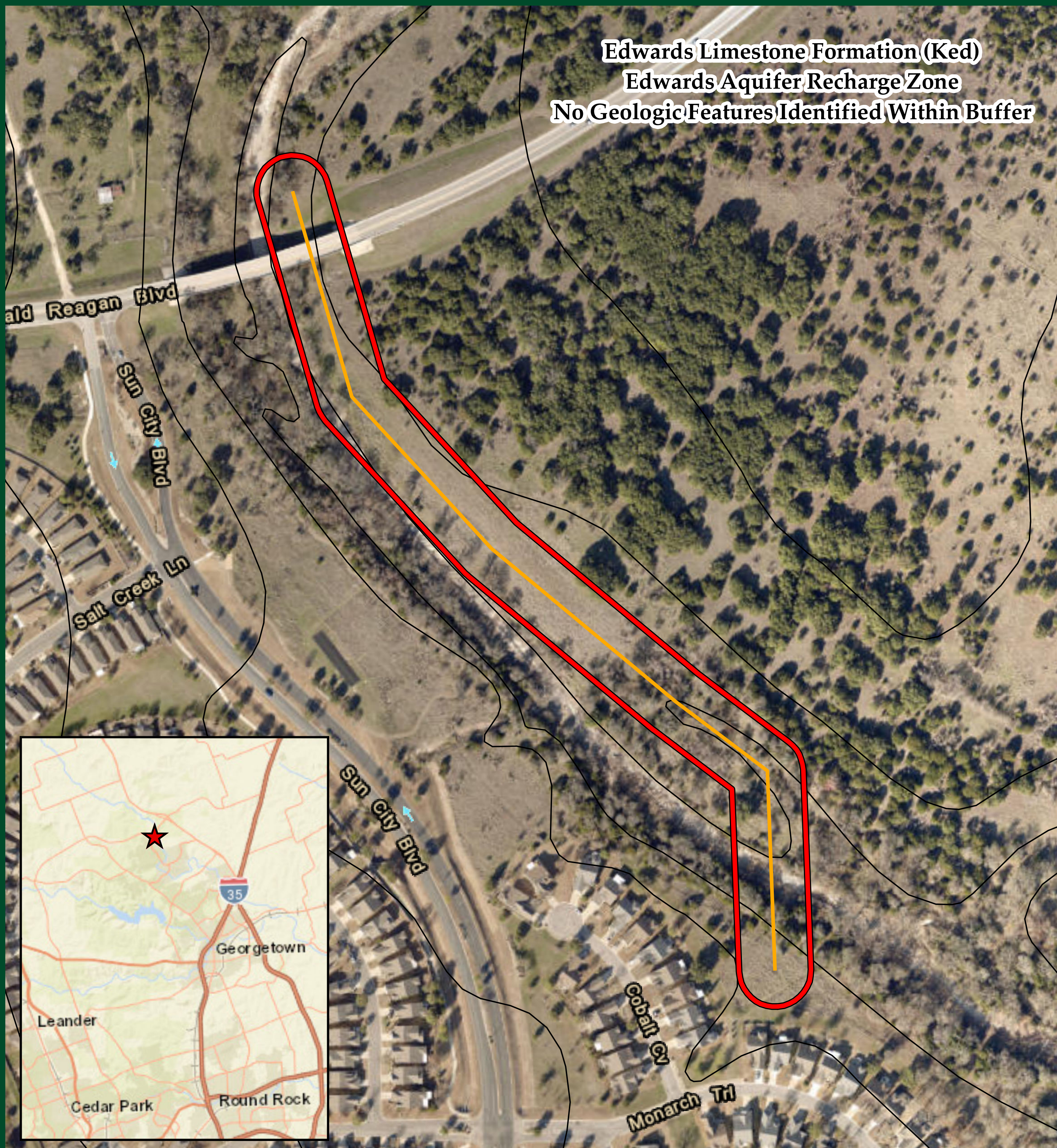
(TWDB) Texas Water Development Board. 2021. Water Data Interactive Groundwater Data Viewer. Accessed on May 4, 2021. Available at: http://www2.twdb.texas.gov/apps/waterdatainteractive/groundwaterdataviewer

(USDA NRCS) U.S. Department of Agriculture Natural Resources Conservation Service. 2021 WebSoilSurvey.com. Soil Survey Area: Williamson County, Texas. Date accessed: May 4, 2021.

ATTACHMENT A

Site Maps

P:\Project Folders\22-21-020 Berry Creek Off-site WWL\gis\maps\Figure1_Site Location.mxd



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

N

300 150 0 300 Feet

1:3,600 1 inch = 300 feet

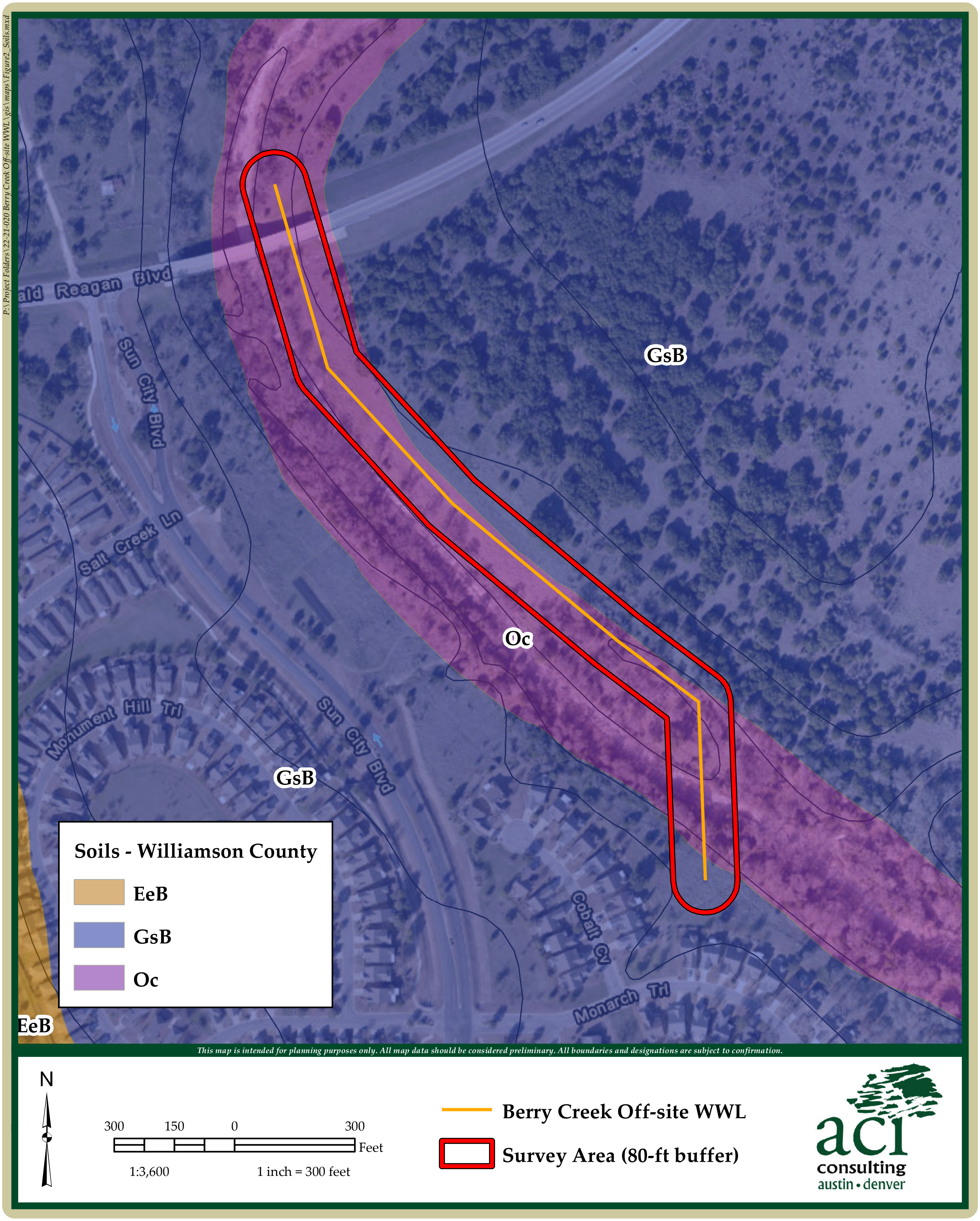
Berry Creek Off-site WWL

Survey Area (80-ft buffer)

aci consulting
austin • denver

Berry Creek Off-Site WWL **aci Project No.: 22-21-020**

Figure 1: Site Location **May 2021**

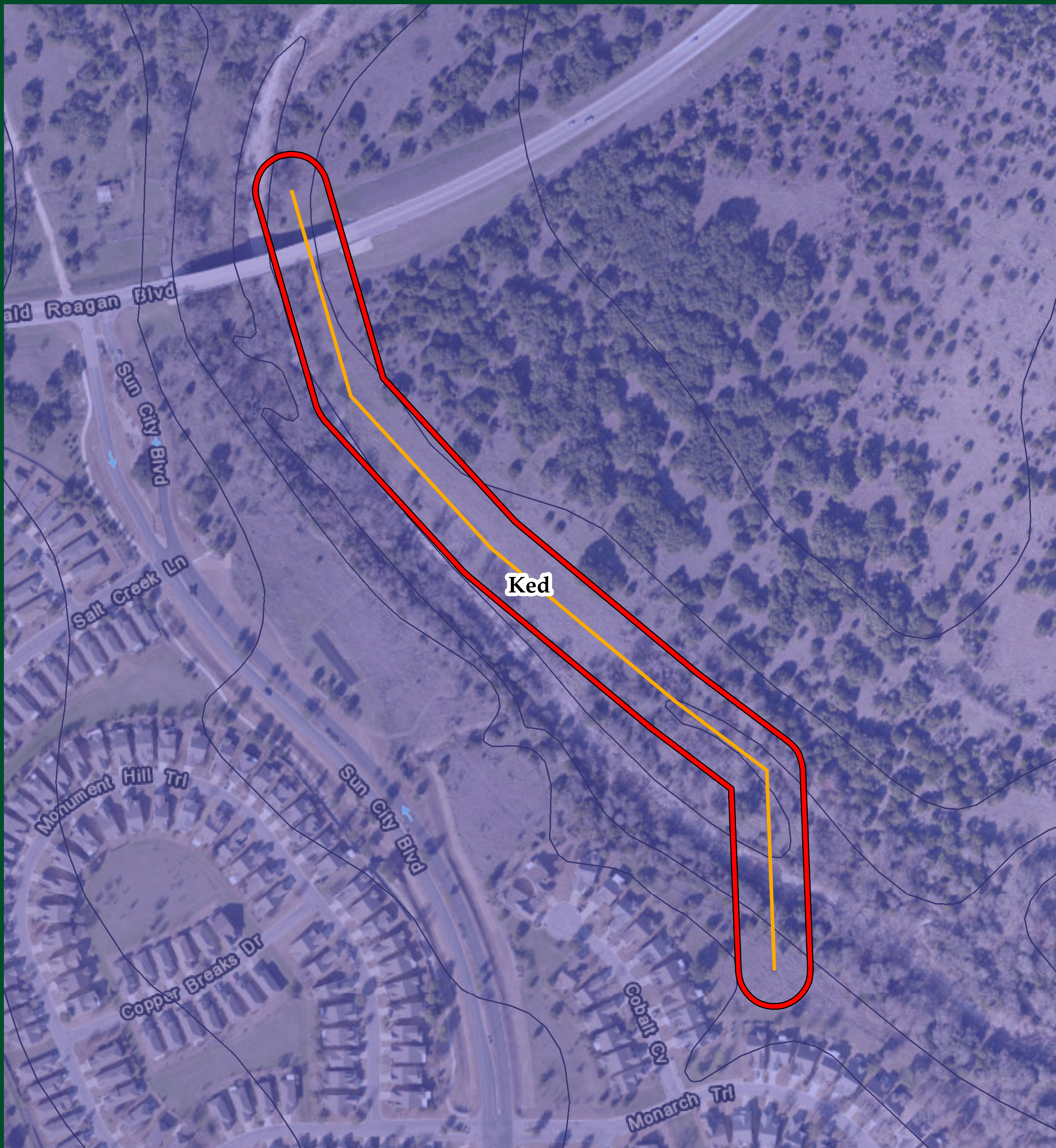


Berry Creek Off-Site WWL

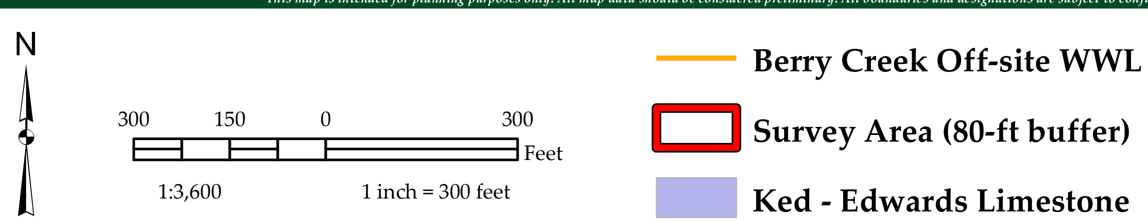
aci Project No.: 22-21-020

Figure 2: Soils

May 2021



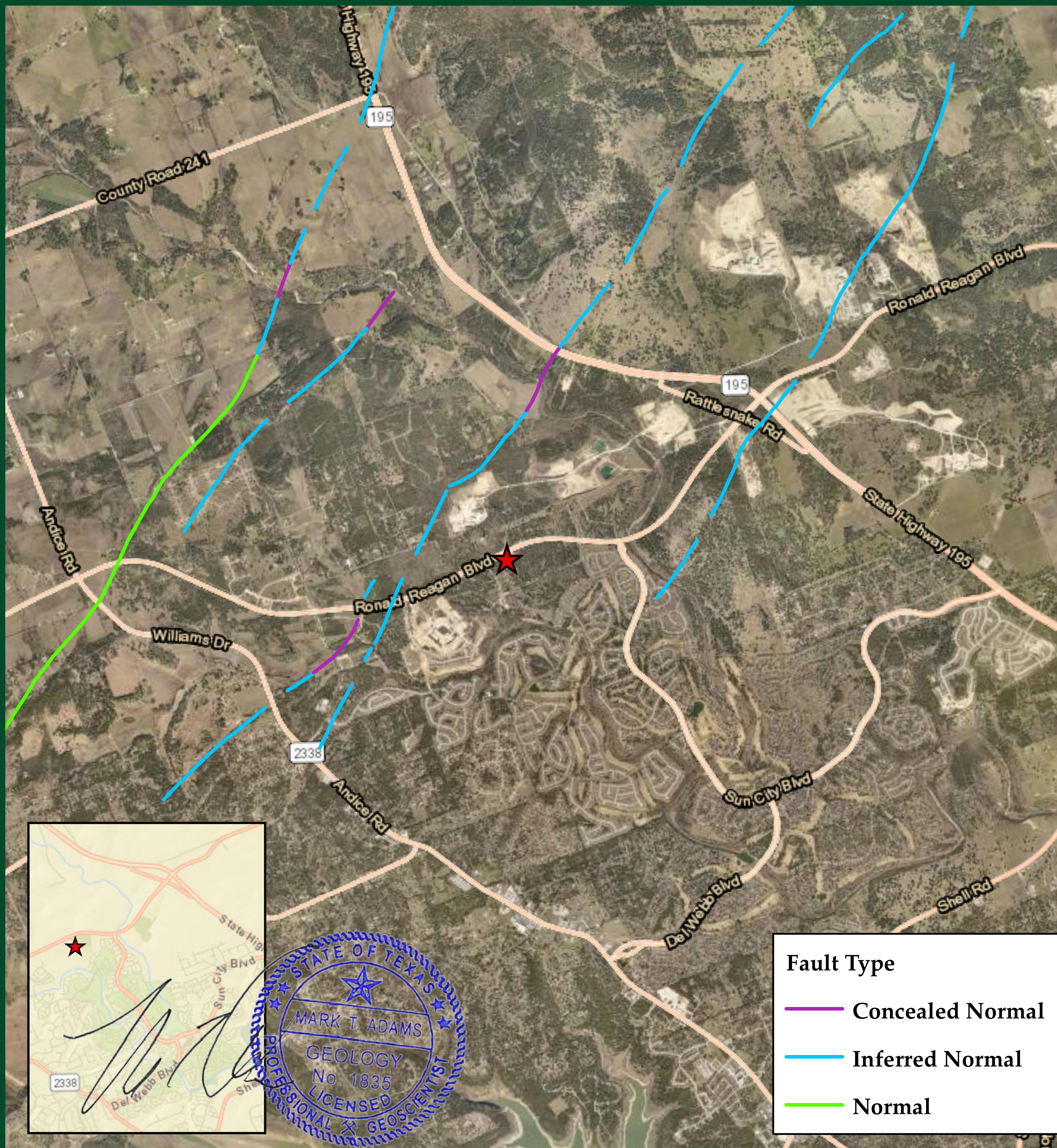
This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.



aci consulting
austin • denver

Berry Creek Off-Site WWL **aci Project No.: 22-21-020**

Figure 3: Site Geology Map **May 2021**



P:\Project Folders\22-14-009 Pulte Continuing Services Agreement\22-14-009D Somerset\GIS\maps\Task 21 - NH 80\Figure2_Regional Trend.mxd

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

N

5,000 2,500 0 5,000 Feet

1:60,000 1 inch = 5,000 feet

★ Subject Area

Regional Fault Trend: ~ 25°

aci consulting
austin • denver

Berry Creek Off-Site WWL **aci Project No.: 22-14-009D**

Figure 4: Regional Trend **May 2021**

aci consulting
austin • denver

ATTACHMENT B

Geologic Table
Geologic and Manmade Feature Map (Figure 5)
Feature Descriptions and Recommendations

GEOLOGIC ASSESSMENT TABLE			**PROJECT NAME:**			**Somerset Hills Subdivision Phases A-E**														
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	
No Features Encountered																				

* 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.

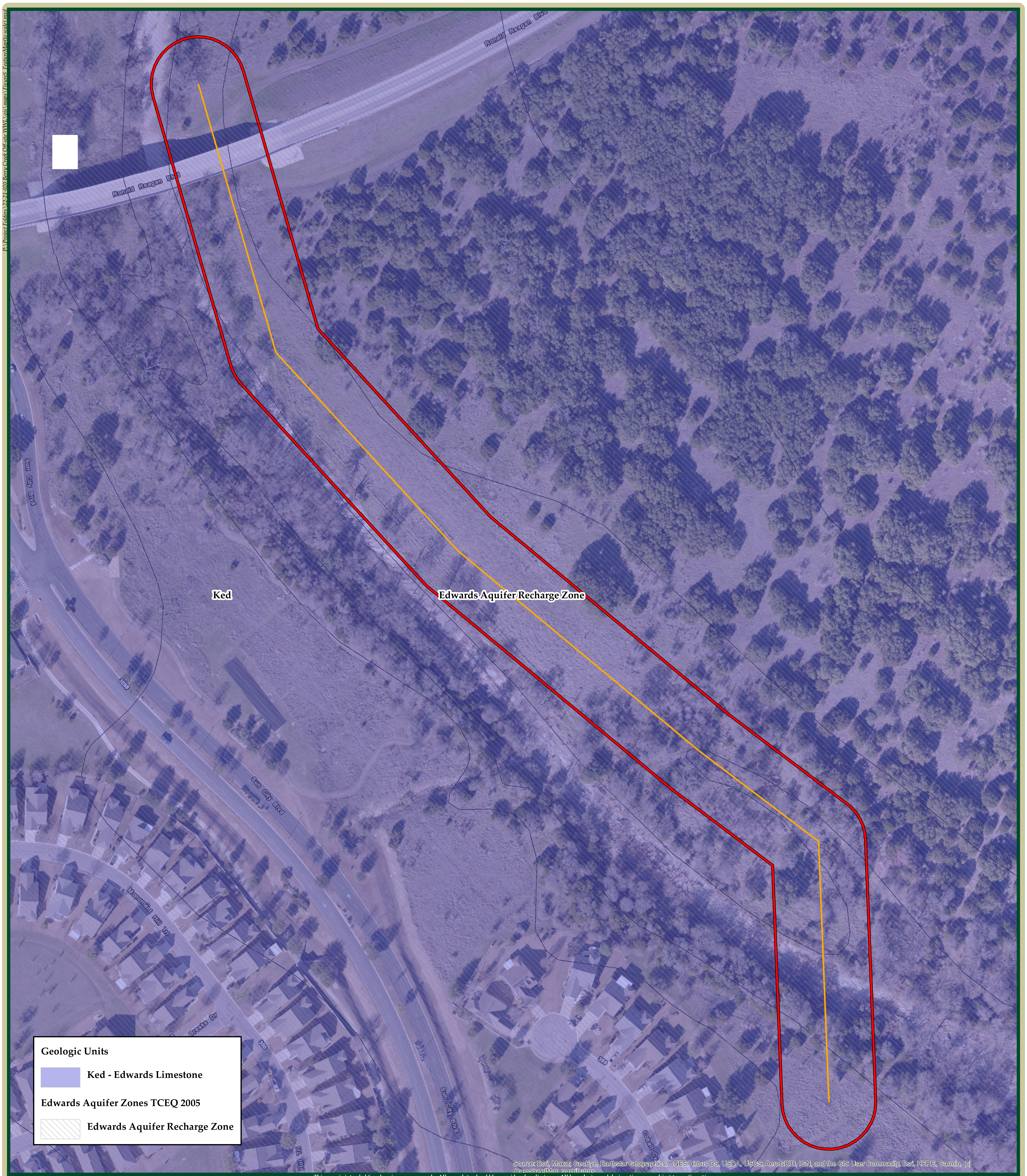
My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

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

Date 5/7/2021

Sheet __1___ of __1____

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



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

N

100 50 0 100 Feet

1:1,200 1 inch = 100 Feet

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

Survey Area (80-ft buffer)

Somerset Hills Subdivision PHases A-E WWL

No man-made or natural geologic features idenitifed

aci consulting
austin • denver

Somerset Hills Subdivision Phases A-E
Figure 5: Geologic Feature Map

aci Project No.: 22-21-020
May 2021

aci consulting
austin • denver

ATTACHMENT C

Historic Aerial Photographs

Prepared for:

ACI CONSULTING
1001 Mopac Circle
Austin TX 78746

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Historical Aerial Photographs

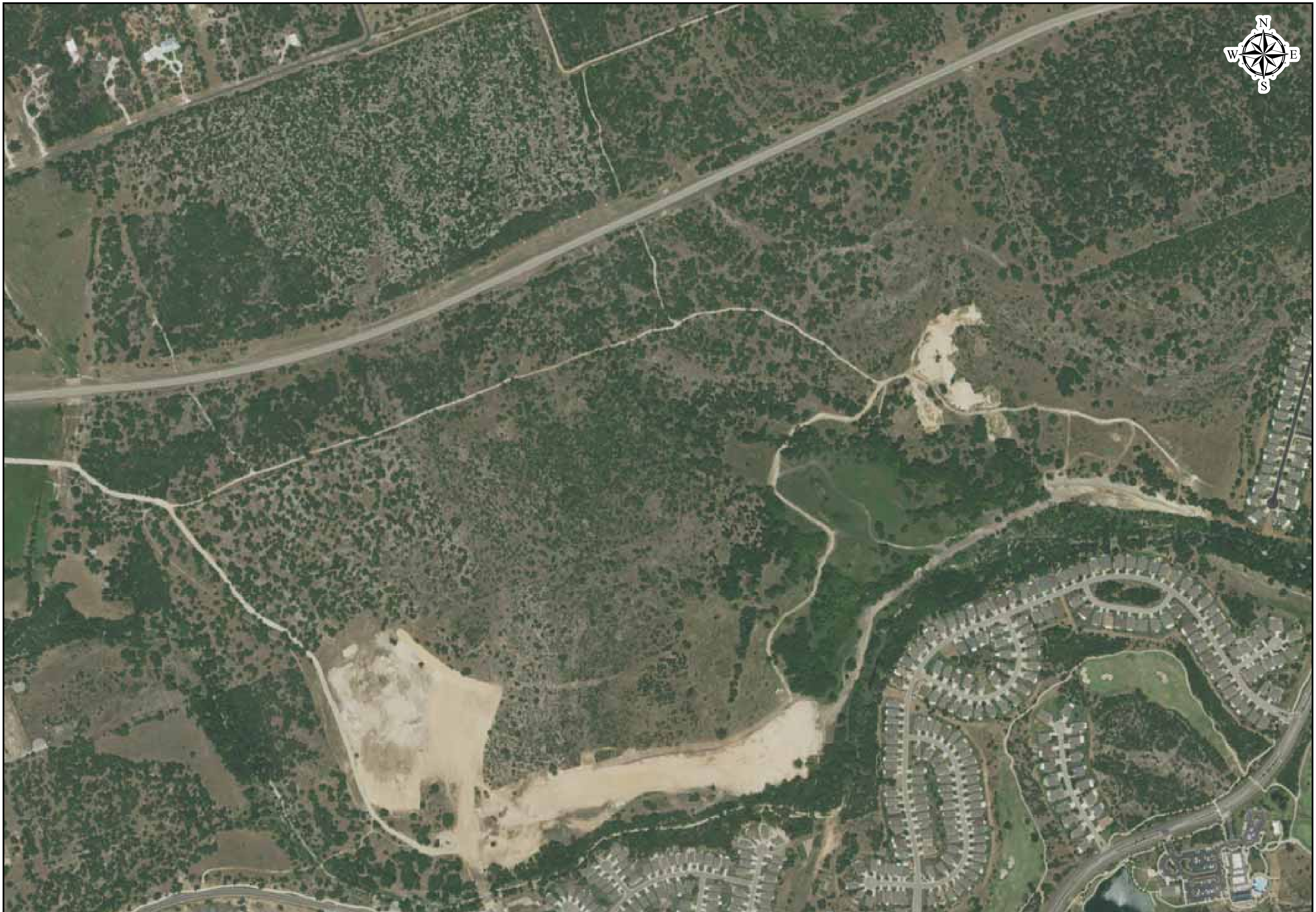
Somerset

Williamson County, TX

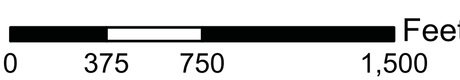
PO #: 22-14-009D

ES-129760

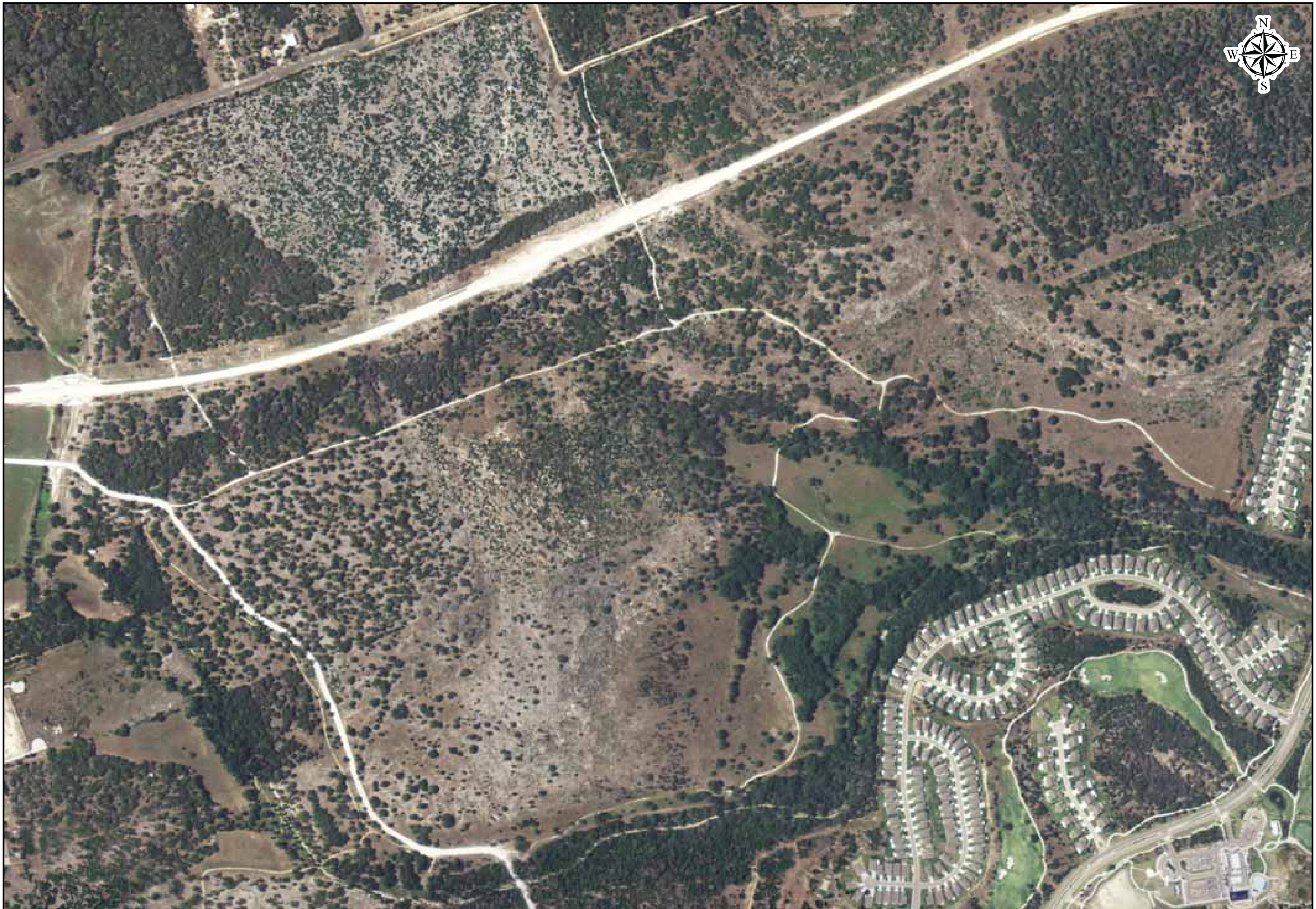
Monday, December 10, 2018



Date: 2016
Source: USDA



BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP



Date: 2012
Source: USDA

0 375 750 1,500 Feet

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 2008
Source: USDA

0 375 750 1,500 Feet

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 2004
Source: USDA

Feet
0 375 750 1,500

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 1995
Source: USGS

Feet
0 375 750 1,500

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 1988
Source: TXDOT

Feet
0 375 750 1,500

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 1981
Source: USGS

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 1970
Source: USGS

Feet
0 375 750 1,500

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 1964
Source: Fairchild

0 375 750 1,500 Feet

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 1953
Source: AMS

Feet
0 375 750 1,500

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Date: 1941
Source: ASCS

Feet
0 375 750 1,500

BANKS
ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

AERIAL SOURCE DEFINITIONS

Acronym	Agency
AerialOK	Aerial Oklahoma
AMS	Army Mapping Service
ASCS	Agricultural Stabilization & Conservation Service
EDAC	Earth Data Analysis Center
Fairchild	Fairchild Aerial Surveys
LDOT	Louisiana Department of Transportation
TXDOT	Texas Department of Transportation
USNavy	United States Navy
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
WSDOT	Washington State Department of Transportation

COPYRIGHT POLICY & DISCLAIMER

Modification of a Previously Approved Plan

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Transition Zone and Relating to 30 TAC 213.4(j), 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 request for a **Modification of a Previously Approved Plan** is hereby submitted for TCEQ review and executive director approval. The request was prepared by:

Print Name of Customer/Agent: Furman Tierra, LLC / Steger Bizzell, Tyson L. Hasz, P.E.

Date: 5/6/2024

Signature of Customer/Agent:

Tyson Hasz

____

Project Information

1. Current Regulated Entity Name: Somerset Hills Phases A-E
   Original Regulated Entity Name: Somerset Hills Phases A-E
   Regulated Entity Number(s) (RN): 111309837
   Edwards Aquifer Protection Program ID Number(s): 11002611/11002612
   ☒ The applicant has not changed and the Customer Number (CN) is: 605798909
   ☐ The applicant or Regulated Entity has changed. A new Core Data Form has been provided.

2. ☒ **Attachment A: Original Approval Letter and Approved Modification Letters**. A copy of the original approval letter and copies of any modification approval letters are attached.

3. A modification of a previously approved plan is requested for (check all that apply):
   - ☒ 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;
   - ☐ 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;
   - ☐ Development of land previously identified as undeveloped in the original water pollution abatement plan;
   - ☒ Physical modification of the approved organized sewage collection system;
   - ☐ Physical modification of the approved underground storage tank system;
   - ☐ Physical modification of the approved aboveground storage tank system.

4. ☒ Summary of Proposed Modifications (select plan type being modified). If the approved plan has been modified more than once, copy the appropriate table below, as necessary, and complete the information for each additional modification.

WPAP Modification Summary	***Approved Project***	***Proposed Modification***
Acres	113.39	133.159
Type of Development	Residential	Residential
Number of Residential Lots	410	384
Impervious Cover (acres)	42.67	48.34
Impervious Cover (%	37.6	36.3
Permanent BMPs	8	8
Other	______	______

SCS Modification Summary	***Approved Project***	***Proposed Modification***
Linear Feet	27699	26985
Pipe Diameter	4, 6, 8, 12	4, 6, 8, 12
Other	______	______

AST Modification Summary	***Approved Project***	***Proposed Modification***
Number of ASTs	_____	_____
Volume of ASTs	_____	_____
Other	_____	_____

UST Modification Summary	***Approved Project***	***Proposed Modification***
Number of USTs	_____	_____
Volume of USTs	_____	_____
Other	_____	_____

5. ☒ **Attachment B: Narrative of Proposed Modification**. A detailed narrative description of the nature of the proposed modification is attached. It discusses what was approved, including any previous modifications, and how this proposed modification will change the approved plan.

6. ☒ **Attachment C: Current Site Plan of the Approved Project**. A current site plan showing the existing site development (i.e., current site layout) at the time this application for modification is attached. A site plan detailing the changes proposed in the submitted modification is required elsewhere.
   - ☐ The approved construction has not commenced. The original approval letter and any subsequent modification approval letters are included as Attachment A to document that the approval has not expired.
   - ☐ The approved construction has commenced and has been completed. Attachment C illustrates that the site was constructed as approved.
   - ☐ The approved construction has commenced and has been completed. Attachment C illustrates that the site was **not** constructed as approved.
   - ☒ The approved construction has commenced and has **not** been completed. Attachment C illustrates that, thus far, the site was constructed as approved.
   - ☐ The approved construction has commenced and has **not** been completed. Attachment C illustrates that, thus far, the site was **not** constructed as approved.

7. ☐ The acreage of the approved plan has increased. A Geologic Assessment has been provided for the new acreage.
   ☒ Acreage has not been added to or removed from the approved plan.

8. ☒ 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.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 19, 2021

Mr. Maxwell Aaronson
Aaronson Tierra
P.O. Box 41805
Austin, TX 78704

Mr. Albert V. Furman III
Furman Tierra
801 W. 5th St. Apt. 206
Austin, TX 78703

Re: Edwards Aquifer, Williamson County

NAME OF PROJECT: Somerset Hills Phases A-E, Located North of Ronald Reagan Blvd. and Sun City Blvd., Georgetown, Texas

TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP) and Organized Sewage Collection System (SCS); 30 Texas Administrative Code (TAC) Chapter 213 & 217 Edwards Aquifer

Edwards Aquifer Protection Program ID Nos. 11002611 (WPAP) and 11002612 (SCS); Regulated Entity No. RN111309837

Dear Mr. Aaronson & Mr. Furman:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP and SCS Applications for the above-referenced project submitted to the Austin Regional Office by Steger Bizzell on behalf of Aaronson Tierra and Furman Tierra on August 04, 2021. Final review of the WPAP and SCS Applications was completed after additional material was received on October 20, 2021 and November 12, 2021. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) were selected and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213 and Chapter 217. These planning materials were sealed, signed, and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer Protection Plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

WPAP PROJECT DESCRIPTION

The proposed residential project will have an area of approximately 113.39 acres. It includes 410 single family residences, drives, utilities, and associated appurtenances. The impervious cover will be 42.67 acres (37.6 percent). Project wastewater will be disposed of by conveyance to the existing Pecan Branch Wastewater Treatment Plant.

PERMANENT POLLUTION ABATEMENT MEASURES

To prevent the pollution of stormwater runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, four (4) batch detention basins (Pond A - Pond D) and four engineered vegetative filter strips (VFS A – VFS D) designed using the TCEQ technical guidance document, Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices (2005), will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for this project is 37,140 pounds of TSS generated from the 42.67acres of impervious cover. The approved measures meet the required 80 percent removal of the increased load in TSS caused by the project.

SCS PROJECT DESCRIPTION

The proposed SCS will provide disposal service for 410 single family residences. The 27,699 linear feet gravity SCS and force main systems will consist of the pipe lengths listed in the table below:

Pipe Diameter (inches)	Linear Feet	Pipe Material	Specification
8	19,087	PVC SDR-26	ASTM D3034
8	520	PVC DR-18	ASTM D1784
12	837	PVC SDR-26	ASTM D3034
4	1675	PVC SDR-21	AWWA C900
6	5550	PVC SDR-26	ASTM D3034

The proposed lift station will consist of a 6-foot diameter wet well with an approximate depth of 21.5 feet, two 5.0 hp pumps and an emergency power generator. Each pump will have a pumping capacity of 120 gallons per minute (gpm) at a total dynamic head (TDH) of 65.9 feet. Additional equipment will include a control panel, an audio-visual alarm, auto-dial telemetry, hoisting equipment, level pump controllers, pump supports and discharge piping with valves, and a security fence with controlled access.

The system will be connected to an existing City of Georgetown wastewater line for conveyance to the existing Pecan Branch Treatment Plant for treatment and disposal. The project is located within the City of Georgetown and will conform to all applicable codes, ordinances, and requirements of the City of Georgetown.

GEOLOGY

According to the Geologic Assessment (GA) included with the application, the site includes Eckrant-Rock Outcrop association, Eckrant extremely stony clay and Georgetown stony clay loam. The surficial geologic unit is the Edwards Limestone formation. The TCEQ site assessment conducted on August 30, 2021 revealed the site to be generally in accordance with the description included in the GA.

Natural buffers were proposed for four sensitive features. No regulated activities (such as construction or soil disturbing activities) will take place within the natural buffer. The size is generally based on the drainage area of the sensitive feature. The setbacks are described in the following table.

Identification No.	Name	Buffer Description
F-16	Sinkhole with solution enlarged fracture	Radial buffer of 50 ft plus adjoining bedding plane void/footprint toward the north east (`13 ft long and 6 ft wide)
F-24	Sinkhole with solution enlarged fracture	Radial buffer of 50 ft
F-25 & F-26	Double Nickle Cave and Cannibal Lector Cave	Irregular shaped buffer based on combined drainage areas of F-25 & F-26. See Attachment F, Figure 5 of the GA dated June 4, 2020 of the application.
F-27	Solution cavities	Two solution cavities about 12 feet apart. Radial buffer of 50 ft around each solution cavity.

SPECIAL CONDITIONS

I. All permanent pollution abatement measures shall be operational prior to occupancy of the facility.

II. All sediment and/or media removed from the water quality basins during maintenance activities shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.
2. The holder of the approved Edwards Aquifer protection plan must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures contained in the approved plan. Additional and separate approvals, permits, registrations and/or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, UIC) can be required depending on the specifics of the plan.
3. In addition to the rules of the Commission, the applicant may also be required to comply with state and local ordinances and regulations providing for the protection of water quality.

Prior to Commencement of Construction:

4. Within 60 days of receiving written approval of an Edwards Aquifer Protection Plan, the applicant must submit to the Austin Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TCEQ-0625) that you may use to deed record the approved WPAP is enclosed.

5. All contractors conducting regulated activities at the referenced project location shall be provided a copy of this notice of approval. At least one complete copy of the approved WPAP, SCS and this notice of approval shall be maintained at the project location until all regulated activities are completed.
6. Modification to the activities described in the referenced WPAP and SCS applications following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.
7. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the Austin Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.
8. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved WPAP and SCS, must be installed prior to construction and inspected, maintained, and repaired during construction. Temporary E&S controls may be removed when vegetation is established, and the construction area is stabilized. If a water quality pond is proposed, it shall be used as a sedimentation basin during construction. The TCEQ may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.
9. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

<u>During Construction:</u>

10. During the course of regulated activities related to this project, the applicant or agent shall comply with all applicable provisions of 30 TAC Chapter 213 and Chapter 217, Edwards Aquifer. The applicant shall remain responsible for the provisions and conditions of this approval until such responsibility is legally transferred to another person or entity.
11. This approval does not authorize the installation of temporary aboveground storage tanks on this project. If the contractor desires to install a temporary aboveground storage tank for use during construction, an application to modify this approval must be submitted and approved prior to installation. The application must include information related to tank location and spill containment. Refer to Standard Condition No. 6, above.
12. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the Austin Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.

13. All water wells including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.

14. If sediment escapes the construction site, the 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). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

15. Discharges of sediment laden water are not allowed. If dewatering becomes necessary, the discharge will be filtered through appropriately selected best management practices.

16. The following records shall be maintained and made available to the executive director 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.

17. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

18. No part of the system shall be used as a holding tank for a pump-and-haul operation.

<u>After Completion of Construction:</u>

19. 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 Austin Regional Office within 30 days of site completion.

20. The applicant shall be 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. A copy of the transfer of responsibility must be filed with the executive director through Austin Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.

21. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.

22. Certification by a Texas Licensed Professional Engineer of the testing of sewage collection systems required by 30 TAC Chapter 213 and Chapter 217 shall be submitted to the Austin Regional Office within 30 days of test completion and prior to the new sewage collection system being put into service. The certification should include the project name as it appeared on the approved application, the program ID number, and two copies of a site plan sheet(s) indicating the wastewater lines that were tested and are being certified as complying with the appropriate regulations.

Every five years after the initial certification, the sewage collection system shall be retested. Any lines that fail the test must be repaired and retested. Certification that the system continues to meet the requirements of 30 TAC Chapter 213 and Chapter 217 shall be submitted to the Austin Regional Office. The certification should include the project name as it appeared on the approved application, the program ID number and two copies of a site plan sheet(s) indicating the wastewater lines that were tested and are being certified as complying with the appropriate regulations. Should any test result fail to meet passing test criteria, and then subsequently pass testing, the result(s) and an explanation of what repair, adjustment, or other means were taken to facilitate a subsequent passing result shall be provided.

23. If ownership of this organized sewage collection system is legally transferred (e.g., developer to city or Municipal Utility District), the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.

24. At project locations where construction is initiated and abandoned, or not completed, the site shall be returned to a condition such that the aquifer is protected from potential contamination.

25. An Edwards Aquifer protection plan approval or extension will expire, and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the Austin Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.

This action is taken under authority delegated by the Executive Director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Bob Castro, P.E. of the Edwards Aquifer Protection Program of the Austin Regional Office at (512) 339-2929.

Sincerely,

Lillian Butler

Lillian Butler, Section Manager
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality

LIB/rbc

Enclosures: Deed Recordation Affidavit, Form TCEQ-0625
Change in Responsibility for Maintenance of Permanent BMPs, Form TCEQ-10263

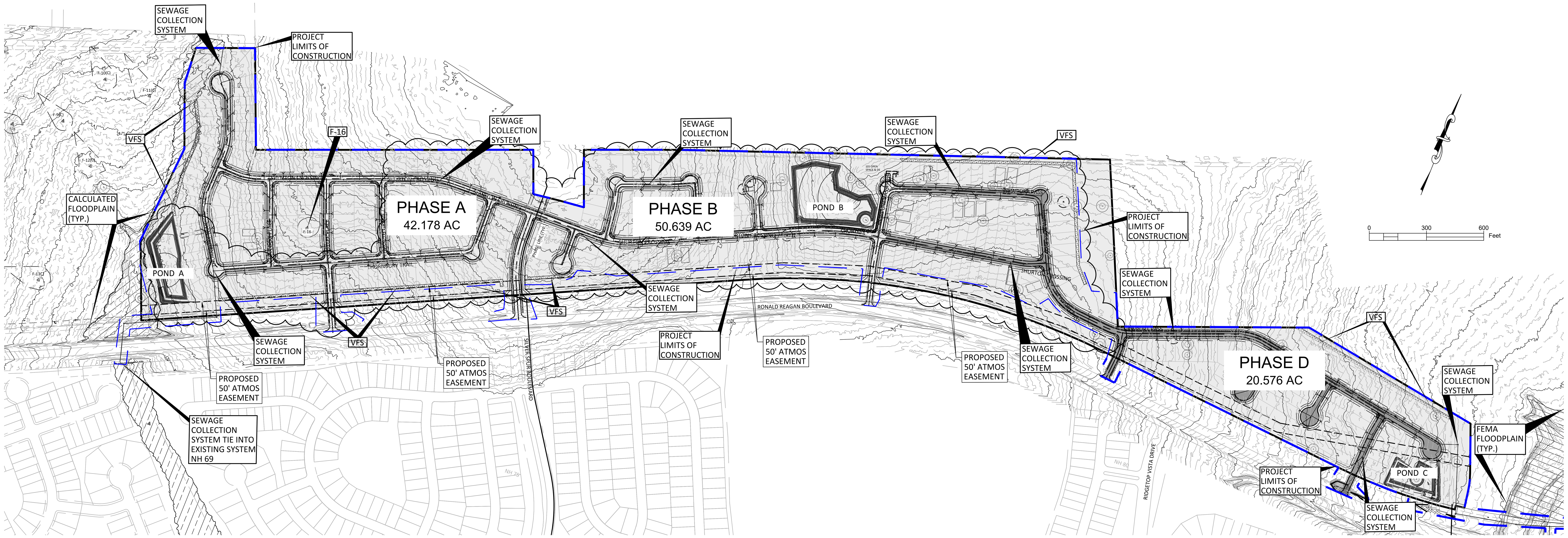
TCEQ-0590 Attachment B – Narrative of Proposed Modification

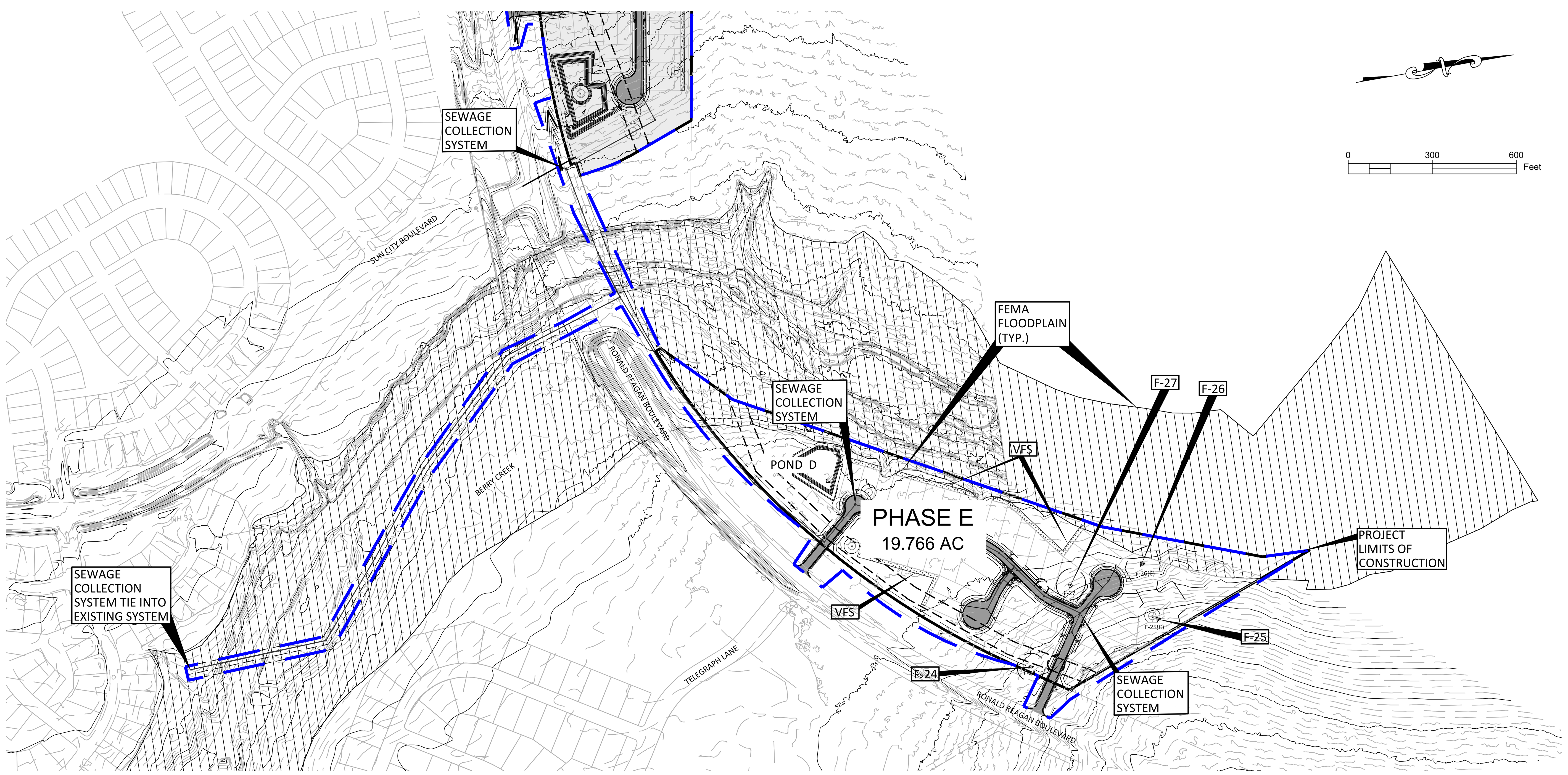
The project type (residential) and overall acreages are unchanged. A proposed 50-foot Atmos utility easement will be dedicated along the southern boundary of the property. This has required us to push portions of the development 50' north and has resulted in a reduction in the overall number of lots from 410 residential lots to 384 lots. The reduction in lots has decreased the linear feet of pipe in the sewer collection system from 27,699 feet to 26,985 feet.

In Phase A, the east-west portion of Thornbury Trail has been pushed 50' north, Pond A needed to be reconfigured to avoid conflicting with the proposed Atmos easement, proposed lots have been reconfigured as necessary to accommodate the revised streets, and Block F will now be single-family lots instead of parkland dedication.

In Phase B, the street and lot layouts have been totally overhauled in order to maximize lot yield with the new easement constraint, Pond B has been reconfigured, and an amenity lot has been added which was not proposed previously. Phase C has also been absorbed into Phase B, and a Phase C no longer exists.

Please note that there was a slight error in the calculation of the total project area. It was previously listed as 133.08 acres. However, it is actually 133.159 acres. Additionally, the original applications and project descriptions correctly listed the project size as 133 acres and the impervious cover as 46.67 acres (35% impervious cover). However, the Total Suspended Solids (TSS) Removal spreadsheets were completed per *parcel*, rather than per *project*. So, the acreage listed in the TSS Removal spreadsheets for Ponds A, B, and C in Parcel 6 was 113.39 acres, and the acreage listed for Pond D in Parcel 7 was 19.69 acres. It appears this resulted in the final project approval being for 113.39 acres with 42.67 acres of impervious cover (37.6%) rather than the 133.08 acres with 46.67 acres of impervious cover (35.06%) that was intended. ***With the site layout revisions that accompanied the addition of the Atmos easement, we are now applying for approval of 48.34 acres of impervious cover (36.3%) on the 133.16 acre project.***





SENSITIVE GEOLOGICAL BUFFER NOTES

The following sensitive geologic features and setbacks are in the vicinity of the project limits of construction:

1. F-16, 50-foot radius buffer.
2. F-24, 50-foot radius buffer.
3. F-25(C),50-foot down and side slope buffer with a 200-foot up slope buffer.
4. F-26(C),50-foot down and side slope buffer with a 200-foot up slope buffer.
5. F-27, 50-foot radius buffer.

NO.	REVISION	BY	DATE

TLH 5/6/2024
DESIGNED BY: DATE
JKL 5/6/2024
DRAWN BY: DATE
CHECKED BY: DATE
APPROVED BY: DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER

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

WPAP & SCS PLAN PHASES A-E MODIFICATION
for
SOMERSET HILLS PHASES A-E
Georgetown
Williamson County, Texas

Project No: 22226X

SHEET
1

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: Furman Tierra, LLC . / Steger Bizzell, Tyson L. Hasz, P.E.

Date: 5/6/2024

Signature of Customer/Agent:

____

Regulated Entity Name: Somerset Hills Phases A-E

Regulated Entity Information

1. The type of project is:

   ☒ Residential: Number of Lots: 384
   ☐ Residential: Number of Living Unit Equivalents:_____
   ☐ Commercial
   ☐ Industrial
   ☒ Other: 1 amenity lot

2. Total site acreage (size of property):133.159
3. Estimated projected population: 2.5 people per LUE * 384 = 960
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	1,314,710	÷ 43,560 =	30.18
Parking	0	÷ 43,560 =	0
Other paved surfaces	790,944	÷ 43,560 =	18.16
Total Impervious Cover	2,105,654	÷ 43,560 =	48.34

Total Impervious Cover 48.34 **÷ Total Acreage** 133.16 **X 100 =** 36.30**% 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 ____Gallons/day
____% Industrial ____Gallons/day
____% Commingled
340,875 Gallons/day
TOTAL gallons/day 340,875

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 08/04/2021.
☒ 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.

TCEQ-0584 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

TCEQ-0584 Attachment B – Volume and Character of Storm Water

Existing site conditions were for an undeveloped site. The proposed Somerset Hills Phases A-E is composed of drainage area F1 for phase A and part of drainage area J for part of phase B which discharge to Cowan Creek east of the property, as shown in the Cowan Creek drainage report. Part of phase B and phases D and E ultimately flow to Berry Creek. The portion of Phase B is represented in part of drainage area A in the Berry Creek drainage report, and phases D & E are represented by drainage area A1 in the Berry Creek drainage report. A summary of the drainage calculations is below and is also in the Somerset Hills 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 ponds for treatment or is conveyed across single-family lots via sheet flow and is treated with vegetative filter strips.

Cowan Creek Runoff Calculations – Existing Conditions

	Peak Discharge (cfs)			
BASIN	2-Year	10-Year	25-Year	100-Year
A	1318	2975	4042	5595
A-1	44	96	126	172
B	638	1342	1784	2421
C	242	523	698	954
D	720	1609	2182	3017
D-1	55	119	157	214
D-2	102	223	298	408
E	93	201	267	364
F	114	249	334	458
F-1	138	296	391	534
G	265	585	789	1087
H	534	1122	1491	2022
I	353	700	912	1215
J	173	376	502	687
K	61	120	155	206
L	526	1104	1468	1991
M	159	313	404	536
N	385	774	1017	1362

HMS Results:

	Peak Discharge (cfs)			
Point of Interest	2-Year	10-Year	25-Year	100-Year
J-1	9	5	1	-5
J-2	-6	-43	-79	-135
J-3	-2	-42	-78	-142
J-4	-24	-124	-214	-349
J-5	-14	-106	-194	-326
J-6	-4	-95	-175	-300
J-7	-32	-175	-271	-439

Cowan Creek Runoff Calculations – Developed Site

	Peak Discharge (cfs)			
BASIN	2-Year	10-Year	25-Year	100-Year
A	1318	2975	4042	5595
A-1	77	139	174	225
B	638	1342	1784	2421
C	447	818	1034	1342
D	720	1609	2182	3017
D-1	120	194	235	295
D-2	159	295	375	488
E	138	255	324	422
F	114	249	334	458
F-1	270	463	570	724
G	531	979	1245	1621
H	534	1122	1491	2022
I	353	700	912	1215
J	260	480	612	798
K	61	120	155	206
L	526	1104	1468	1991
M	159	313	404	536
N	385	774	1017	1362

HMS Results:

	Peak Discharge (cfs)			
Point of Interest	2-Year	10-Year	25-Year	100-Year
J-1	9	5	1	-5
J-2	-6	-43	-79	-135
J-3	-2	-42	-78	-142
J-4	-24	-124	-214	-349
J-5	-14	-106	-194	-326
J-6	-4	-95	-175	-300
J-7	-32	-175	-271	-439

Berry Creek Runoff Calculations – Existing Conditions

	Peak Discharge (cfs)			
BASIN	2-Year	10-Year	25-Year	100-Year
A	6603.3	15671.8	21589.1	30323.0
A-1	85.6	183.5	241.9	329.7
B	290.3	567.2	732.4	971.2
C	352.9	772.9	1031.9	1412.3
D	70.5	156.3	210.8	289.9
E	250.4	499.7	652.9	870.4
F	122.9	267.5	357.2	490.3
G	773.0	1613.5	2139.6	2898.8
H	3858.0	8477.9	11422.7	15689.7
I	1409.0	3063.4	4108.1	5625.0
J	1173.3	2343.1	3070.3	4108.7
K	776.6	1591.5	2103.6	2837.5
L	156.3	341.6	460.1	632.7

HMS Results:

	Peak Discharge (cfs)			
Point of Interest	2-Year	10-Year	25-Year	100-Year
J-1	0.0	0.0	0.0	0.0
J-2	0.0	0.0	0.0	0.0
J-3	0.0	0.0	0.0	0.0
J-4	0.0	-0.1	-0.1	0.0

Berry Creek Runoff Calculations – Developed Site

		Peak Discharge (cfs)		
BASIN	2-Year	10-Year	25-Year	100-Year
A	6603.3	15671.8	21589.1	30323.0
A-1	134.9	247.1	309.9	402.8
B	290.3	567.2	732.4	971.2
C	352.9	772.9	1031.9	1412.3
D	110.3	217.9	282.5	375.2
E	250.4	499.7	652.9	870.4
F	180.8	360.6	465.1	620.6
G	773.0	1613.5	2139.6	2898.8
H	3858.0	8477.9	11422.7	15689.7
I	1409.0	3063.4	4108.1	5625.0
J	1173.3	2343.1	3070.3	4108.7
K	776.6	1591.5	2103.6	2837.5
L	214.0	404.5	517.6	679.0

HMS Results:

	Peak Discharge (cfs)			
Point of Interest	2-Year	10-Year	25-Year	100-Year
J-1	0.0	0.0	0.0	0.0
J-2	0.0	0.0	0.0	0.0
J-3	0.0	0.0	0.0	0.0
J-4	0.0	-0.1	-0.1	0.0

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: Somerset Hills 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:

3. Customer (Applicant):

Contact Person: Albert V. Furman III
Entity: Furman Tierra, LLC
Mailing Address: 801 W. 5th St. Apt. 206
City, State: Austin, TX Zip: 78703
Telephone: (512) 924 - 5526 Fax: N/A
Email Address: avfurman@aol.com

The appropriate regional office must be informed of any changes in this information within 30 days of the change.

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

Contact Person: Mr. Tyson L Hasz, P.E.
Texas Licensed Professional Engineer's Number: 145151
Entity: Steger Bizzell
Mailing Address: 1978 S. Austin Ave
City, State: Georgetown, TX Zip: 78626
Telephone: (512) 930-9412 Fax: n/a
Email Address: tyson.hasz@stegerbizzell.com

Project Information

5. 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: 384
   ☐ Multi-family: Number of residential units: _____
   ☐ Commercial
   ☐ Industrial
   ☐ Off-site system (not associated with any development)
   ☒ Other: Amenity Center

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

   100% Domestic — 340,875 gallons/day
   0% Industrial — n/a gallons/day
   0% Commingled — n/a gallons/day

   Total gallons/day: 340,875

7. Existing and anticipated infiltration/inflow is 65,260 gallons/day. This will be addressed by: The project is all new construction with PVC pipe serving the new development and a lift station located centrally in the property.

8. 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 11/19/2021. A copy of the approval letter is attached.
   ☐ The WPAP application for this development was submitted to the TCEQ on ________, 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.

9. Pipe description:

Table 1 - Pipe Description

Pipe Diameter(Inches)	***Linear Feet (1)***	***Pipe Material (2)***	***Specifications (3)***
4" Force Main	1541	SDR-26	ASTM 3034
6" Services	5300	SDR-26	ASTM 3034
8" Gravity	18738	SDR-26	ASTM D 3034
8" Gravity	560	DR-18	ASTM D 1784
12" Gravity	837	SDR-26	ASTM D 3034

Total Linear Feet: 26976

(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.

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

    ☒ Existing
    ☐ Proposed

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

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

12. ☐ 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

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

14. ☒ 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

15. ☒ 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 Attached Table	of		
	of		
	of		
	of		
	of		
	of		

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

17. ☒ 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	2000

☐ **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.

18. ☐ 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.

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

Site Plan Scale: 1" = <u>100</u>''.

20. ☒ 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.

21. 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.

22. 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.

23. 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***
SEWR-A	152 of 218	17+46.85 to 21+33.40
SEWR-Q	156 & 157 of 218	18+27.30 to 23+83.87
SEWR-M	155 & 157 of 218	24+11.61 to 48+23.29

24. 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

25. ☒ Legal boundaries of the site are shown.

26. ☒ 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.

27. ☒ 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				

28. 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***
SEWR-M	4' SEWR-M MH-12	31+23.22	157
SEWR-M	4' SEWR-M MH-16	45+00.11	157

29. 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			

30. 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.

31. 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.

32. 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.

33. 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					

34. 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

35. ☒ 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.

36. ☒ 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]**	195 of 218
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) **[Required]**	194 of 218
Alternate method of joining lateral to existing SCS line for potential future connections **[Required]**	194 of 218
Typical trench cross-sections **[Required]**	194 of 218
Bolted manholes **[Required]**	195 of 218
Sewer Service lateral standard details **[Required]**	194 of 218
Clean-out at end of line **[Required, if used]**	194 of 218
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]**	195 of 218
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) **[Required, if Flexible Pipe is used]**	195 of 218
Drop manholes **[Required, if a pipe entering a manhole is more than 24 inches above manhole invert]**	N/A of N/A

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

38. ☒ 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: 6/7/2024

39. ☒ 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.

40. ☒ 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: Mr. Tyson Hasz, P.E.

Date: 5/6/2024

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)

TCEQ 0582 Supplemental Tables

Table 2 – Manholes and Cleanouts

Line	Shown on Sheet	Station	Manhole or Cleanout?
A	152 of 218	0+00	Cleanout
B	152 of 218	5+38.07	Cleanout
C	152 of 218	0+00	MH
D	152 of 218	0+00	MH
E	152 of 218	0+00	MH
F	152 of 218	0+00	MH
G	153 of 218	0+00	MH
H	153 of 218	0+00	MH
I	153 of 218	0+00	MH
J	153 of 218	0+00	MH
K	154 of 218	0+00	MH
L	154 of 218	0+00	MH
M	155 of 218	0+00	MH
N	155 of 218	0+00	MH
O	155 of 218	0+00	MH
P	155 of 218	0+00	MH
Q	156 of 218	0+00	MH
R	156 of 218	0+00	MH
S	156 of 218	0+00	MH
T	153 of 218	0+00	MH

TCEQ 0582 Supplemental Tables

Table 5 - Water Line Crossings

Line	Station or Closest Point	Crossing or Parallel	Horizontal Separation Distance	Vertical Separation Distance
A	14+15.26	Crossing	N/A	2.74'
B	2+14.47	Crossing	N/A	2.00'
B	5+48.07	Crossing	N/A	8.05'
B	5+74.08	Crossing	N/A	9.46'
B	7+97.72	Crossing	N/A	9.70'
B	13+91.68	Crossing	N/A	2.74'
B	16+81.70	Crossing	N/A	2.86'
B	19+79.17	Crossing	N/A	2.28'
B	22+61.85	Crossing	N/A	2.20'
C	2+09.36	Crossing	N/A	2.04'
C	15+62.04	Crossing	N/A	4.46'
D	3+38.95	Crossing	N/A	2.14'
E	3+04.95	Crossing	N/A	2.02'
F	2+89.26	Crossing	N/A	2.10'
G	1+77.70	Crossing	N/A	3.67'
H	0+18.46	Crossing	N/A	2.07'
J	1+77.41	Crossing	N/A	2.27'
J	5+35.35	Crossing	N/A	2.02'
L	1+45.05	Crossing	N/A	2.87'
L	9+90.90	Crossing	N/A	2.84'
M	17+83.88	Crossing	N/A	2.37'
M	21+54.81	Crossing	N/A	5.95'
N	2+16.97	Crossing	N/A	2.08'
O	1+92.98	Crossing	N/A	2.13'
P	2+33.26	Crossing	N/A	2.06'
Q	20+66.01	Crossing	N/A	7.19'
R	1+53.49	Crossing	N/A	2.20'
S	0+47.00	Crossing	N/A	2.13'

ATTACHMENT A

ENGINEERING DESIGN REPORT

FOR

Somerset Hills Phases A-E
Organized Sewage Collection System

Job No. 22226x-6A&B

Prepared by:

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

Engineering Design Report
For a
WASTEWATER COLLECTION SYSTEM
Within
Somerset Hills 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 Somerset Hills Phases A-E. The site will include development of the 133.159 acre tract to be known as Somerset Hills and containing 384 residential lots and 1 lot for an amenity center. Somerset Hills is a high quality, residential development located in Georgetown, Texas.

There are two separate collection systems for the site, one that serves Phases A and B, and the other that serves Phases D and E. (Note: Phase C has been incorporated into Phase B.)

Phases A and B:
The sewage collection system (SCS) from Somerset Hills Phases A and B will be connected to the existing 4-foot Manhole south of Ronald Reagan Boulevard that was constructed with Sun City Neighborhood (NH) 69. This collection system was reviewed and approved as a part of Neighborhood 69 Off-Site Wastewater System Improvement (EAPP ID No. 11001402). The SCS from NH 69 to the Cowan Creek interceptor has been sized for the ultimate development of the contributing watershed. The system will ultimately flow to an existing 21-inch Wastewater Interceptor along Cowan Creek and onto 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.

Phases D and E:
The sewage collection system from Somerset Hills Phases D and E will be connected to the existing 4-foot Manhole along Berry Creek that was constructed with Sun City Neighborhood 32. This collection system was reviewed and approved as a part of Neighborhood 32 Off-Site Wastewater System Improvement. The SCS from NH 32 to the Berry Creek interceptor has been sized for the ultimate development of the contributing watershed. The system will ultimately flow to an existing 21-inch Wastewater Interceptor along Berry Creek and onto 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.

The CITY OF GEORGETOWN will own and maintain the sanitary sewer collection system described in this application. The PECAN BRANCH WWTP wastewater treatment plant (WWTP) will receive and treat flows from the project. The TCEQ Permit No. is WQ 0010489002 . The Permittee is the Aaronson Tierra, LLC and Furman Tierra, LLC. 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):

- Somerset Hills = 2.5 people/LUE*(70 gpcd + 30 gpcd) = 250 gpd/LUE
- Amenity Center = 10 LUE's = 2500 gpd

Somerset Hills Phases A-E:
Phases A & B to Existing Sun City NH 32 (288 lots + 1 amenity center)
AvgDWF= ((288 lots *250 gpd/LUE) + (10 LUE's * 250 gpd/LUE))/10^6
= (72,000 gpd + 2,500 gpd)/10^6 = 0.0745 (mgd)
Peak Flow Factor (PF) = 2.8*AvgDWF$^{-0.0732}$ = 3.39
Peak DWF = PF*DWF = 252,555 gpd

Phases D & E to Existing Sun City NH 69 (96 lots)
AvgDWF= (96 lots *250 gpd/LUE)/10^6 = 24,000 gpd/10^6 = 0.024 (mgd)
Peak Flow Factor (PF) = 2.8*AvgDWF$^{-0.0732}$ = 3.68
Peak DWF = PF*DWF = 88,320 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 NH32 portion of the system (Phases D&E) is 11.87 acres and the total area contributing to infiltration for the NH69 portion of the system (Phases A&B) is 53.39 acres. Therefore, the flow resulting from I/I would be as follows:

Somerset Hills Phases A-E:
PH A-B: 53.39 acres*1,000 gallons/acre/day = 53,390 gpd
PH D-E: 11.87 acres*1,000 gallons/acre/day = 11,870 gpd
Potential peak flow in the system would be as follows:

Somerset Hills Phases A-E:
PH A-B: 252,555 gpd + 53,390 gpd = 305,945 gpd or 0.4734 cfs
PH D-E: 88,320 gpd + 11,870 gpd = 100,190 gpd or 0.1550 cfs

The wastewater line in Somerset Hills Phases A-E consists of eight-inch and twelve-inch gravity pipe and four-inch pressure pipe.

The sewage collection system from Somerset Hills Phases A and B will be connected to the existing 4-foot Manhole south of Ronald Reagan Boulevard that was constructed with Sun City NH 69. The sewage collection system from Somerset Hills Phases D and E will be connected to the existing 4-foot Manhole along Berry Creek that was constructed with Sun City Neighborhood 32.

For the portion of the collection system proposed in this report which encompasses the Somerset Hills Phases A-E 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 6.26%. The required minimum slope for 8-inch diameter pipe is 0.33%, and the required maximum slope is 8.40%. The proposed minimum and maximum slope for 12-inch diameter pipe is 0.20%. The required minimum slope for 12-inch pipe is 0.20% and 4.88%. The proposed system meets these requirements.

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
4” Pressure	1541	PVC SDR-26	ASTM 3034	ASTM D 3212
6” Services	5300	PVC SDR-26	ASTM 3034	ASTM D 3212
8" Gravity	18738	PVC SDR-26	ASTM D 3034	ASTM D 3212
8" Gravity	560	PVC DR-18	ASTM D 1784	ASTM D 3139
12" Gravity	837	PVC SDR-26	ASTM D 3034	ASTM D 3212
18” Encasement	233	Ductile Iron	ASTM A746	ANSI C11
24” Encasement	207	Ductile Iron	ASTM A746	ANSI C11

Separation distances (30 TAC §217.53(d))

The proposed wastewater collection system complies with the TCEQ Separation Distance requirements for horizontal separation. There are crossings of the wastewater and water systems which are labeled on the appropriate sheets.

Building laterals and taps (30 TAC §217.53(e))

There are 6” laterals to proposed lots in this project.

Bores (30 TAC §217.53(f))

There are 3 bores associated with this project. One is on line A from STA 20+31.79 to STA 20+92.98 and the others are on line M from STA 45+03.39 to STA 47+10.02 and STA 24+91.52 to STA 26+63.34.

Corrosion potential (30 TAC §217.53(g)), Odor control (30 TAC §217.53(h))

PVC SDR26 meeting the requirements of ASTM D3034 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 Somerset Tract, including Somerset Hills Phases A-E.

Structural analysis (30 TAC §217.53(k))

Structural analysis is not required for the proposed collection system of the Somerset Hills development.

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 0.5% and the maximum slope is 6.26%. For 12" diameter pipe, the minimum slope is 0.20%, and the maximum slope is 4.88%. For this system the proposed minimum and maximum slope is 0.20%.

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.

<u>CRITERIA FOR LAYING PIPE</u> 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 194 and 195 of the Somerset Hills Phases A-E Construction Plans. 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 45" respectively. The maximum trench width for 8", 12", 15", 18" and 21" pipe is 35", 39", 41", 45" and 48" respectively.

<u>MANHOLES AND RELATED STRUCTURES</u> 30 TAC §217.55

Precast concrete manholes are proposed for this project. A detail for the manhole is included in on Sheets 194 and 195 of the Somerset Hills Phases A-E Construction Plans. 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 Sheet 194-195 of the Somerset Hills Phases A-E Construction Plans for cleanouts proposed. Details for the manhole covers and inverts are included on Sheet 194 of the Somerset Hills Phases A-E Construction Plans.

The manholes have been spaced to comply with Table C.2 of 30 TAC §217.55. The maximum spacing between manholes is <u>500.00'</u>.

<u>TRENCHLESS PIPE INSTALLATION</u> 30 TAC §217.54

A portion of the proposed collection system, STA 20+31.79 to STA 20+92.98 of line SEWR-A and STA STA 24+91.52 to STA 26+63.34 of SEWR-M, will be installed employing <u>bore & jack.</u> An 18" steel casing with 35,000 psi yield strength and a minimum pipe thickness of 0.3125" will be installed per the City of Georgetown detail W14. Detail W14 is included in the construction plans on Sheet 196. The carrier pipe will be 8" PVC SDR-26 pipe. The soil is primarily characterized as limestone bedrock. A portion of the proposed collection system, STA 45+03.39 to STA 47+10.02 will be installed by employing a bore & jack. A 24" steel casing with 35,000 psi yield strength and a minimum pipe thickness of 0.3750" will be installed per the City of Georgetown detail W14. The carrier pipe will be 12" PVC SDR-26 pipe. There are no laterals or service connections nor a need for flow bypass provisions in this section.

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

The testing requirements for Gravity System Pipes are included in the Construction Plans 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

See attachment Somerset Hills Phases A-E Lift Station and Force Main Design Report

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)	=	128.50	psi
h = height of soil surface above top of pipe in inches (in)	=	252	"
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.	=	21.00	'
B' = Empirical coefficient of elastic support	=	0.49	
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)	=	19.72	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)	=	157.79	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.	=	8.625	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.	=	332	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

$P_s/SSF = P_s/0.61*zeta*E_b > \text{ or } = 0.15$ 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	=	1.04	%
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.	=	21	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.	=	18.96	psi

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

USE THIS SPREADSHEET TO ASSIST COMPLETION OF TNRCC FORM 10243.
FILL IN INFORMATION IN THE YELLOW CELLS. TAB BETWEEN CELLS.
ASTM D3034 PIPE (NOT ASTM D2241)
CHOOSE PIPE SDR AND DIAMETER

SDR = 26
Dia. = 12 "
Wall = 0.481 "

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)	=	137.09 psi
h = height of soil surface above top of pipe in inches (in)	=	310 "
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.	=	25.83 '
B' = Empirical coefficient of elastic support	=	0.57
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.	=	0.00927372
t = pipe structural wall thickness (in)	=	0.481 "
D = mean pipe diameter (in)	=	12 "

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)	=	24.26 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)	=	291.08 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.	=	12.481 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	=	5.772 $in.^2$/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.	=	342 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)	=	0.00927372	in.
r =mean radius (in)	=	6	in.
P_s	=	115	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)	=	115	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	=	0.63	

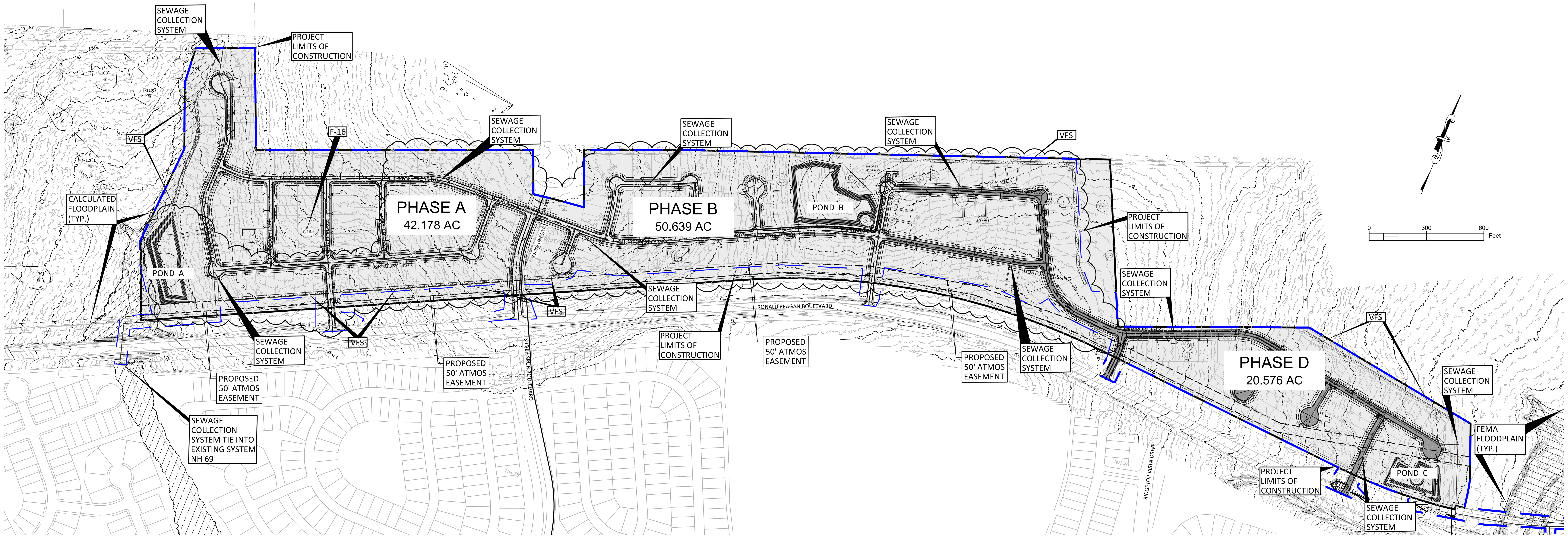
T86) Calculate and report predicted deflection.

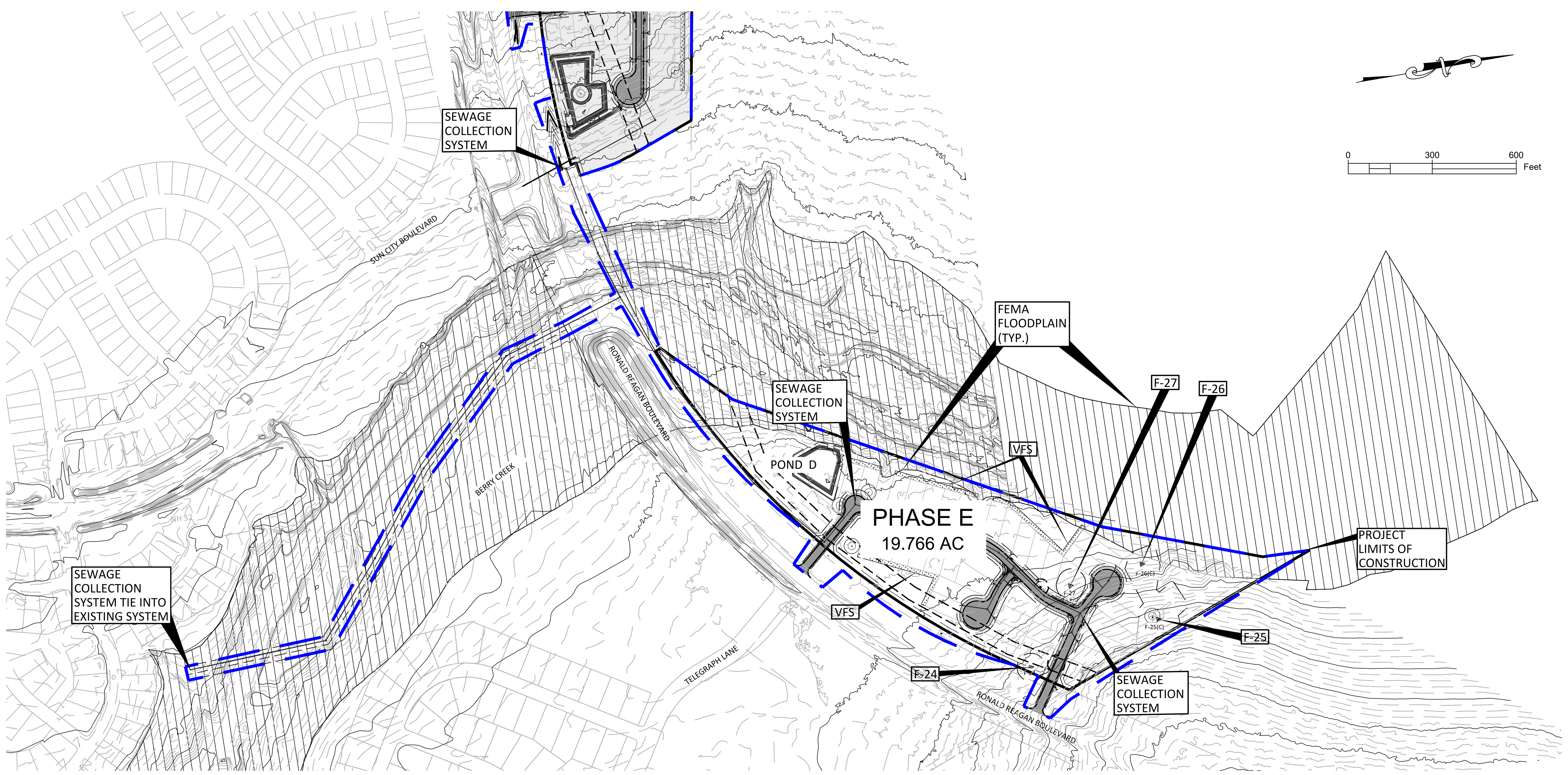
$DeltaY/D(\%) = (K*(L_p+L_l)*100)/((0.149*P_s)+(0.061*zeta*E_b))$ Equation (13)

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

Delta Y/D = Predicted % vertical deflection under load	=	1.28	%	< 2%
DeltaY = Change in vertical pipe diameter under load				
D = Undeflected mean pipe diameter (in)	=	12	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.	=	25.8333333	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.	=	23.32	psi	

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





SENSITIVE GEOLOGICAL BUFFER NOTES

The following sensitive geologic features and setbacks are in the vicinity of the project limits of construction:

1. F-16, 50-foot radius buffer.
2. F-24, 50-foot radius buffer.
3. F-25(C),50-foot down and side slope buffer with a 200-foot up slope buffer.
4. F-26(C),50-foot down and side slope buffer with a 200-foot up slope buffer.
5. F-27, 50-foot radius buffer.

NO.	REVISION	BY	DATE

TLH 5/6/2024
DESIGNED BY: DATE
JKL 5/6/2024
DRAWN BY: DATE
CHECKED BY: DATE
APPROVED BY: DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER

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

WPAP & SCS PLAN PHASES A-E MODIFICATION
for
SOMERSET HILLS PHASES A-E
Georgetown
Williamson County, Texas

Project No:
22226X

SHEET
1

SCS Site Plan

See Overall Wastewater Plans in Attached Somerset Hills Phases A-E construction plans.

Final Plan and Profile Sheets

See the Attached Somerset Hills Phases A-E construction plans for sewage collection system plan and profile sheets.

Lift Station/Force Main System Application

Texas Commission on Environmental Quality

for Regulated Activities On the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(c)(3)(B)and(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: Somerset Hills Phases A-E

Customer Information

(If different than customer information provided on core data form)

1. The person(s) responsible for providing the engineering certification to the TCEQ pursuant to 30 TAC §213.5(f)(2)(C) during construction and 30 TAC §213.5 (c)(3)(D) upon completion of construction is:

   Contact Person: Albert V. Furman III
   Entity: Furman Tierra, LLC
   Mailing Address: 801 W. 5th St. Apt. 206
   City, State: Austin, TX Zip: 78703
   Telephone: (512) 924 - 5526 Fax: N/A
   Email Address: avfurman@aol.com

2. The engineer responsible for the design of this lift station and force main:

   Contact Person: Mr. Bryan E. 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
   Texas Licensed Professional Engineer's Serial Number: 98920

Project Information

3. This project is for the construction or replacement of:

   ☐ Lift Station only.
   ☐ Lift Station and Force Main system.
   ☒ Lift Station, Force Main, and Gravity system.

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

☒ Existing
☐ Proposed

5. All components of this lift station/force main system will comply with:

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

Site Plan Requirements

Items 6-14 must be included on the Site Plan.

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

   Site Plan Scale: 1" = 20'.

7. ☒ Lift station/force main system layout meets all requirements of 30 TAC Chapter 217.

8. Geologic or Manmade Features:

☒ No geologic or manmade features were identified in the Geologic Assessment.
☐ All geologic or manmade features identified in the Geologic Assessment (caves, solution openings, sinkholes, fractures, joints, porous zones, etc.) which exist at the site of the proposed lift station and along the path(s) or within **50 feet of each side** of a proposed force main line are shown on the Site Plan and are listed in the table below. Designs used to protect the integrity of the sewer line crossing each feature are described and labeled on the attached page. A detailed design drawing for each feature is shown on Plan Sheet _____ of _____.
☐ No Geologic Assessment is required for this project.

Table 1 - Geologic or Manmade Features

Line	*Station to Station*	*Type of Feature*
	to	
	to	
	to	
	to	
	to	
	to	
	to	
	to	

9. ☒ Existing topographic contours are shown and labeled. The contour interval is 1 feet. (Contour interval must not be greater than 5 feet).

10. ☒ Finished topographic contours are shown and labeled. The contour interval is __1__ feet. (Contour interval must not be greater than 5 feet).

☐ Finished topographic contours will not differ from the existing topographic configuration and are not shown.

11. 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): _FEMA FIRM PANEL 48491C0280E, 9/26/08____

12. 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 manmade. (Do not include streets or concrete-lined channels constructed above sewer lines.)
☐ After construction is complete, all sections of the force main 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 2 - 5-Year Floodplain

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

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

If applicable, this must agree with Item No. 15 on the Geologic Assessment Form.
☐ 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 plugged.
☐ The wells are not in use and will be properly plugged.
☐ 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.

14. ☒ Legal boundaries of the site are shown.

Plan and Profile Sheets

*The construction drawings and technical specifications will not be considered for review unless they are the **final plans and technical specifications** which will be used by the contractor for bidding and construction.*

Items 15 – 18 must be included on the Plan and Profile sheets.

15. ☒ The equipment installation construction plans must have a minimum scale of 1" = 10'.

    Plan sheet scale: 1" = 40 '.

16. ☒ Locations, descriptions and elevations of all required equipment and piping for the lift station and force main are shown and labeled.

17. ☒ Air Release/Vacuum Valves will be provided at all peaks in elevation of the proposed force main. These locations are listed in the table below and labeled on the appropriate plan and profile sheets.

Table 3 - Air Release/Vacuum Valves

Line	*Station*	*Sheet*
CENTRAL LIFT STATION FORCE MAIN	5+05.55	192 of 218
		of
		of
		of
		of
		of

18. ☒ 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.

19. ☒ **Attachment A - Engineering Design Report**. An engineering design report with the following required items is attached:

    ☒ The report is dated, signed, and sealed by a Texas Licensed Professional Engineer.
    ☒ Calculations for sizing system.
    ☒ Pump head calculations, including, but not limited to, system head and pump capacity curves, head loss calculations, and minimum and maximum static head C values for normal and peak operational conditions.
    ☒ 100-year and 25-year flood considerations.
    ☒ Total lift station pumping capacity with the largest pump out of service.
    ☒ Type of pumps, including standby units.
    ☒ Type of pump controllers, including standby air supply for bubbler controllers, as applicable.

☒ Pump cycle time.
☒ Type of wet well ventilation; include number of air changes for mechanical ventilation.
☒ Minimum and maximum flow velocities for the force main.
☒ Lift station security.
☒ Lift station emergency provisions and reliability.

Administrative Information

20. ☒ Upon completion of the wet well excavation, a geologist must certify that the excavation was inspected for the presence of sensitive features and submit the signed, sealed, and dated certification to the appropriate regional office.

21. ☒ The TCEQ Lift Stations and Force Mains General Construction Notes (TCEQ-0591) are included on the General Notes Sheet of the Final Construction Plans for this lift station and/or force main system.

22. ☒ 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.

23. ☒ Any modification of this lift station/force main system 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 **Lift Station/Force Main 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)(3)(C) and 30 TAC Chapter 217, and prepared by:

Print Name of Licensed Professional Engineer: Mr. Bryan E. Moore, P.E.

Place engineer's seal here:

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER

Date: 05/07/2024

Signature of Licensed Professional Engineer:

ENGINEERING DESIGN REPORT

FOR

WASTEWATER LIFT STATION AND FORCE MAIN IMPROVEMENTS

SOMERSET HILLS, PHASES A-E

City of Georgetown

Williamson County, Texas

Job. No. 22226x-P67

Prepared By:
Steger & Bizzell Engineering, Inc.
1978 S. Austin Avenue
Georgetown, Texas 78626
(512) 930-9412

TABLE OF CONTENTS

ENGINEERING DESIGN REPORT
FOR
WASTEWATER LIFT STATION
AND FORCE MAIN IMPROVEMENTS
SOMERSET HILLS, PHASES A-E

I. ENGINEERING DESIGN INFORMATION

A. LIFT STATION DESIGN

The design of this facility is based on the Texas Commission on Environmental Quality Chapter 217 "Design Criteria for Sewerage Systems", the Texas Commission on Environmental Quality Chapter 217 "Edwards Aquifer" and good engineering practice. The lift station is designed as a duplex installation. The pumps will be automatically alternated to lead pump operation after each pump cycle. The pumps will be of submersible design with quick connect/disconnect hydraulic sealing collars to permit easy removal for servicing. The installation includes a hoisting mechanism to aid in pump removal. The pumps will be controlled by floats thus eliminating the need for bubbler controllers and backup air supplies. The wet well, as well as the valve vault, will be ventilated by means of a passive screened gooseneck vent pipe on the top of each structure. The bottom of the wet well is sloped at 1:1 to create a hopper shape to the pump intakes. The pumps are capable of passing a 2½" diameter sphere and have 3" suction and discharge openings. Running of the second pump concurrently with the first pump should only occur after a power outage when the wet well is full or on failure of the first pump to run when called. During normal operations, and even under peak flow conditions, only one pump would run. The lift station site is enclosed by a 8' chain link fence and lockable gates for security.

1. DESIGN PARAMETERS

Average Daily Flow – 360 capita x 100 gpcd = 36000 gpd = 25 gpm
Peak Factor – 3.57
Peak Daily Flow – 25 gpm x 3.57 = 89.25 gpm
Minimum Daily Flow – 64.2 gpm x 30% = 26.78 gpm
Infiltration - 0.674 gpm/acre x 5.77 acres = 4.0 gpm

2. PUMP SIZING

Given the above design parameters, each pump is sized as follows:

Peak Daily Flow – 89.25 gpm
Minimum pump size without a grinder per §217.61(j) - 120 gpm
Duplex installation at 120 gpm per pump

3. PUMP HEAD CALCULATIONS

The lift station head loss calculations are based on minimum and maximum pumping rates, minimum and maximum static heads, and C values of 100 and 140. See the following pages for calculations on each condition.

Total Dynamic Head at **120 gpm**, **max. static head** and **C=140**:

Max. Static Head	=	max. force main elev. - pumps off elev.
	=	936.00 – 887.00
	=	49.00 feet

Minor Losses:

1 - Swing Check Coefficient	2.50
1 - Gate Valve Coefficient	0.20
5 - S.R. Bend Coefficient	4.50
1 - Tee Side Outlet Coefficient	1.80
1 - Bell Entrance Coefficient	0.10
1 - Exit Coefficient	1.00
Enlargement Coefficient	0.00
Total Coefficient	10.23
Total Minor Losses	1.49 feet

Friction Loss per 1000 feet	9.18
Total friction loss	15.38 feet

Total Dynamic Head	=	Max. Static Head + Minor Losses + Friction Loss
	=	65.87 feet

(See Hazen-Williams Output, Directly behind this sheet)

Hazen-Williams Formula for Pipe Losses

Comment: SOMERSET HILLS PHASES A-E Sewage Lift Station Coordinates for minimum system curve

Flowrate (GPM)	-	120	Friction Loss per 1000'	=	9.18
C Value	-	140	Velocity (fps)	=	3.06
Pipe Dia. (Inches)	-	4	Total Friction Loss (ft)	=	15.38
Length of Pipe	-	1675	Minor Losses (ft)	=	1.49
Minor Loss Coefficient	-	10.23	Static Head (ft)	=	49
F.M. Discharge Elev.	-	936.00	Total Head Loss (ft)	=	65.87
Low Elevation	-	887.00	D1 = 3	D2 =	4

Minor Loss Coefficients

Fitting		Coeff.	Quantity	Fitting		Coeff.	Quantity
Globe V., Full	-	10.00		Tee, Straight Run	-	0.30	
Angle V., Full	-	5.00		Coupling	-	0.30	
Swing Check	-	2.50	1	45 Wye, Side Outlet	-	0.80	
Gate V., Full	-	0.20	1	45 Wye, Straight	-	0.30	
Gate V., 3/4	-	1.00		Square Entrance	-	0.50	
Gate V., 1/2	-	5.60		Bell Entrance	-	0.10	1
Gate V., 1/4	-	24.00		Re-entrant	-	0.90	
S.R. Bend	-	0.90	5	Exit	-	1.00	1
M.R. Bend	-	0.80		Butterfly Valve	-	0.80	
L.R. Bend	-	0.60		Cla-Valve	-	5.50	
45 Bend	-	0.40		Enlargement (D1/D2)	-	0.8	0.13
Return Bend	-	2.20		Contraction (D2/D1)	-	0	0.00
Tee, Side Outlet	-	1.80	1				

Enlargement	-	D1/D2	k factor	Contraction	-	D2/D1	k factor
		0.1	0.98			0.1	0.46
		0.2	0.92			0.2	0.45
		0.3	0.83			0.3	0.42
		0.4	0.71			0.4	0.40
		0.5	0.56			0.5	0.36
		0.6	0.41			0.6	0.28
		0.7	0.28			0.7	0.19
		0.8	0.13			0.8	0.10
		0.9	0.04			0.9	0.04

Total Dynamic Head at **120 gpm**, **min. static head** and **C=140**:

Min. Static Head	=	max. force main elev. - pump on elev.
	=	936 - 889
	=	47 feet

Minor Losses:

1 - Swing Check Coefficient	2.50
1 - Gate Valve Coefficient	0.20
5 - S.R. Bend Coefficient	4.50
1 - Tee Side Outlet Coefficient	1.80
1 - Bell Entrance Coefficient	0.10
1 - Exit Coefficient	1.00
Enlargement Coefficient	0.13
Total Coefficient	10.23
Total Minor Losses	1.49 feet

Friction Loss per 1000 feet	9.18
Total friction loss	15.38 feet

Total Dynamic Head	=	Max. Static Head + Minor Losses + Friction Loss
	=	63.87 feet

(See Hazen-Williams Output, Directly behind this sheet)

Hazen-Williams Formula for Pipe Losses

Comment: SOMERSET HILLS PHASES A-E Sewage Lift Station Coordinates for minimum system curve

Flowrate (GPM)	-	120	Friction Loss per 1000'	=	9.18
C Value	-	140	Velocity (fps)	=	3.06
Pipe Dia. (Inches)	-	4	Total Friction Loss (ft)	=	15.38
Length of Pipe	-	1675	Minor Losses (ft)	=	1.49
Minor Loss Coefficient	-	10.23	Static Head (ft)	=	47
F.M. Discharge Elev.	-	936.00	Total Head Loss (ft)	=	63.87
Low Elevation	-	889.00	D1 = 3	D2 =	4

Minor Loss Coefficients

Fitting		Coeff.	Quantity	Fitting		Coeff.	Quantity
Globe V., Full	-	10.00		Tee, Straight Run	-	0.30	
Angle V., Full	-	5.00		Coupling	-	0.30	
Swing Check	-	2.50	1	45 Wye, Side Outlet	-	0.80	
Gate V., Full	-	0.20	1	45 Wye, Straight	-	0.30	
Gate V., 3/4	-	1.00		Square Entrance	-	0.50	
Gate V., 1/2	-	5.60		Bell Entrance	-	0.10	1
Gate V., 1/4	-	24.00		Re-entrant	-	0.90	
S.R. Bend	-	0.90	5	Exit	-	1.00	1
M.R. Bend	-	0.80		Butterfly Valve	-	0.80	
L.R. Bend	-	0.60		Cla-Valve	-	5.50	
45 Bend	-	0.40		Enlargement (D1/D2)	-	0.8	0.13
Return Bend	-	2.20		Contraction (D2/D1)	-	0	0.00
Tee, Side Outlet	-	1.80	1				

Enlargement -	D1/D2	k factor	Contraction -	D2/D1	k factor
	0.1	0.98		0.1	0.46
	0.2	0.92		0.2	0.45
	0.3	0.83		0.3	0.42
	0.4	0.71		0.4	0.40
	0.5	0.56		0.5	0.36
	0.6	0.41		0.6	0.28
	0.7	0.28		0.7	0.19
	0.8	0.13		0.8	0.10
	0.9	0.04		0.9	0.04

Total Dynamic Head at **120 gpm**, **max. static head** and **C=100**:

Max. Static Head	=	max. force main elev. - pumps off elev.
	=	936.00-887.00
	=	49.00 feet

Minor Losses:

1 - Swing Check Coefficient	2.50
1 - Gate Valve Coefficient	0.20
5 - S.R. Bend Coefficient	4.50
1 - Tee Side Outlet Coefficient	1.80
1 - Bell Entrance Coefficient	0.10
1 - Exit Coefficient	1.00
Enlargement Coefficient	0.13
Total Coefficient	10.23
Total Minor Losses	1.49 feet

Friction Loss per 1000 feet	17.12
Total friction loss	28.67 feet

Total Dynamic Head	=	Max. Static Head + Minor Losses + Friction Loss
	=	79.17 feet

(See Hazen-Williams Output, Directly behind this sheet)

Hazen-Williams Formula for Pipe Losses

Comment: SOMERSET HILLS PHASES A-E
Sewage Lift Station
Coordinates for minimum system curve

Flowrate (GPM)	-	120	Friction Loss per 1000'	=	17.12
C Value	-	100	Velocity (fps)	=	3.06
Pipe Dia. (Inches)	-	4	Total Friction Loss (ft)	=	28.67
Length of Pipe	-	1675	Minor Losses (ft)	=	1.49
Minor Loss Coefficient	-	10.23	Static Head (ft)	=	49
F.M. Discharge Elev.	-	936.00	Total Head Loss (ft)	=	79.17
Low Elevation	-	887.00	D1 = 3	D2 =	4

Minor Loss Coefficients

Fitting	Coeff.	Quantity	Fitting	Coeff.	Quantity
Globe V., Full -	10.00		Tee, Straight Run -	0.30	
Angle V., Full -	5.00		Coupling -	0.30	
Swing Check -	2.50	1	45 Wye, Side Outlet -	0.80	
Gate V., Full -	0.20	1	45 Wye, Straight -	0.30	
Gate V., 3/4 -	1.00		Square Entrance -	0.50	
Gate V., 1/2 -	5.60		Bell Entrance -	0.10	1
Gate V., 1/4 -	24.00		Re-entrant -	0.90	
S.R. Bend -	0.90	5	Exit -	1.00	1
M.R. Bend -	0.80		Butterfly Valve -	0.80	
L.R. Bend -	0.60		Cla-Valve -	5.50	
45 Bend -	0.40		Enlargement (D1/D2) -	0.8	0.13
Return Bend -	2.20		Contraction (D2/D1) -	0	0.00
Tee, Side Outlet -	1.80	1			

Enlargement -	D1/D2	k factor	Contraction -	D2/D1	k factor
	0.1	0.98		0.1	0.46
	0.2	0.92		0.2	0.45
	0.3	0.83		0.3	0.42
	0.4	0.71		0.4	0.40
	0.5	0.56		0.5	0.36
	0.6	0.41		0.6	0.28
	0.7	0.28		0.7	0.19
	0.8	0.13		0.8	0.10
	0.9	0.04		0.9	0.04

Total Dynamic Head at **120 gpm**, **min. static head** and **C=100**:

Max. Static Head	=	max. force main elev. - pumps off elev.
	=	936.00 – 889.00
	=	47.00 feet

Minor Losses:

1 - Swing Check Coefficient	2.50
1 - Gate Valve Coefficient	0.20
5 - S.R. Bend Coefficient	4.50
1 - Tee Side Outlet Coefficient	1.80
1 - Bell Entrance Coefficient	0.10
1 - Exit Coefficient	1.00
Enlargement Coefficient	0.13
Total Coefficient	10.23
Total Minor Losses	1.49 foot

Friction Loss per 1000 feet	17.12
Total friction loss	28.67 feet

Total Dynamic Head	=	Max. Static Head + Minor Losses + Friction Loss
	=	77.17 feet

(See Hazen-Williams Output, Directly behind this sheet)

Hazen-Williams Formula for Pipe Losses

Comment:	SOMERSET HILLS PHASES A-E Sewage Lift Station Coordinates for minimum system curve			
Flowrate (GPM)	- 120	Friction Loss per 1000'	=	17.12
C Value	- 100	Velocity (fps)	=	3.06
Pipe Dia. (Inches)	- 4	Total Friction Loss (ft)	=	28.67
Length of Pipe	- 1675	Minor Losses (ft)	=	1.49
Minor Loss Coefficient	- 10.23	Static Head (ft)	=	47
F.M. Discharge Elev.	- 936.00	Total Head Loss (ft)	=	77.17
Low Elevation	- 889.00	D1 = 3	D2 =	4

Minor Loss Coefficients

Fitting	Coeff.	Quantity	Fitting	Coeff.	Quantity
Globe V., Full -	10.00		Tee, Straight Run -	0.30	
Angle V., Full -	5.00		Coupling -	0.30	
Swing Check -	2.50	1	45 Wye, Side Outlet -	0.80	
Gate V., Full -	0.20	1	45 Wye, Straight -	0.30	
Gate V., 3/4 -	1.00		Square Entrance -	0.50	
Gate V., 1/2 -	5.60		Bell Entrance -	0.10	1
Gate V., 1/4 -	24.00		Re-entrant -	0.90	
S.R. Bend -	0.90	5	Exit -	1.00	1
M.R. Bend -	0.80		Butterfly Valve -	0.80	
L.R. Bend -	0.60		Cla-Valve -	5.50	
45 Bend -	0.40		Enlargement (D1/D2) -	0.8	0.13
Return Bend -	2.20		Contraction (D2/D1) -	0	0.00
Tee, Side Outlet -	1.80	1			

Enlargement -	D1/D2	k factor	Contraction -	D2/D1	k factor
	0.1	0.98		0.1	0.46
	0.2	0.92		0.2	0.45
	0.3	0.83		0.3	0.42
	0.4	0.71		0.4	0.40
	0.5	0.56		0.5	0.36
	0.6	0.41		0.6	0.28
	0.7	0.28		0.7	0.19
	0.8	0.13		0.8	0.10
	0.9	0.04		0.9	0.04

Total Dynamic Head at **160 gpm**, **max. static head** and **C=140**:

Max. Static Head	=	max. force main elev. - pumps off elev.
	=	936.00 – 887.00
	=	49 feet

Minor Losses:

1 - Swing Check Coefficient	2.50
1 - Gate Valve Coefficient	0.20
5 - S.R. Bend Coefficient	4.50
1 - Tee Side Outlet Coefficient	1.80
1 - Bell Entrance Coefficient	0.10
1 - Exit Coefficient	1.00
Enlargement Coefficient	0.13
Total Coefficient	10.23
Total Minor Losses	2.65 feet

Friction Loss per 1000 feet	15.64
Total friction loss	26.20 feet

Total Dynamic Head	=	Max. Static Head + Minor Losses + Friction Loss
	=	77.85 feet

(See Hazen-Williams Output, Directly behind this sheet)

Hazen-Williams Formula for Pipe Losses

Comment: SOMERSET HILLS PHASES A-E Sewage Lift Station Coordinates for minimum system curve

Flowrate (GPM)	-	160	Friction Loss per 1000'	=	15.64
C Value	-	140	Velocity (fps)	=	4.09
Pipe Dia. (Inches)	-	4	Total Friction Loss (ft)	=	26.20
Length of Pipe	-	1675	Minor Losses (ft)	=	2.65
Minor Loss Coefficient	-	10.23	Static Head (ft)	=	49
F.M. Discharge Elev.	-	936.00	Total Head Loss (ft)	=	77.85
Low Elevation	-	887.00	D1 = 3	D2 =	4

Minor Loss Coefficients

Fitting	Coeff.	Quantity	Fitting	Coeff.	Quantity
Globe V., Full -	10.00		Tee, Straight Run -	0.30	
Angle V., Full -	5.00		Coupling -	0.30	
Swing Check -	2.50	1	45 Wye, Side Outlet -	0.80	
Gate V., Full -	0.20	1	45 Wye, Straight -	0.30	
Gate V., 3/4 -	1.00		Square Entrance -	0.50	
Gate V., 1/2 -	5.60		Bell Entrance -	0.10	1
Gate V., 1/4 -	24.00		Re-entrant -	0.90	
S.R. Bend -	0.90	5	Exit -	1.00	1
M.R. Bend -	0.80		Butterfly Valve -	0.80	
L.R. Bend -	0.60		Cla-Valve -	5.50	
45 Bend -	0.40		Enlargement (D1/D2) -	0.8	0.13
Return Bend -	2.20		Contraction (D2/D1) -	0	0.00
Tee, Side Outlet -	1.80	1			

Enlargement -	D1/D2	k factor	Contraction -	D2/D1	k factor
	0.1	0.98		0.1	0.46
	0.2	0.92		0.2	0.45
	0.3	0.83		0.3	0.42
	0.4	0.71		0.4	0.40
	0.5	0.56		0.5	0.36
	0.6	0.41		0.6	0.28
	0.7	0.28		0.7	0.19
	0.8	0.13		0.8	0.10
	0.9	0.04		0.9	0.04

Total Dynamic Head at **160 gpm**, **min. static head** and **C=140**:

Min. Static Head	=	max. force main elev. - pump on elev.
	=	936.00 – 889.00
	=	47.00 feet

Minor Losses:

1 - Swing Check Coefficient	2.50
1 - Gate Valve Coefficient	0.20
5 - S.R. Bend Coefficient	4.50
1 - Tee Side Outlet Coefficient	1.80
1 - Bell Entrance Coefficient	0.10
1 - Exit Coefficient	1.00
Enlargement Coefficient	0.13
Total Coefficient	10.23
Total Minor Losses	2.65 feet

Friction Loss per 1000 feet	15.64
Total friction loss	26.20 feet

Total Dynamic Head	=	Max. Static Head + Minor Losses + Friction Loss
	=	75.85 feet

(See Hazen-Williams Output, Directly behind this sheet)

Hazen-Williams Formula for Pipe Losses

Comment:	SOMERSET HILLS PHASES A-E Sewage Lift Station Coordinates for minimum system curve				
Flowrate (GPM)	-	160	Friction Loss per 1000'	=	15.64
C Value	-	140	Velocity (fps)	=	4.09
Pipe Dia. (Inches)	-	4	Total Friction Loss (ft)	=	26.20
Length of Pipe	-	1675	Minor Losses (ft)	=	2.65
Minor Loss Coefficient	-	10.23	Static Head (ft)	=	47
F.M. Discharge Elev.	-	936.00	Total Head Loss (ft)	=	75.85
Low Elevation	-	889.00	D1 = 3	D2 =	4

Minor Loss Coefficients

Fitting	Coeff.	Quantity	Fitting	Coeff.	Quantity
Globe V., Full -	10.00		Tee, Straight Run -	0.30	
Angle V., Full -	5.00		Coupling -	0.30	
Swing Check -	2.50	1	45 Wye, Side Outlet -	0.80	
Gate V., Full -	0.20	1	45 Wye, Straight -	0.30	
Gate V., 3/4 -	1.00		Square Entrance -	0.50	
Gate V., 1/2 -	5.60		Bell Entrance -	0.10	1
Gate V., 1/4 -	24.00		Re-entrant -	0.90	
S.R. Bend -	0.90	5	Exit -	1.00	1
M.R. Bend -	0.80		Butterfly Valve -	0.80	
L.R. Bend -	0.60		Cla-Valve -	5.50	
45 Bend -	0.40		Enlargement (D1/D2) -	0.8	0.13
Return Bend -	2.20		Contraction (D2/D1) -	0	0.00
Tee, Side Outlet -	1.80	1			

Enlargement -	D1/D2	k factor	Contraction -	D2/D1	k factor
	0.1	0.98		0.1	0.46
	0.2	0.92		0.2	0.45
	0.3	0.83		0.3	0.42
	0.4	0.71		0.4	0.40
	0.5	0.56		0.5	0.36
	0.6	0.41		0.6	0.28
	0.7	0.28		0.7	0.19
	0.8	0.13		0.8	0.10
	0.9	0.04		0.9	0.04

Total Dynamic Head at **160 gpm**, **max. static head** and **C=100**:

Max. Static Head	=	max. force main elev. - pumps off elev.
	=	936.00 – 887.00
	=	49.00 feet

Minor Losses:

1 - Swing Check Coefficient	2.50
1 - Gate Valve Coefficient	0.20
5 - S.R. Bend Coefficient	4.50
1 - Tee Side Outlet Coefficient	1.80
1 - Bell Entrance Coefficient	0.10
1 - Exit Coefficient	1.00
Enlargement Coefficient	0.13
Total Coefficient	10.23
Total Minor Losses	2.62 feet

Friction Loss per 1000 feet	29.16
Total friction loss	48.85 feet

Total Dynamic Head	=	Max. Static Head + Minor Losses + Friction Loss
	=	100.50 feet

(See Hazen-Williams Output, Directly behind this sheet)

Hazen-Williams Formula for Pipe Losses

Comment:	SOMERSET HILLS PHASES A-E Sewage Lift Station Coordinates for minimum system curve				
Flowrate (GPM)	-	160	Friction Loss per 1000'	=	29.16
C Value	-	100	Velocity (fps)	=	4.09
Pipe Dia. (Inches)	-	4	Total Friction Loss (ft)	=	48.85
Length of Pipe	-	1675	Minor Losses (ft)	=	2.65
Minor Loss Coefficient	-	10.23	Static Head (ft)	=	49
F.M. Discharge Elev.	-	936.00	Total Head Loss (ft)	=	100.50
Low Elevation	-	887.00	D1 = 3	D2 =	4

Minor Loss Coefficients

Fitting		Coeff.	Quantity	Fitting	Coeff.	Quantity
Globe V., Full	-	10.00		Tee, Straight Run -	0.30	
Angle V., Full	-	5.00		Coupling -	0.30	
Swing Check	-	2.50	1	45 Wye, Side Outlet -	0.80	
Gate V., Full	-	0.20	1	45 Wye, Straight -	0.30	
Gate V., 3/4	-	1.00		Square Entrance -	0.50	
Gate V., 1/2	-	5.60		Bell Entrance -	0.10	1
Gate V., 1/4	-	24.00		Re-entrant -	0.90	
S.R. Bend	-	0.90	5	Exit -	1.00	1
M.R. Bend	-	0.80		Butterfly Valve -	0.80	
L.R. Bend	-	0.60		Cla-Valve -	5.50	
45 Bend	-	0.40		Enlargement (D1/D2) -	0.8	0.13
Return Bend	-	2.20		Contraction (D2/D1) -	0	0.00
Tee, Side Outlet	-	1.80	1			

Enlargement -	D1/D2	k factor	Contraction -	D2/D1	k factor
	0.1	0.98		0.1	0.46
	0.2	0.92		0.2	0.45
	0.3	0.83		0.3	0.42
	0.4	0.71		0.4	0.40
	0.5	0.56		0.5	0.36
	0.6	0.41		0.6	0.28
	0.7	0.28		0.7	0.19
	0.8	0.13		0.8	0.10
	0.9	0.04		0.9	0.04

Total Dynamic Head at **160 gpm**, **min. static head** and **C=100**:

Max. Static Head	=	max. force main elev. - pumps off elev.
	=	936.00 – 887.00
	=	49 feet

Minor Losses:

1 - Swing Check Coefficient	2.50
1 - Gate Valve Coefficient	0.20
5 - S.R. Bend Coefficient	4.50
1 - Tee Side Outlet Coefficient	1.80
1 - Bell Entrance Coefficient	0.10
1 - Exit Coefficient	1.00
Enlargement Coefficient	0.13
Total Coefficient	10.23
Total Minor Losses	2.62 feet

Friction Loss per 1000 feet	29.16
Total friction loss	48.85 feet

Total Dynamic Head	=	Max. Static Head + Minor Losses + Friction Loss
	=	98.50 feet

(See Hazen-Williams Output, Directly behind this sheet)

Hazen-Williams Formula for Pipe Losses

		SOMERSET HILLS PHASES			
Comment:		A-E			
		Sewage Lift Station			
		Coordinates for minimum system curve			
Flowrate (GPM)	-	160	Friction Loss per 1000'	=	29.16
C Value	-	100	Velocity (fps)	=	4.09
Pipe Dia. (Inches)	-	4	Total Friction Loss (ft)	=	48.85
Length of Pipe	-	1675	Minor Losses (ft)	=	2.65
Minor Loss Coefficient	-	10.23	Static Head (ft)	=	47
F.M. Discharge Elev.	-	936.00	Total Head Loss (ft)	=	98.50
Low Elevation	-	889.00	D1 = 3	D2 =	4

Minor Loss Coefficients

Fitting	Coeff.	Quantity	Fitting	Coeff.	Quantity
Globe V., Full -	10.00		Tee, Straight Run -	0.30	
Angle V., Full -	5.00		Coupling -	0.30	
Swing Check -	2.50	1	45 Wye, Side Outlet -	0.80	
Gate V., Full -	0.20	1	45 Wye, Straight -	0.30	
Gate V., 3/4 -	1.00		Square Entrance -	0.50	
Gate V., 1/2 -	5.60		Bell Entrance -	0.10	1
Gate V., 1/4 -	24.00		Re-entrant -	0.90	
S.R. Bend -	0.90	5	Exit -	1.00	1
M.R. Bend -	0.80		Butterfly Valve -	0.80	
L.R. Bend -	0.60		Cla-Valve -	5.50	
45 Bend -	0.40		Enlargement (D1/D2) -	0.8	0.13
Return Bend -	2.20		Contraction (D2/D1) -	0	0.00
Tee, Side Outlet -	1.80	1			

Enlargement -	D1/D2	k factor	Contraction -	D2/D1	k factor
	0.1	0.98		0.1	0.46
	0.2	0.92		0.2	0.45
	0.3	0.83		0.3	0.42
	0.4	0.71		0.4	0.40
	0.5	0.56		0.5	0.36
	0.6	0.41		0.6	0.28
	0.7	0.28		0.7	0.19
	0.8	0.13		0.8	0.10
	0.9	0.04		0.9	0.04

5. WET WELL CALCULATIONS

The wet well capacity is based on design flow and provides a pump cycle time for submersible pump installations of not less than six minutes. The following calculations demonstrate this. Storage volume in the hopper area of the wet well is not considered in these calculations.

Normal condition, one pump running.

Volume Available:	Pump On Elev. -	889.00
	Pumps Off Elev. -	887.00
	Elevation Diff. -	2.00’
	Well Diameter -	6’
	Volume = $\pi r^2 d$ =	56.55 cubic feet
	=	423 gallons

Pump-down Time at 100 gpm
less daily average inflow = 423 gal. ÷ (120 gpm – 25 gpm)
= 4.45 minutes

Abnormal condition, Two pumps running.

Volume Available:	2 Pumps On Elev. -	891.00
	Pumps Off Elev. -	887.00
	Elevation Diff. -	4.00’
	Well Diameter -	6’
	Volume = $\pi r^2 d$ =	113.10 cubic feet
	=	846 gallons

Pump-down Time at 200 gpm
less peak inflow = 846 gal. ÷ (160 gpm – 25gpm)
= 6.27 minutes

The pump cycle time (from pump on, pump down, wet well filling to pump on) can be calculated as follows:

Normal condition, one pump running.

Pump-down time at 120 gpm less daily average inflow	=	4.45 minutes
Wet well fill time at daily average inflow	=	16.92 minutes
Normal condition cycle time	=	21.37 minutes

Abnormal condition, two pumps running.

Pump-down time at 240 gpm less peak inflow	=	6.27 minutes
Wet well fill time at peak inflow	=	9.48 minutes
Abnormal condition cycle time	=	15.75 minutes

6. WET WELL BUOYANCY

Archimedes' principle states that a solid body submerged in a fluid at rest is buoyed up by a force equal in magnitude to the weight of the displaced fluid. The resultant force on any submerged body equals the difference in the buoyant force and the weight of the body. Since the lift station is located directly adjacent to a stormwater detention facility, the possibility of the surrounding soil becoming saturated and exerting a buoyant force on the lift station wet well is high. The following calculations determine if there is sufficient downward force to counteract the buoyant force. The weight of concrete is assumed to be 148 lb/cf. The weight of installed equipment and the top slab is not considered.

Circular Wetwell

Inside Diameter of Wetwell	6.00	Feet
Elevation Top of Wetwell	904.50	
Thickness of Top	1.00	Feet
Elevation of Ground	904.00	
Tob Slab Elevation of Wetwell Bottom	885.00	
Thickness of Bottom Slab	1.00	Feet
Invert Elevation of Wetwell	884.00	
Length of Footer Beyond Wetwell Wall	1.00	Feet
Diameter of Bottom Slab	10.34	Feet
Inside Wetwell Radius	3.00	Feet
Wetwell Wall Thickness	1.17	Feet
Outside Wetwell Radius	4.17	Feet
Thickness of Bottom	1.00	Feet
Unit Weight of Concrete	148.00	Lb/Cub. Ft.
Unit Weight of Soil	110.00	Lb/Cub. Ft.
Unit Weight of Water	62.43	Lb/Cub. Ft.

Lift =	70,041	Pounds
Structure Weight =	88,487	Pounds
Buoyant Soil Weight above Footer =	26,520.6	Pounds
Safety Factor =	1.64	

Since the downward force (structure weight) and the soil weight above the footer is greater than the buoyant force (lift), the wet well will not float. A safety factor of 1.64 (Structure weight/lift) is above the recommended safety factor of 1.25 and is therefore satisfactory.

7. VALVE VAULT BUOYANCY

Since the lift station is located directly adjacent to a stormwater detention facility, the possibility of the surrounding soil becoming saturated and exerting a buoyant force on the lift station valve vault is high. The following calculations determine if there is sufficient downward force to counteract the buoyant force. The weight of concrete is assumed to be 148 lb/cf. The weight of installed equipment and top slab is not considered.

Circular Valve Vault

Inside Diameter of Valve Vault	6.00	Feet
Elevation Top of Valve Vault	904.50	
Thickness of Top	1.00	Feet
Elevation of Ground	904.00	
Tob Slab Elevation of Valve Vault Bottom	899.00	
Thickness of Bottom Slab	1.00	Feet
Invert Elevation of Valve Vault	898.00	
Length of Footer Beyond Valve Vault Wall	0.00	Feet
Diameter of Bottom Slab	8.34	Feet
Inside Valve Vault Radius	3.00	Feet
Valve Vault Wall Thickness	1.17	Feet
Outside Valve Vault Radius	4.17	Feet
Thickness of Bottom	1.00	Feet
Unit Weight of Concrete	148.00	Lb/Cub. Ft.
Unit Weight of Soil	110.00	Lb/Cub. Ft.
Unit Weight of Water	62.43	Lb/Cub. Ft.

Lift =	20,463	Pounds
Structure Weight =	29,538	Pounds
Buoyant Soil Weight above Footer =	0.0	Pounds
Safety Factor =	1.44	

Since the downward force (structure weight) is greater than the buoyant force (lift), the wet well will not float and a footer is not required. A safety factor of 1.44 (Structure weight/lift) is above the recommended safety factor of 1.25 and is therefore satisfactory.

8. HYDROGEN SULFIDE POTENTIAL

Force mains which flow full are not susceptible to corrosion attack. However, sulfide generated within a force main system due to continuous slime layer buildup, low velocities and intermittent operation could lead to odor problems.

Pomeroy's equation is used to predict sulfide buildup in the force main and resultant odor potential.

$$S = 3.28(t)(M)[EBOD](1+0.48r)r^{-1}$$

where: S = total sulfides, mg/l
t = force main flushing time, hrs., 2.46 minutes = 0.0401 hrs.
M = specific sulfide flux coefficient = 0.00075 meters/hr
r = hydraulic radius, ft. = .0833 ft.

$$[EBOD] = [BOD_5] \times 1.07^{(T-20)}$$

where: $[BOD_5]$ = 200 mg/l
T = temperature, C° = 21°C

$$[EBOD] = 200 \text{ mg/l} \times 1.07^{(21 - 20)} = 214 \text{ mg/l}$$

$$S = 0.27 \text{ mg/l}$$

Therefore, there is potential for sulfide generation. However, based on the City's past experience with lift stations of similar size, there are no odor measures proposed at this time. If, based on operational experience, there is need for odor control, the City will add an odor control system.

9. WATER HAMMER

Water hammer calculations at a flow of 120 gpm are calculated as follows:

Force main diameter = 4”
Pressure rating of PVC SDR-26 = 160 psi
Pipe wall thickness = 0.173”
Flow velocity = 3.06 fps

Determine resistance to cyclic fatigue.

Assumptions: Instantaneous flow velocity stoppage,
System working pressure = 79.17 feet TDH = 34.27 psi
Surge pressure = velocity x unit pressure surge = 3.05 x 14.4 = 44.00 psi
P = working pressure + surge pressure = 34.27 + 44.00 = 78.27 psi
S = P(DR - 1) ÷ 2 = 44.84(18 - 1) ÷ 2 = 291.30 psi peak hoop stress
C = $(5.05 \times 10^{21})S^{-4.906}$ = 4,104,287,384 pressure surge cycles to failure

Assume 50 years useful life of pipe, 4,104,287,384 cycles in 50 years = 224,892 maximum cycles per day. Therefore, there is no problem with cyclic failure.

Determine pressure wave velocity:

$$a = \frac{4660}{\sqrt{1 + (k(DR - 2))/E}}$$

where a = wave velocity, fps
k = fluid bulk modulus = 300,000 psi
DR = dimension ratio = 18
E = pipe elasticity modulus = 400,000 psi

a = 1,069.08 fps

Determine water hammer pressure:

P = (aV ÷ 2.31g) + system working pressure
= ((1,069.08 x 3.06) ÷ (2.31 x 32.2)) + 34.27 = 78.23 psi

Therefore, with a 160 psi rated pressure pipe and a water hammer pressure of 78.23 psi, there should be no problem with the pipe.

Determine minimum thrust blocking:

Minimum bearing area = W x H = Thrust/Load Bearing

Where: Bearing load = 2,000 lb/sf
Thrust = 2PA(sin ½θ), lbs
for 4" pipe, A = 12.57 sq. in.
P = 78.23 psi

Fitting	Thrust, lbs
Plug	1,967
90° Bend	1,391
45° Bend	753
22½° Bend	384

The thrust blocking sizes shown on the plan detail sheet are based on 2,000 lb/sf bearing load, pipe pressure of 150 psi and a 33% safety factor. Therefore, there should be no problem with thrust loads at horizontal or vertical fittings.

Water hammer calculations at a flow of 160 gpm are calculated as follows:

Force main diameter = 4”
Pressure rating of PVC SDR-26 = 160 psi
Pipe wall thickness = 0.173”
Flow velocity = 4.07 fps

Determine resistance to cyclic fatigue.

Assumptions: Instantaneous flow velocity stoppage,
System working pressure = 100.49 feet TDH = 43.51 psi
Surge pressure = velocity x unit pressure surge = 4.07 x 14.4 = 58.67 psi
P = working pressure + surge pressure = 68.60 + 88.01 = 102.18 psi
S = P(DR - 1) ÷ 2 = 87.75(18 - 1) ÷ 2 = 369.80 psi peak hoop stress
C = (5.05 x 10^{21})$S^{-4.906}$ = 1,272,975,101 pressure surge cycles to failure

Assume 50 years useful life of pipe, 1,272,975,101cycles in 50 years = 69,752.06 maximum cycles per day. Therefore, there is no problem with cyclic failure.

Determine pressure wave velocity:

$$a = \frac{4660}{\sqrt{1 + (k(DR - 2))/E}}$$

where a = wave velocity, fps
k = fluid bulk modulus = 300,000 psi
DR = dimension ratio = 18
E = pipe elasticity modulus = 400,000 psi

a = 1,069.08 fps

Determine water hammer pressure:

P = (aV ÷ 2.31g) + system working pressure
= ((1,069.08 x 4.07) ÷ (2.31 x 32.2)) + 43.51 = 102.12 psi

Therefore, with a 160 psi rated pressure pipe and a water hammer pressure of 102.12 psi, there should be no problem with the pipe.
water hammer pressure of 135.75 psi, there should be no problem with the pipe.

Determine minimum thrust blocking:

Minimum bearing area = W x H = Thrust/Load Bearing

Where: Bearing load = 2,000 lb/sf
Thrust = 2PA(sin ½θ), lbs
for 4" pipe, A = 12.57 sq. in.
P = 124.64 psi

Fitting	Thrust, lbs
Plug	2,567
90° Bend	1,815
45° Bend	982
22½° Bend	501

The thrust blocking sizes shown on the plan detail sheet are based on 2,000 lb/sf bearing load, pipe pressure of 150 psi and a 33% safety factor. Therefore, there should be no problem with thrust loads at horizontal or vertical fittings.

10. POWER OUTAGE MEASURES

Sewage spillage is a definite possibility during a power outage at lift stations. Power outages are usually limited to smaller areas of the electrical grid and rarely affect the entire system. The primary power source for this lift station will be provided by the City of Georgetown. The City of Georgetown also possesses a mobile generator. Additionally, some storage volume is available within the wet well and collection system. The following is a calculation of the volume available and approximate detention time before spillage based on design flow data. The wastewater retention capability exceeds a 120 minute worst case outage duration.

Wet well diameter	-	6'-0"
Depth between lowest top of upstream manhole and last pump "on"	-	15.57'
Wet well storage volume	-	4229.95 gallons
Length of available 8" collection pipe	-	1,468 l.f.
Collection pipe volume	-	3,834 gallons
MH vert. depth available	-	32 v.f.
MH volume	-	3,035 gallons
Total available volume	-	11,098 gallons
Time to spill at average flow, 25 gpm	-	443 minutes = 7.4 hours
Time to spill at peak flow, 89.25 gpm	-	124 minutes = 2.1 hours

B. FORCE MAIN DESIGN

The force main will be constructed of SDR-26 Pressure Class 160 except for portions in the immediate vicinity of the lift station and at the end of the force main at the transition manhole. The force main at these locations will be Ductile Iron C150 Pressure Class 350 to enable the force main to be pressure tested, see plans for details. The force main will be installed under pavement for the majority of its route. As a result, the grade will vary with the grade of the pavement and is indicated on the construction plan profiles. The high points are at the lift station, after a storm pipe crossing and at the connecting manhole. A air release valve will be installed at the pump station and at the location of the high point.

Force Main flushing calculations are as follows:

Volume of force main (V) = πr^2 x length x 7.48 gallons/cubic foot
= 1093.36 gallons

Flushing time, assuming 4.45 minute pump run time and one pump running for normal conditions.

Flush time = Volume of force main/(Pump rate x 4.45 minutes)
= 1,093 gallons/(120 gpm x 4.45 minutes)
= 2.45 minutes

Velocity at 120 gpm = 3.05 fps.
Velocity at 240 gpm = 4.07 fps.

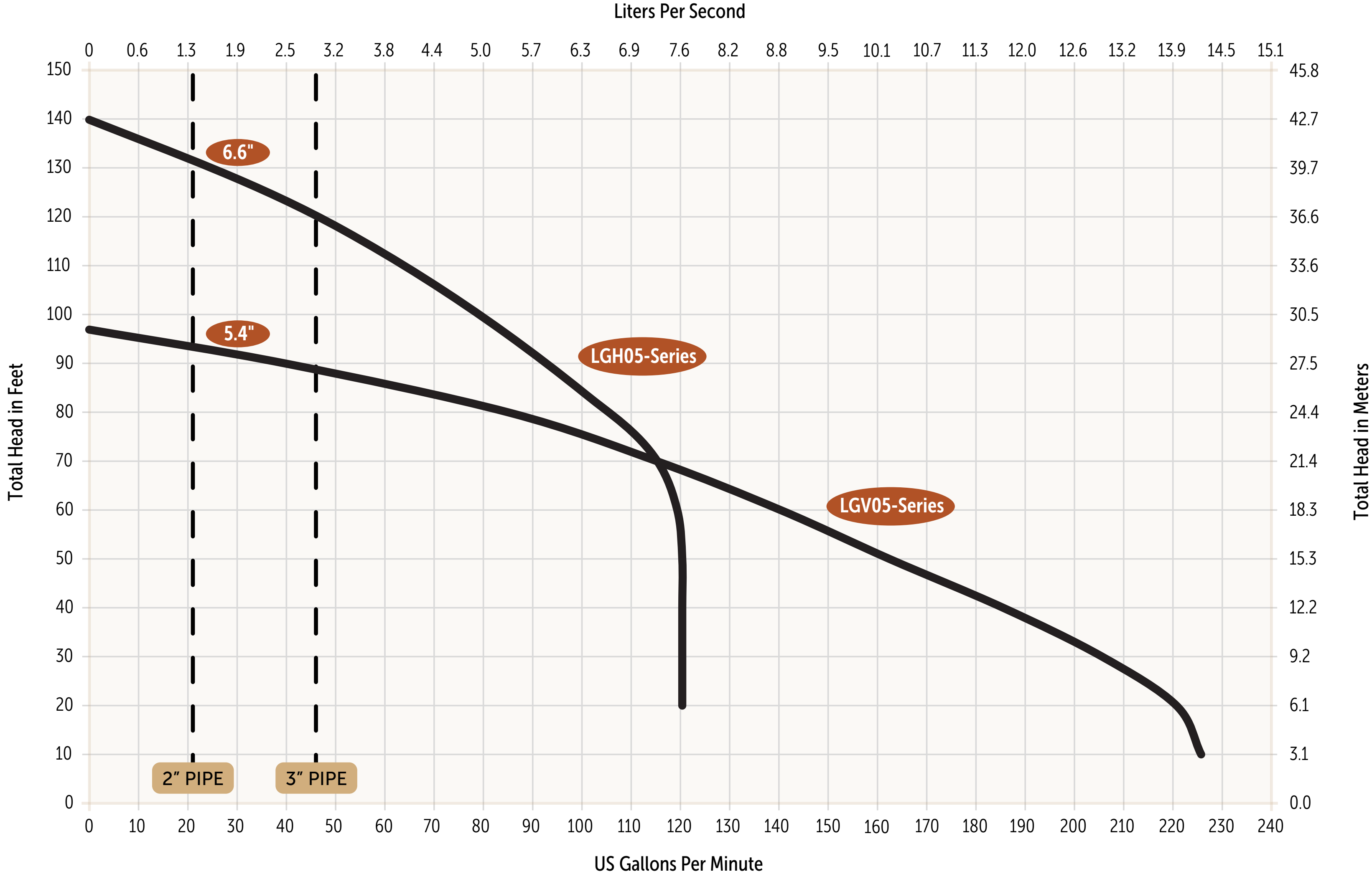
Exhibit 1

Pump Curve

Liberty Pumps® Engineered Products

Performance Curve

LGV05/LGH05-Series - 60 Hz



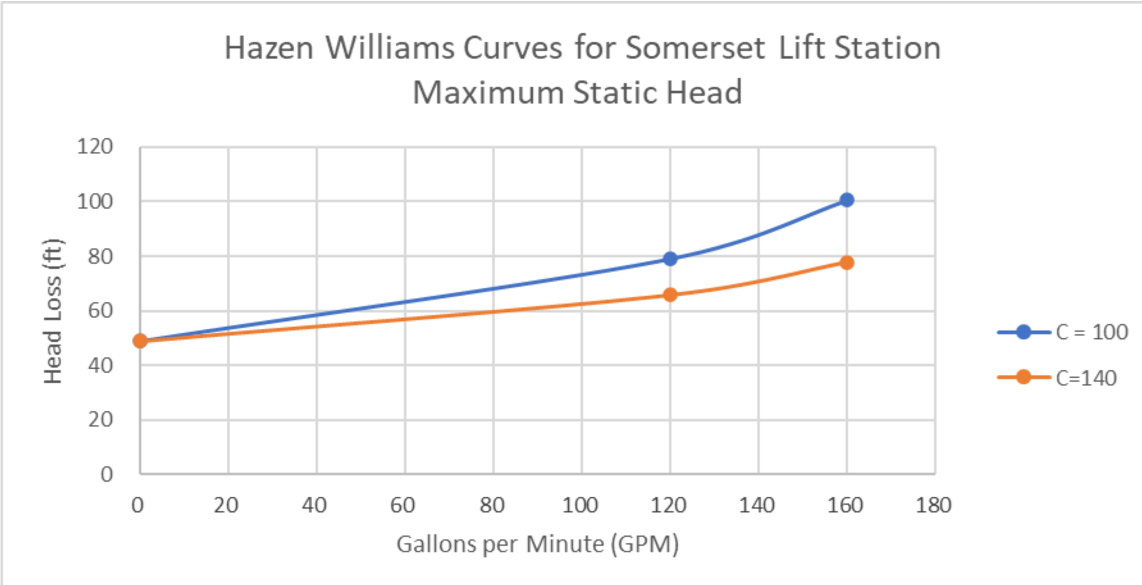
Pumps must operate within the proper range shown on the performance chart. It is the responsibility of the end user to ensure this requirement is met. Pumps operating outside the recommended range are prone to damage, excessive vibration, cavitation, poor efficiency, and may exceed nameplate amperage.

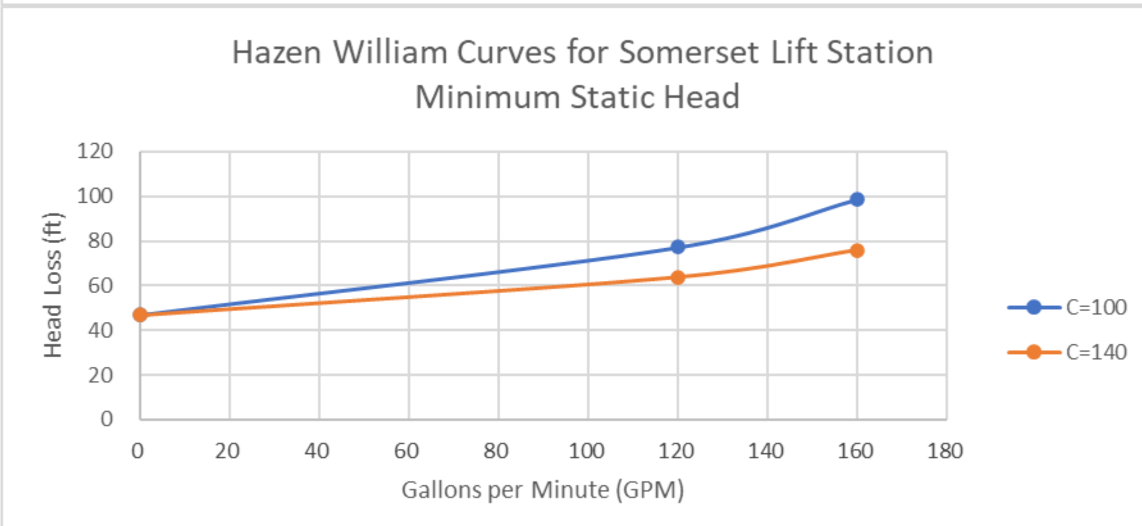
Specifications are subject to change without notice.

7000 Apple Tree Avenue - Bergen, NY 14416
Phone 800-543-2550 - Fax 585-494-1839 - www.LibertyPumps.com/LEP

Exhibit 2

System Curve


Hazen Williams Curves for Somerset Lift Station
Maximum Static Head
Head Loss (ft)
120
100
80
60
40
20
0
0
20
40
60
80
100
120
140
160
180
Gallons per Minute (GPM)
C = 100
C=140


Hazen William Curves for Somerset Lift Station
Minimum Static Head
Head Loss (ft)
120
100
80
60
40
20
0
0
20
40
60
80
100
120
140
160
180
Gallons per Minute (GPM)
C=100
C=140

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: Furman Tierra, LLC/ Steger Bizzell, Tyson L. Hasz, P.E.

Date: 5/6/2024

Signature of Customer/Agent:

Tyson Hasz

____

Regulated Entity Name: Somerset Hills 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: Berry Creek, Cowan Creek

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:

- [x] 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.
- [x] 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.
- [x] A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.
- [x] 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. [x] 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.
    - [x] There will be no temporary sealing of naturally-occurring sensitive features on the site.

9. [x] **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. [x] **Attachment G - Drainage Area Map**. A drainage area map supporting the following requirements is attached:

    - [x] 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.

TCEQ-0602 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.

TCEQ-0602 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

TCEQ-0602 Attachment C – Sequence of Major Activities

The following sequence of activities is suggested. The sequence of construction will take place in four phases. Phase ‘A’ will include proposed roads Thornbury Trail, Clevedon Place, Cardiff Place, Plymouth Grove, Silver Spur Boulevard, beginning of Shurton Crossing, and adjacent neighborhood. Phase ‘B’ will include proposed roads Port Isaac Court, Worcester Loop, Falmouth Court, Notley Court, and segments of Newport Pass, Shurton Crossing, and adjacent neighborhood. Phase ‘D’ will include proposed roads Caldicot Lane, St. Ives Court, Bideford Cove, Swansea Pass, segments of Newport Pass, and adjacent neighborhood. Phase ‘E’ will include proposed roads Highbridge Trail, Bridgend Cove, and Minehead Road. 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 sedimentation controls and stabilized construction entrance. (Phase A area = 42.15 acres), (Phase B area = 43.92 acres), (Phase D area = 26.27 acres), (Phase E area = 20.97 acres).
2. Excavation will take place where the temporary sediment ponds, roads, parking, 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 = 42.15 acres), (Phase B area = 43.92 acres), (Phase D area = 26.27 acres), (Phase E area = 22.34 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 = 42.15 acres), (Phase B area = 43.92 acres), (Phase D area = 26.27 acres), (Phase E area = 22.34 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, ponds and building pads. (Phase A area = 42.15 acres), (Phase B area = 43.92 acres), (Phase D area = 26.27 acres), (Phase E area = 22.34 acres).
5. Paving of the site will consist of the roads, driveways and sidewalks being concrete. (Phase A area = 42.15 acres), (Phase B area = 43.92 acres), (Phase D area = 26.27 acres), (Phase E area = 22.34 acres).
6. After the roads, driveways, and sidewalk are installed, finish grading around the site will be completed. (Phase A area = 42.15 acres), (Phase B area = 43.92 acres), (Phase D area = 26.27 acres), (Phase E area = 22.34 acres).
7. Subsequent to the construction of the roads, driveways, building pads, etc., disturbed areas will be hydro-mulched or seeded. (Phase A area = 11.03 acres), (Phase B area = 12.32 acres), (Phase D area = 13.12 acres), (Phase E area = 17.01 acres).
8. Once vegetation is established on the site, Temporary BMPs will be removed as allowed by the engineer.

TCEQ-0602 Attachment D – Temporary Best Management Practices and Measures

The following sequence of activities is suggested. The sequence of construction will take place in four phases. 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, contractor staging and storage area, stabilized construction entrance, and a concrete washout area as erosion and sedimentation control measures**. The project will be constructed in four phases, Phases A, B, D, and E.
2. A protective setback buffer will be placed around sensitive geologic features. Orange silt fence will be utilized as the control measure just beyond the buffer. (Phase A= F-16, Phase E=F-24, F-25, F-26, F-27)
3. Excavation will take place where the roads, utilities, and building pads will be situated. **Ponds A (in Phase A), B (in Phase B), C (in Phase D), and D (in Phase E) will be rough graded to provide sediment containment during construction**. 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 will be utilized as the control measures.**
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 ponds, roads, culverts and building pads. **Silt fence will be utilized as the control measures.**
5. 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, BMPs, and storm sewer extensions and connections. **Silt fence, rock berm and inlet protection will be utilized as the control measures**.
6. 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**.
7. Once vegetation is established on the site, Temporary BMPs will be removed as allowed by the engineer.

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 or the aquifer.

TCEQ-0602 Attachment E – Request to Temporarily Seal a Feature

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

TCEQ-0602 Attachment F – Structural Practices

Ponds A, B, C, and D will be constructed to act as temporary sediment basins during construction activities. Construction will also be phased to minimize disturbed areas. Silt fences and rock berms 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.

TCEQ-0602 Attachment G – Drainage Area Map

See the Attached Somerset Hills Phases A-E construction plans for existing and proposed drainage area maps.

TCEQ-0602 Attachment H – Temporary Sediment Pond(s) Plan and Calculations

WQ Pond
(Sediment Trap)

Construction Phase - Temporary Sediment Basin A			
Elevation [ft]	Area [s.f.]	Avg End Incremental Volume [c.f.]	Avg End Cumulative Volume [c.f.]
887.08	0	0	0.00
888	12516.8	5758	5,757.73
889	27135.8	19826	25,584.03
890	31360.4	29248	54,832.13
891	34107.0	32734	87,565.83
892	36938.1	35523	123,088.38
893	39853.6	38396	161,484.23
894	42853.7	41354	202,837.88
895	45938.25	44396	247,276.08
3,000 Ft^3/Ac		Required =	126,534.00

Construction Phase - Temporary Sediment Basin B			
Elevation [ft]	Area [s.f.]	Avg End Incremental Volume [c.f.]	Avg End Cumulative Volume [c.f.]
895.36	0	0	0.00
896	6837	2188	2,187.81
897	36,205	21521	23,708.91
898	67,995	52100	75,809.16
899	76,384	37715	149,142.21
900	80,285	78334	227,476.46
901	84,322	82303	309,779.76
902	88,504	86413	396,192.71
903	92,803	90653	486,846.11
904	99,863	96333	583,179.01
905	104,116	288930	685,123.16
906	108,436	106276	791,399.41
3,000 Ft^3/Ac		Required =	151,917.00

Construction Phase - Temporary Sediment Basin C			
Elevation [ft]	**Area [s.f.]**	**Avg End Incremental Volume [c.f.]**	**Avg End Cumulative Volume [c.f.]**
847	25	0	0.00
848	6481	3253	3,253.00
849	14007.2857	10244	13,497.14
850	16498.9442	15253	28,750.26
851	19091.0055	17795	46,545.23
852	23934.094	21513	68,057.78
853	26113.8765	25024	93,081.77
854	28368.2469	27241	120,322.83
3,000 Ft^3/Ac		Required =	61,728.00

Construction Phase - Temporary Sediment Basin D			
Elevation [ft]	**Area [s.f.]**	**Avg End Incremental Volume [c.f.]**	**Avg End Cumulative Volume [c.f.]**
834	25	0	0.00
835	12846	6436	6,435.66
836	14219	13532	19,968.10
837	15659	14939	34,906.80
838	16503	16081	50,987.92
839	18741	17622	68,610.11
3,000 Ft^3/Ac		Required =	59,298.00

TCEQ-0602 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

Temporary BMP Logs – Rock Berm

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

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

<u>**Temporary BMP Logs – Contractor Staging and Storage Area**</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 – Concrete Washout Area

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 – Stabilized 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

TCEQ-0602 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: Furman Tierra, LLC/ Steger Bizzell, Tyson L. Hasz, P.E.

Date: 5/6/2024

Signature of Customer/Agent

Tyson Hasz

____

Regulated Entity Name: Somerset Hills Phase 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

TCEQ-0600 Attachment B – BMPs for Upgradient Stormwater

Pond A will receive 15.55 acres of upgradient stormwater that will be routed into it by a series of storm sewers. This upgradient area is evaluated at 0% impervious cover. Likewise, Pond B will receive 7.35 acres of upgradient stormwater via a series of storm sewers. This upgradient area is also evaluated at 0% impervious cover. Pond C will receive 3.01 acres of upgradient stormwater. Of this 3.01 acres, 2.28 acres of this is evaluated at 0% impervious cover. The remaining 0.73 acres of upgradient stormwater which will flow to Pond C is from right-of-way in Phase B for which overtreatment is being provided in Pond B. So rather than being evaluated at 80% impervious cover in Pond C, it is being evaluated at an effective impervious cover of 0%.

TCEQ-0600 Attachment C – BMPs for On-site Stormwater

Development of Somerset Hills Phases A-E is limited to 45-percent cumulative impervious cover, therefore development of the property is based on these impervious cover limitations. The batch detention ponds (Pond A, Pond B, Pond C, and Pond D) have been designed for 91-percent removal. Pond A will provide treatment to an onsite area of 29.27 acres, as well as to an additional 15.55 acres that drains onto the site from the north for a total basin area of 44.82 acres. Furthermore, overtreatment will be provided by this pond for 0.26 acres of offsite pavement being constructed for access to the site and for 0.22 acres of onsite area that drain offsite giving the pond an *effective* basin area of 45.30 acres. Pond B will provide treatment to an onsite area of 38.68 acres, as well as to an additional 7.35 acres that drains onto the site from the northwest and from the south for a total basin area of 46.03 acres. Furthermore, overtreatment will be provided for 0.59 acres of pavement onsite that does not drain to the pond and for 0.29 acres of offsite site pavement being constructed for access to the site giving the pond an *effective* basin area of 46.91 acres. Pond C will provide treatment to an area of 12.72 acres, as well as to an additional 3.01 acres that drains onto the site from the west for a total basin area of 15.73 acres. However, 0.73 acres of that will also be overtreated for in Pond B giving that 0.73 acres an effective impervious cover of 0%. Pond C will provide overtreatment for 0.12 acres of pavement being constructed for access to the site. Pond D will provide treatment to an area of 7.17 acres. In addition, it will provide overtreatment for 0.22 acres of pavement being constructed to provide access to the site giving the pond an effective basin area of 7.39 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.

TCEQ-0600 Attachment D – BMPs for Surface Streams

There are sensitive geologic features in Phases A and E of this project. Phase A has feature F-16, as described in the GA, and requires a 50-foot setback. It is located within an open space and drainage easement lot for protection. Phase E has sensitive features F-24, F-25, F-26 and F-27. Features F-24 and F-27 require a minimum 50-foot setback from the bedding plane and are located within open space and drainage easement lots for protection.

Known caves F-25 and F-26 include a protective buffer zone extending 50-feet in all directions from the footprint plus the cave watershed catchment up to 200 feet from the footprint. These two features are located within a parkland dedication lot for protection. F-25 is gated and the F-26 opening is obstructed by a large rock, which would prevent entry.

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.

TCEQ-0600 Attachment E – Request to Seal Features

There are no sensitive features that require sealing.

TCEQ-0600 Attachment F – Construction Plans

See Attached Somerset Hills Phases A-E Construction Plans

TCEQ-0600 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 will be documented in inspection reports. Inspection reports will be available to TCEQ upon request. 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 regrading 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 ensure 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*. Inspections will be documented in inspection reports. Inspection reports will be available to TCEQ upon request. 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 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 **Somerset Hills Phases A-E Filter Strips and Somerset Hills Phases A-E 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:
Albert V. Furman III
61A6D227ACC344B...

5/7/2024

Albert V. Furman
Furman Tierra, LLC

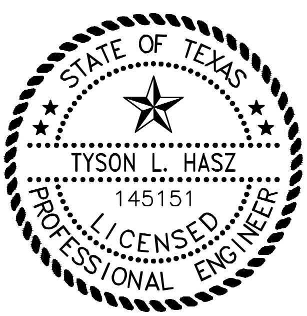
Date

DocuSigned by:
Tyson Hasz
4CB8339714AD4D0...

5/7/2024

Tyson L. Hasz, 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 Albert V. Furman III,
Print Name

Managing Member,
Title - Owner/President/Other

of Furman Tierra, LLC,
Corporation/Partnership/Entity Name

have authorized Mr. Tyson L. Hasz, 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:
Albert V. Furman III
Applicant's Signature

5/7/2024
Date

THE STATE OF TEXAS §

County of Travis §

BEFORE ME, the undersigned authority, on this day personally appeared Mr. Albert V. Furman III 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 7th day of May, 2024.

KIMBER MATOCHA
Notary Public, State of Texas
Comm. Expires 08-03-2024
Notary ID 6675074

DocuSigned by:
Kimber Matocha
NOTARY PUBLIC

Kimber Matocha
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 08-03-2024

NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM ANY INSTRUMENT THAT TRANSFERS AN INTEREST IN REAL PROPERTY BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

SPECIAL WARRANTY DEED

THE STATE OF TEXAS	§	
	§	KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF WILLIAMSON	§	

THAT AARONSON TIERRA LLC, a Texas limited liability company, and FURMAN TIERRA LLC, a Texas limited liability company (collectively, "**Grantor**"), for and in consideration of the sum of Ten and No/100 Dollars ($10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, has GRANTED, CONVEYED, ASSIGNED AND DELIVERED and by these presents does GRANT, CONVEY, ASSIGN AND DELIVER, unto PLAZO TIERRA LLC, a Texas limited liability company ("**Grantee**"), whose address is P.O. Box 41805, Austin, Texas 78704, the real property situated in Williamson County, Texas and described in **Exhibit A** attached hereto and made a part hereof for all purposes (the "**Land**"), together with any and all improvements located thereon, and together with all and singular the rights, benefits, privileges, easements, hereditaments and appurtenances thereof or in anywise appertaining to the Land or the improvements located thereon (the Land and all such improvements, rights, benefits, privileges, easements, hereditaments, appurtenances, and interests being hereinafter referred to as the "**Property**").

TO HAVE AND TO HOLD the Property unto Grantee, its successors and assigns forever, subject to the Permitted Encumbrances (defined below); and Grantor does hereby bind itself, its successors and assigns, to warrant and forever defend all and singular the Property, unto Grantee and its successors and assigns, against every person whomsoever, lawfully claiming or to claim the same or any part thereof by, through or under Grantor, but not otherwise, subject to the Permitted Encumbrances.

This conveyance is made by Grantor and accepted by Grantee subject to any and all easements, covenants, leases, rights-of-way, conditions, restrictions, outstanding mineral interests and royalty interests, if any, relating to the Property, to the extent, and only to the extent, that the same may still be in force and effect, and either shown of record in the Official Public Records of Williamson County, Texas, or that may be apparent on the Property (collectively, the "**Permitted Encumbrances**").

For the same consideration recited above, Grantor hereby GRANTS, CONVEYS, ASSIGNS AND DELIVERS unto Grantee without warranty, express or implied, all right, title and interest of Grantor, if any, in and to (i) strips or gores between the Property and abutting or immediately adjacent properties, and (ii) any land lying in or under the bed of any street, alley, road or right-of-way, opened or proposed, abutting or immediately adjacent to the Property.

Ad valorem taxes on the Property for the current and subsequent years are hereby assumed by Grantee.

[*The remainder of this page intentionally left blank; signature page immediately follows.*]

EXECUTED by Grantor on the dates set forth in the respective acknowledgements below to be effective as of March 20th, 2024.

GRANTOR:

AARONSON TIERRA LLC,
a Texas limited liability company

By: ____________________
Maxwell J. Aaronson,
Managing Member

THE STATE OF TEXAS §
§
COUNTY OF TRAVIS §

Before me, the undersigned authority, on this day personally appeared Maxwell J. Aaronson, Managing Member of Aaronson Tierra LLC, a Texas limited liability company [check one] ___ known to me or √ proved to me through Texas Driver License (description of identity card) to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that said persons executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 20th day of March 2024.

____
Notary Public, State of Texas
Printed name: Brian S. Munoz
Commission expires: 01-31-2027

BRIAN S. MUNOZ
My Notary ID # 134175514
Expires January 31, 2027

FURMAN TIERRA LLC,
a Texas limited liability company

By: ______________________
Maxwell J. Aaronson,
Vice President

THE STATE OF TEXAS §
§
COUNTY OF TRAVIS §

Before me, the undersigned authority, on this day personally appeared Maxwell J. Aaronson, Vice President of Furman Tierra LLC, a Texas limited liability company [check one] ___ known to me or ✓ proved to me through Texas Driver License (description of identity card) to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that said persons executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 20th day of March 2024.

____
Notary Public, State of Texas
Printed name: Brian S. Munoz
Commission expires:
01-31-2027

BRIAN S. MUNOZ
My Notary ID # 134175514
Expires January 31, 2027

After Recording, Return To:
Plazo Tierra LLC
P.O. Box 41805
Austin, Texas 78704

EXHIBIT A

LEGAL DESCRIPTION OF LAND

BEING 19.766 ACRES OR 861,004 SQUARE FEET OF LAND SITUATED IN THE FREDERICK FOY SURVEY, ABSTRACT NUMBER 229, WILLIAMSON COUNTY, TEXAS, AND BEING A PORTION OF A CALLED 1,013.527 ACRE TRACT CONVEYED TO SOMERSET HILLS, LTD BY DOCUMENT NUMBER 2004098880 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS (O.P.R.W.C.T.) WHICH TRACT IS THE SAME AS THAT CERTAIN 19.691 ACRE TRACT CONVEYED TO AARONSON TIERRA, LLC AND FURMAN TIERRA, LLC BY INSTRUMENT RECORDED AS DOCUMENT No. 2019110965, O.P.R.W.C.T.. SAID 19.766 ACRE TRACT OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS WITH ALL BEARINGS BEING REFERENCED TO THE TEXAS STATE PLANE COORDINATE SYSTEM, TEXAS CENTRAL ZONE, NAD 83/90 HARN DATUM WITH ALL DISTANCES SHOWN HEREON CONVERTED TO SURFACE VALUES BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 1.000143965.

BEGINNING, AT A 1/2-INCH IRON ROD WITH NO CAP FOUND, FOR THE NORTHEAST CORNER OF SAID 19.766 ACRE TRACT, BEING A POINT IN THE EAST LINE OF SAID 1,013.527 ACRE TRACT, SAME BEING AN INNER ELL CORNER OF A REMAINDER OF A CALLED 747.42 ACRE TRACT CONVEYED TO AHMAD FAKHR BY DOCUMENT NUMBER 9706311, POINT BEING NORTH 01 DEGREE 44 MINUTES 28 SECONDS WEST, A DISTANCE OF 247.78 FEET FROM A COMMON CORNER OF SAID 1,013.527 ACRE TRACT AND A REMAINDER OF A CALLED 963.84 ACRE TRACT CONVEYED TO JOHN F. YEARWOOD BY DOCUMENT NUMBER 9840749, OF THE OFFICIAL RECORDS OF WILLIAMSON COUNTY, TEXAS (O.R.W.C.T.);

THENCE, SOUTH 21 DEGREES 32 MINUTES 49 SECONDS EAST, ALONG THE LINE COMMON TO THE WEST LINE OF SAID 747.42 ACRE TRACT AND THE EAST LINE OF SAID 1,013.527 ACRE TRACT, A DISTANCE OF 965.65 FEET PAST A 1/2-INCH IRON ROD WITH CAP STAMPED "RPLS 5184" FOUND IN THE EAST LINE OF SAID 747.42 ACRE TRACT, A TOTAL DISTANCE OF 990.07 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND BEING A POINT IN THE NORTH RIGHT-OF-WAY OF RONALD REAGAN BOULEVARD (WIDTH VARIES) AS RECORDED IN DOCUMENT NUMBER 2010006962, O.P.R.W.C.T.;

THENCE, CONTINUING ALONG THE NORTH RIGHT-OF-WAY LINE OF SAID RONALD REAGAN BOULEVARD AND THE SOUTH LINE OF SAID 1,013.527 ACRE TRACT, THE FOLLOWING THREE (3) COURSES:

1. SOUTH 32 DEGREES 51 MINUTES 27 SECONDS WEST, 219.25 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND FOR A NON-TANGENT POINT OF CURVATURE;

2. 1721.79 FEET ALONG THE ARC OF SAID CURVE TO THE RIGHT, HAVING A RADIUS OF 2890.00 FEET, A CENTRAL ANGLE OF 34 DEGREES 08 MINUTES 07 SECONDS, A CHORD BEARING OF SOUTH 49 DEGREES 55 MINUTES 31 SECONDS WEST, A DISTANCE OF 1696.44 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND;

3. NORTH 23 DEGREES 00 MINUTES 25 SECONDS WEST, A DISTANCE OF 20.80 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND, SAID POINT BEING IN THE SOUTHEAST LINE OF A CALLED 97.068 ACRE TRACT CONVEYED TO JOHN F. YEARWOOD ET UX BY DOCUMENT NUMBER 9840749, O.R.W.C.T.;

THENCE, ALONG THE LINE COMMON TO THE NORTHWEST LINE OF SAID 1,013.527 ACRE TRACT AND SOUTHEAST LINE OF SAID 97.068 ACRE TRACT, THE FOLLOWING FOUR (4) COURSES:

1. NORTH 44 DEGREES 00 MINUTES 37 SECONDS EAST, A DISTANCE OF 313.71 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND;

2. NORTH 27 DEGREES 39 MINUTES 37 SECONDS EAST, A DISTANCE OF 1,395.88 FEET TO A 60D NAIL FOUND;

3. NORTH 19 DEGREES 15 MINUTES 37 SECONDS EAST, A DISTANCE OF 581.96 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND;

4. NORTH 01 DEGREES 42 MINUTES 00 SECONDS EAST, A DISTANCE OF 168.93 FEET TO THE POINT OF BEGINNING AND CONTAINING 19.766 ACRES OR 861,004 SQUARE FEET OF LAND, MORE OR LESS.

4 Plazo Tierra
PO Box 41805
Austin TX 78704

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS 2024021813

DEED Fee: $45.00
03/21/2024 09:25 AM MGOLDEN

THE STATE OF TEXAS WILLIAMSON COUNTY

Nancy E. Rister
Nancy E. Rister, County Clerk
Williamson County, Texas

NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM ANY INSTRUMENT THAT TRANSFERS AN INTEREST IN REAL PROPERTY BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

SPECIAL WARRANTY DEED

THE STATE OF TEXAS	§	
	§	KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF WILLIAMSON	§	

THAT PLAZO TIERRA LLC, a Texas limited liability company ("**Grantor**"), for and in consideration of the sum of Ten and No/100 Dollars ($10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, has GRANTED, CONVEYED, ASSIGNED AND DELIVERED and by these presents does GRANT, CONVEY, ASSIGN AND DELIVER, unto FURMAN TIERRA LLC, a Texas limited liability company ("**Grantee**"), whose address is 801 W. 5th Street #206, Austin, Texas 78703, the real property situated in Williamson County, Texas and described in **Exhibit A** attached hereto and made a part hereof for all purposes (the "**Land**"), together with any and all improvements located thereon, and together with all and singular the rights, benefits, privileges, easements, hereditaments and appurtenances thereof or in anywise appertaining to the Land or the improvements located thereon (the Land and all such improvements, rights, benefits, privileges, easements, hereditaments, appurtenances, and interests being hereinafter referred to as the "**Property**").

TO HAVE AND TO HOLD the Property unto Grantee, its successors and assigns forever, subject to the Permitted Encumbrances (defined below); and Grantor does hereby bind itself, its successors and assigns, to warrant and forever defend all and singular the Property, unto Grantee and its successors and assigns, against every person whomsoever, lawfully claiming or to claim the same or any part thereof by, through or under Grantor, but not otherwise, subject to the Permitted Encumbrances.

This conveyance is made by Grantor and accepted by Grantee subject to any and all easements, covenants, leases, rights-of-way, conditions, restrictions, outstanding mineral interests and royalty interests, if any, relating to the Property, to the extent, and only to the extent, that the same may still be in force and effect, and either shown of record in the Official Public Records of Williamson County, Texas, or that may be apparent on the Property (collectively, the "**Permitted Encumbrances**").

For the same consideration recited above, Grantor hereby GRANTS, CONVEYS, ASSIGNS AND DELIVERS unto Grantee without warranty, express or implied, all right, title and interest of Grantor, if any, in and to (i) strips or gores between the Property and abutting or immediately adjacent properties, and (ii) any land lying in or under the bed of any street, alley, road or right-of-way, opened or proposed, abutting or immediately adjacent to the Property.

Ad valorem taxes on the Property for the current and subsequent years are hereby assumed by Grantee.

[*The remainder of this page intentionally left blank; signature page immediately follows.*]

EXECUTED by Grantor on the date set forth in the acknowledgement below to be effective as of March 20th, 2024.

GRANTOR:

PLAZO TIERRA LLC,
a Texas limited liability company

By: ______________________
Maxwell J. Aaronson,
Managing Member

THE STATE OF TEXAS §
§
COUNTY OF TRAVIS §

Before me, the undersigned authority, on this day personally appeared Maxwell J. Aaronson, Managing Member of Plazo Tierra LLC, a Texas limited liability company [check one] ___ known to me or ✓ proved to me through Texas Driver License (description of identity card) to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that said persons executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 20th day of March 2024.

____
Notary Public, State of Texas
Printed name: Brian S. Munoz
Commission expires: 01-31-2027

BRIAN S. MUNOZ
My Notary ID # 134175514
Expires January 31, 2027

After Recording, Return To:
Furman Tierra LLC
801 W. 5th Street #206
Austin, Texas 78703

EXHIBIT A

LEGAL DESCRIPTION OF LAND

BEING 19.766 ACRES OR 861,004 SQUARE FEET OF LAND SITUATED IN THE FREDERICK FOY SURVEY, ABSTRACT NUMBER 229, WILLIAMSON COUNTY, TEXAS, AND BEING A PORTION OF A CALLED 1,013.527 ACRE TRACT CONVEYED TO SOMERSET HILLS, LTD BY DOCUMENT NUMBER 2004098880 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS (O.P.R.W.C.T.) WHICH TRACT IS THE SAME AS THAT CERTAIN 19.691 ACRE TRACT CONVEYED TO AARONSON TIERRA, LLC AND FURMAN TIERRA, LLC BY INSTRUMENT RECORDED AS DOCUMENT No. 2019110965, O.P.R.W.C.T.. SAID 19.766 ACRE TRACT OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS WITH ALL BEARINGS BEING REFERENCED TO THE TEXAS STATE PLANE COORDINATE SYSTEM, TEXAS CENTRAL ZONE, NAD 83/90 HARN DATUM WITH ALL DISTANCES SHOWN HEREON CONVERTED TO SURFACE VALUES BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 1.000143965.

BEGINNING, AT A 1/2-INCH IRON ROD WITH NO CAP FOUND, FOR THE NORTHEAST CORNER OF SAID 19.766 ACRE TRACT, BEING A POINT IN THE EAST LINE OF SAID 1,013.527 ACRE TRACT, SAME BEING AN INNER ELL CORNER OF A REMAINDER OF A CALLED 747.42 ACRE TRACT CONVEYED TO AHMAD FAKHR BY DOCUMENT NUMBER 9706311, POINT BEING NORTH 01 DEGREE 44 MINUTES 28 SECONDS WEST, A DISTANCE OF 247.78 FEET FROM A COMMON CORNER OF SAID 1,013.527 ACRE TRACT AND A REMAINDER OF A CALLED 963.84 ACRE TRACT CONVEYED TO JOHN F. YEARWOOD BY DOCUMENT NUMBER 9840749, OF THE OFFICIAL RECORDS OF WILLIAMSON COUNTY, TEXAS (O.R.W.C.T.);

THENCE, SOUTH 21 DEGREES 32 MINUTES 49 SECONDS EAST, ALONG THE LINE COMMON TO THE WEST LINE OF SAID 747.42 ACRE TRACT AND THE EAST LINE OF SAID 1,013.527 ACRE TRACT, A DISTANCE OF 965.65 FEET PAST A 1/2-INCH IRON ROD WITH CAP STAMPED "RPLS 5184" FOUND IN THE EAST LINE OF SAID 747.42 ACRE TRACT, A TOTAL DISTANCE OF 990.07 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND BEING A POINT IN THE NORTH RIGHT-OF-WAY OF RONALD REAGAN BOULEVARD (WIDTH VARIES) AS RECORDED IN DOCUMENT NUMBER 2010006962, O.P.R.W.C.T.;

THENCE, CONTINUING ALONG THE NORTH RIGHT-OF-WAY LINE OF SAID RONALD REAGAN BOULEVARD AND THE SOUTH LINE OF SAID 1,013.527 ACRE TRACT, THE FOLLOWING THREE (3) COURSES:

1. SOUTH 32 DEGREES 51 MINUTES 27 SECONDS WEST, 219.25 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND FOR A NON-TANGENT POINT OF CURVATURE;

2. 1721.79 FEET ALONG THE ARC OF SAID CURVE TO THE RIGHT, HAVING A RADIUS OF 2890.00 FEET, A CENTRAL ANGLE OF 34 DEGREES 08 MINUTES 07 SECONDS, A CHORD BEARING OF SOUTH 49 DEGREES 55 MINUTES 31 SECONDS WEST, A DISTANCE OF 1696.44 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND;

3. NORTH 23 DEGREES 00 MINUTES 25 SECONDS WEST, A DISTANCE OF 20.80 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND, SAID POINT BEING IN THE SOUTHEAST LINE OF A CALLED 97.068 ACRE TRACT CONVEYED TO JOHN F. YEARWOOD ET UX BY DOCUMENT NUMBER 9840749, O.R.W.C.T.;

THENCE, ALONG THE LINE COMMON TO THE NORTHWEST LINE OF SAID 1,013.527 ACRE TRACT AND SOUTHEAST LINE OF SAID 97.068 ACRE TRACT, THE FOLLOWING FOUR (4) COURSES:

1. NORTH 44 DEGREES 00 MINUTES 37 SECONDS EAST, A DISTANCE OF 313.71 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND;

2. NORTH 27 DEGREES 39 MINUTES 37 SECONDS EAST, A DISTANCE OF 1,395.88 FEET TO A 60D NAIL FOUND;

3. NORTH 19 DEGREES 15 MINUTES 37 SECONDS EAST, A DISTANCE OF 581.96 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND;

4. NORTH 01 DEGREES 42 MINUTES 00 SECONDS EAST, A DISTANCE OF 168.93 FEET TO THE POINT OF BEGINNING AND CONTAINING 19.766 ACRES OR 861,004 SQUARE FEET OF LAND, MORE OR LESS.

4 Plaza Tierra
PO Box 41805
Austin TX 78721

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS 2024021814

DEED Fee: $41.00
03/21/2024 09:25 AM MGOLDEN

THE STATE OF TEXAS WILLIAMSON COUNTY

Nancy E. Rister

Nancy E. Rister, County Clerk
Williamson County, Texas

NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM ANY INSTRUMENT THAT TRANSFERS AN INTEREST IN REAL PROPERTY BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

SPECIAL WARRANTY DEED

THE STATE OF TEXAS	§	
	§	KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF WILLIAMSON	§	

THAT AARONSON TIERRA LLC, a Texas limited liability company, and FURMAN TIERRA LLC, a Texas limited liability company (collectively, "**Grantor**"), for and in consideration of the sum of Ten and No/100 Dollars ($10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, has GRANTED, CONVEYED, ASSIGNED AND DELIVERED and by these presents does GRANT, CONVEY, ASSIGN AND DELIVER, unto PLAZO TIERRA LLC, a Texas limited liability company ("**Grantee**"), whose address is P.O. Box 41805, Austin, Texas 78704, the real property situated in Williamson County, Texas and described in **Exhibit A** attached hereto and made a part hereof for all purposes (the "**Land**"), together with any and all improvements located thereon, and together with all and singular the rights, benefits, privileges, easements, hereditaments and appurtenances thereof or in anywise appertaining to the Land or the improvements located thereon (the Land and all such improvements, rights, benefits, privileges, easements, hereditaments, appurtenances, and interests being hereinafter referred to as the "**Property**").

TO HAVE AND TO HOLD the Property unto Grantee, its successors and assigns forever, subject to the Permitted Encumbrances (defined below); and Grantor does hereby bind itself, its successors and assigns, to warrant and forever defend all and singular the Property, unto Grantee and its successors and assigns, against every person whomsoever, lawfully claiming or to claim the same or any part thereof by, through or under Grantor, but not otherwise, subject to the Permitted Encumbrances.

This conveyance is made by Grantor and accepted by Grantee subject to any and all easements, covenants, leases, rights-of-way, conditions, restrictions, outstanding mineral interests and royalty interests, if any, relating to the Property, to the extent, and only to the extent, that the same may still be in force and effect, and either shown of record in the Official Public Records of Williamson County, Texas, or that may be apparent on the Property (collectively, the "**Permitted Encumbrances**").

For the same consideration recited above, Grantor hereby GRANTS, CONVEYS, ASSIGNS AND DELIVERS unto Grantee without warranty, express or implied, all right, title and interest of Grantor, if any, in and to (i) strips or gores between the Property and abutting or immediately adjacent properties, and (ii) any land lying in or under the bed of any street, alley, road or right-of-way, opened or proposed, abutting or immediately adjacent to the Property.

Ad valorem taxes on the Property for the current and subsequent years are hereby assumed by Grantee.

[*The remainder of this page intentionally left blank; signature page immediately follows.*]

EXECUTED by Grantor on the dates set forth in the respective acknowledgements below to be effective as of March 20th, 2024.

GRANTOR:

AARONSON TIERRA LLC,
a Texas limited liability company

By: ______________________
Maxwell J. Aaronson,
Managing Member

THE STATE OF TEXAS §
§
COUNTY OF TRAVIS §

Before me, the undersigned authority, on this day personally appeared Maxwell J. Aaronson, Managing Member of Aaronson Tierra LLC, a Texas limited liability company [check one] ___ known to me or ✓ proved to me through Texas Driver License (description of identity card) to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that said persons executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 20th day of March 2024.

BRIAN S. MUNOZ
My Notary ID # 134176514
Expires January 31, 2027

____
Notary Public, State of Texas
Printed name: Brian S. Munoz
Commission expires: 01-31-2027

FURMAN TIERRA LLC,
a Texas limited liability company

By: [signature]
Maxwell J. Aaronson,
Vice President

THE STATE OF TEXAS §
§
COUNTY OF TRAVIS §

Before me, the undersigned authority, on this day personally appeared Maxwell J. Aaronson, Vice President of Furman Tierra LLC, a Texas limited liability company [check one] ___ known to me or ✓ proved to me through Texas Driver License (description of identity card) to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that said persons executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 20th day of March 2024.

[signature]
Notary Public, State of Texas
Printed name: Brian S. Munoz
Commission expires: 01-31-2027

BRIAN S. MUNOZ
My Notary ID # 134175514
Expires January 31, 2027

After Recording, Return To:
Plazo Tierra LLC
P.O. Box 41805
Austin, Texas 78704

EXHIBIT A

LEGAL DESCRIPTION OF LAND

BEING 113.393 ACRES OR 4,939,393 SQUARE FEET OF LAND SITUATED IN THE FREDRICK FOY SURVEY, ABSTRACT NUMBER 229 OF WILLIAMSON COUNTY, TEXAS AND BEING A PORTION OF A CALLED 1,013.527 ACRE TRACT CONVEYED TO SOMERSET HILLS, LTD. BY DOCUMENT NUMBER 2004098880 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY TEXAS (O.P.R.W.C.T.) AND ALL OF A CALLED 18.908 ACRE TRACT CONVEYED TO SOMERSET HILLS, LTD BY DOCUMENT NUMBER 2016050011 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS (O.P.R.W.C.T.) WHICH TRACT IS THE SAME AS THAT CERTAIN 113.393 ACRE TRACT OF LAND CONVEYED BY SOMERSET HILLS, LTD. TO AARONSON TIERRA, LLC AND FURMAN TIERRA, LLC BY DEED RECORDED IN DOCUMENT NUMBER 2019110964, O.P.R.W.C.T. SAID 113.393 ACRE TRACT OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS WITH ALL BEARINGS BEING REFERENCED TO THE TEXAS STATE PLANE COORDINATE SYSTEM, TEXAS CENTRAL ZONE, NAD 83/93 HARN DATUM WITH ALL DISTANCES SHOWN HEREON CONVERTED TO SURFACE VALUES BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 1.000143965.

BEGINNING, AT A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND, FOR THE NORTHWEST CORNER OF SAID 18.908 ACRE TRACT, BEING A POINT IN THE EAST LINE OF SAID 1,013.527 ACRE TRACT, SAME BEING THE SOUTHEAST CORNER OF A CALLED 7.2414 ACRE TRACT CONVEYED TO THE CITY OF GEORGETOWN BY DOCUMENT NUMBER 200906884, SAME ALSO BEING THE SOUTHWEST CORNER OF A CALLED 12.7586 ACRE TRACT ALSO CONVEYED TO THE CITY OF GEORGETOWN BY DOCUMENT NUMBER 200906884 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY TEXAS (O.P.R.W.C.T.);

THENCE, NORTH 68°26'34" EAST, ALONG THE LINE COMMON TO THE SOUTH LINE OF SAID 12.7586 ACRE TRACT AND THE NORTH LINE OF SAID 18.908 ACRE TRACT, A DISTANCE OF 671.19 FEET TO A 1/2- INCH IRON ROD WITH CAP STAMPED "FORESTER" FOUND IN THE EAST LINE OF SAID 18.908 ACRE TRACT, BEING A POINT IN THE WEST LINE OF THE REMAINDER OF A CALLED 266.511 ACRE TRACT CONVEYED TO JOHN F. YEARWOOD AS RECORDED IN VOLUME 2636, PAGE 907, W.C.D.R AND ALSO RECORDED IN DOCUMENT NUMBER 9455556 O.P.R.W.C.T.;

THENCE, SOUTH 81°05'53" EAST, ALONG THE LINE COMMON TO SAID 18.908 ACRE TRACT AND SAID REMAINDER OF A CALLED 266.511 ACRE TRACT, A DISTANCE OF 984.75 FEET TO, A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND, FOR THE NORTHWEST CORNER OF A CALLED 3.1616 ACRE TRACT CONVEYED TO JOHN F. YEARWOOD AS RECORDED IN DOCUMENT NUMBER 2008068635, O.P.R.W.C.T.;

THENCE, ALONG THE LINE COMMON TO THE EAST LINE OF SAID 18.908 ACRE TRACT AND THE WEST LINE OF SAID 3.1616 ACRE TRACT THE FOLLOWING THREE (3) COURSES:

1. SOUTH 21°22'34" EAST, A DISTANCE OF 256.79 FEET TO A FOUND SPIKE AT THE BEGINNING OF A CURVE TO THE RIGHT;

2. 98.39 FEET ALONG THE ARC OF SAID CURVE TO THE RIGHT, HAVING A RADIUS OF 470.00 FEET, A CENTRAL ANGLE OF 11°59'41", A CHORD BEARING OF SOUTH 15°22'43" EAST, AND A CHORD DISTANCE OF 98.21 FEET TO A FOUND SPIKE;

3. SOUTH 09°22'53" EAST, A DISTANCE OF 88.69 FEET TO A 1/2-INCH IRON ROD FOUND (NO CAP) IN THE NORTH RIGHT-OF-WAY LINE OF RONALD REAGAN BOULEVARD AS DEDICATED AS A CALLED 10.8151 ACRE TRACT BY DOCUMENT NUMBER 2010006962, O.P.R.W.C.T.;

THENCE, ALONG THE LINE COMMON TO THE SOUTH LINE OF SAID 18.908 ACRE TRACT AND THE NORTH RIGHT-OF-WAY LINE OF SAID REAGAN BOULEVARD THE FOLLOWING FOUR (4) COURSES:

1. SOUTH 81°04'43" WEST, A DISTANCE OF 46.76 FEET TO A POINT IN A 3-INCH FENCE CORNER POST;

2. SOUTH 08°27'17" EAST, A DISTANCE OF 20.00 FEET A 1/2-INCH IRON ROD FOUND (NO CAP) FOR A NON-TANGENT POINT OF CURVATURE;

3. 649.55 FEET ALONG THE ARC OF SAID CURVE TO THE RIGHT HAVING A RADIUS OF 2890.00 FEET, A CENTRAL ANGLE OF 12°52'40", A CHORD BEARING OF SOUTH 87°59'03" WEST, A DISTANCE OF 648.19 FEET TO A FOUND COTTON GIN SPINDLE;

4. NORTH 85°34'37" WEST, A DISTANCE OF 928.38 FEET TO A 1/2-INCH IRON ROD FOUND (NO CAP) FOR THE SOUTHWEST CORNER OF SAID 18.908 ACRE TRACT AND A POINT IN THE EAST LINE OF SAID 1,013.527 ACRE TRACT, THE EAST CORNER OF A CALLED 51.41 ACRE TRACT DEDICATION ALSO DESCRIBED IN DOCUMENT NUMBER 2010006962 O.P.R.W.C.T.; AND FROM WHICH THE NORTHWEST CORNER OF SAID 19.908 ACRE TRACT BEARS: NORTH 20°34'02" WEST, 326.12 FEET;

THENCE, CONTINUING ALONG THE NORTH RIGHT-OF-WAY LINE OF SAID REAGAN BOULEVARD AND THE NORTH LINE OF SAID 51.41 ACRE TRACT, THE FOLLOWING THREE (3) COURSES:

1. NORTH 85°34'37" WEST, A DISTANCE OF 456.14 FEET TO, A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND FOR A POINT OF CURVATURE TO THE LEFT;

2. 1929.68 FEET ALONG THE ARC OF SAID CURVE TO THE LEFT, HAVING A RADIUS OF 3670.00 FEET, A CENTRAL ANGLE OF 30°07'34", A CHORD BEARING OF SOUTH 79°21'36" WEST, A DISTANCE OF 1907.53 FEET TO A FOUND, 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY";

3. SOUTH 64°17'49" WEST, A DISTANCE OF 3169.13 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" FOUND FOR THE DIVISION LINE OF PROPOSED PARCELS FIVE (5) AND SIX (6); FROM WHICH A FOUND COTTON GIN SPINDLE BEARS SOUTH 64°17'49" WEST, 509.93 FEET,

THENCE, FROM SAID 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" AND DEPARTING THE NORTH RIGHT-OF-WAY LINE OF REAGAN BOULEVARD AND OVER AND ACROSS SAID 1,013.527 ACRE TRACT AND ALONG THE PROPOSED DIVISION LINE OF PARCELS FIVE AND SIX THE FOLLOWING FOUR (4) COURSES:

1. NORTH 22°18'59" WEST, A DISTANCE OF 422.01 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" FOUND;

2. NORTH 03°50'01" EAST, A DISTANCE OF 528.15 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" FOUND;

3. NORTH 21°30'51" WEST, A DISTANCE OF 346.09 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" FOUND;

4. NORTH 04°04'05" WEST, A DISTANCE OF 192.93 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" FOUND IN THE LINE COMMON TO THE NORTH LINE OF SAID 1,013.527 ACRE TRACT AND THE SOUTH LINE OF A CALLED 1.409 ACRE CITY OF GEORGETOWN TRACT, FROM WHICH A FOUND 1/2-INCH IRON ROD BEARS: SOUTH 68°25'09 WEST, A DISTANCE OF 385.91 FEET;

THENCE, NORTH 68°25'09" EAST, ALONG THE NORTH LINE OF SAID 1,013.527 ACRE TRACT, SOUTH LINE OF SAID 1.409 ACRE TRACT, A DISTANCE OF 309.70 FEET TO A 60(D) NAIL IN THE COMMON LINE OF SAID 1,013.527 ACRE TRACT AND A CALLED 963.84 ACRE TRACT CONVEYED TO JOHN F. YEARWOOD BY VOLUME 1813, PAGE 665 W.C.D.R AND ALSO RECORDED IN DOCUMENT NUMBER 9840749, O.P.R.W.C.T.;

THENCE, ALONG THE LINES COMMON TO A NORTH AND EAST LINE OF SAID 1,013.572 ACRE AND A WEST AND SOUTH LINE OF SAID 963.84 ACRE TRACT THE FOLLOWING TWO (2) COURSES:

1. SOUTH 22°21'51" EAST, A DISTANCE OF 532.46 FEET, TO A POINT IN 3-INCH FENCE CORNER POST;

2. NORTH 68°08'46" EAST; A DISTANCE OF 1453.60 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND FOR THE COMMON CORNER OF ABOVE SAID TRACTS AND THE NORTHWEST CORNER OF A CALLED 1.616 ACRE CITY OF GEORGETOWN TRACT, RECORDED IN DOCUMENT NUMBER 2003110378, O.P.R.W.C.T.;

THENCE, DEPARTING SAID 963.84 ACRE TRACT AND ALONG THE LINE COMMON TO SAID NORTHERLY LINES OF A 1,013.527 ACRE TRACT AND SAID WEST, SOUTH AND EAST LINE OF A 1.616 ACRE TRACT THE FOLLOWING FIVE (5) COURSES:

1. SOUTH 22°06'49" EAST, A DISTANCE OF 72.99 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND;

2. SOUTH 21°48'56" EAST, A DISTANCE OF 159.36 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND FOR A NON-TANGENT POINT OF CURVATURE TO THE RIGHT;

3. 273.82 FEET ALONG THE ARC OF SAID CURVE TO THE RIGHT, HAVING A RADIUS OF 5130.00 FEET, A CENTRAL ANGLE OF 03°03'30", A CHORD BEARING OF NORTH 82°44'31" EAST, A DISTANCE OF 273.79 FEET TO A FOUND, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON";

4. NORTH 21°48'56" WEST, A DISTANCE OF 228.87 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND;

5. NORTH 22°06'49" WEST, A DISTANCE OF 72.47 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND FOR A COMMON CORNER OF THESE TWO TRACTS WITH SAID 963.84 ACRE TRACT;

THENCE, ALONG THE LINE COMMON TO SAID NORTH LINE OF A 1,013.527 ACRE TRACT AND SAID SOUTH LINE OF A 963.84 ACRE TRACT THE FOLLOWING TWO (2) COURSES:

1. NORTH 68°08'46" EAST, A DISTANCE OF 485.41 FEET, TO A 3-INCH ANGLE FENCE POST;

2. NORTH 69°25'58" EAST, A DISTANCE OF 2272.23 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND FOR THE NORTHWEST CORNER OF SAID 7.2414 ACRE TRACT;

THENCE, SOUTH 24°33'00" EAST, ALONG THE LINE COMMON TO THE WEST LINE OF SAID 7.2414 ACRE TRACT WITH THE EAST LINE OF SAID REMAINDER OF A 1,013.527 ACRE TRACT, A DISTANCE OF 876.18 FEET TO A I /2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND FOR THE SOUTHWEST CORNER OF SAID 7.2414 ACRE TRACT;

THENCE, NORTH 68°26'36" EAST, ALONG THE SOUTH LINE OF SAID 7.2414 ACRE TRACT, A DISTANCE OF 331.59 FEET, TO THE POINT OF BEGINNING AND CONTAINING A COMPUTED AREA OF 113.393 ACRES OR (4,939,393 SQUARE FEET) OF LAND, MORE OR LESS.

(4) Plazo Tierra
PO Box 41805
Austin TX 78704

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS 2024021815

DEED Fee: $57.00
03/21/2024 09:25 AM MGOLDEN

THE STATE OF TEXAS WILLIAMSON COUNTY

Nancy E. Rister

Nancy E. Rister, County Clerk
Williamson County, Texas

NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM ANY INSTRUMENT THAT TRANSFERS AN INTEREST IN REAL PROPERTY BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

SPECIAL WARRANTY DEED

THE STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF WILLIAMSON §

THAT PLAZO TIERRA LLC, a Texas limited liability company ("**Grantor**"), for and in consideration of the sum of Ten and No/100 Dollars ($10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, has GRANTED, CONVEYED, ASSIGNED AND DELIVERED and by these presents does GRANT, CONVEY, ASSIGN AND DELIVER, unto FURMAN TIERRA LLC, a Texas limited liability company ("**Grantee**"), whose address is 801 W. 5th Street #206, Austin, Texas 78703, the real property situated in Williamson County, Texas and described in **Exhibit A** attached hereto and made a part hereof for all purposes (the "**Land**"), together with any and all improvements located thereon, and together with all and singular the rights, benefits, privileges, easements, hereditaments and appurtenances thereof or in anywise appertaining to the Land or the improvements located thereon (the Land and all such improvements, rights, benefits, privileges, easements, hereditaments, appurtenances, and interests being hereinafter referred to as the "**Property**").

TO HAVE AND TO HOLD the Property unto Grantee, its successors and assigns forever, subject to the Permitted Encumbrances (defined below); and Grantor does hereby bind itself, its successors and assigns, to warrant and forever defend all and singular the Property, unto Grantee and its successors and assigns, against every person whomsoever, lawfully claiming or to claim the same or any part thereof by, through or under Grantor, but not otherwise, subject to the Permitted Encumbrances.

This conveyance is made by Grantor and accepted by Grantee subject to any and all easements, covenants, leases, rights-of-way, conditions, restrictions, outstanding mineral interests and royalty interests, if any, relating to the Property, to the extent, and only to the extent, that the same may still be in force and effect, and either shown of record in the Official Public Records of Williamson County, Texas, or that may be apparent on the Property (collectively, the "**Permitted Encumbrances**").

For the same consideration recited above, Grantor hereby GRANTS, CONVEYS, ASSIGNS AND DELIVERS unto Grantee without warranty, express or implied, all right, title and interest of Grantor, if any, in and to (i) strips or gores between the Property and abutting or immediately adjacent properties, and (ii) any land lying in or under the bed of any street, alley, road or right-of-way, opened or proposed, abutting or immediately adjacent to the Property.

Ad valorem taxes on the Property for the current and subsequent years are hereby assumed by Grantee.

[*The remainder of this page intentionally left blank; signature page immediately follows.*]

EXECUTED by Grantor on the date set forth in the acknowledgement below to be effective as of March 20th, 2024.

GRANTOR:

PLAZO TIERRA LLC,
a Texas limited liability company

By:
Maxwell J. Aaronson,
Managing Member

THE STATE OF TEXAS §
§
COUNTY OF TRAVIS §

Before me, the undersigned authority, on this day personally appeared Maxwell J. Aaronson, Managing Member of Plazo Tierra LLC, a Texas limited liability company [check one] ___ known to me or ✓ proved to me through Texas Driver License (description of identity card) to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that said persons executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 20th day of March 2024.

Notary Public, State of Texas
Printed name: Brian S. Munoz
Commission expires: 01-31-2027

BRIAN S. MUNOZ
My Notary ID # 134175514
Expires January 31, 2027

After Recording, Return To:

Furman Tierra LLC
801 W. 5th Street #206
Austin, Texas 78703

EXHIBIT A

LEGAL DESCRIPTION OF LAND

BEING 113.393 ACRES OR 4,939,393 SQUARE FEET OF LAND SITUATED IN THE FREDRICK FOY SURVEY, ABSTRACT NUMBER 229 OF WILLIAMSON COUNTY, TEXAS AND BEING A PORTION OF A CALLED 1,013.527 ACRE TRACT CONVEYED TO SOMERSET HILLS, LTD. BY DOCUMENT NUMBER 2004098880 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY TEXAS (O.P.R.W.C.T.) AND ALL OF A CALLED 18.908 ACRE TRACT CONVEYED TO SOMERSET HILLS, LTD BY DOCUMENT NUMBER 2016050011 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS (O.P.R.W.C.T.) WHICH TRACT IS THE SAME AS THAT CERTAIN 113.393 ACRE TRACT OF LAND CONVEYED BY SOMERSET HILLS, LTD. TO AARONSON TIERRA, LLC AND FURMAN TIERRA, LLC BY DEED RECORDED IN DOCUMENT NUMBER 2019110964, O.P.R.W.C.T. SAID 113.393 ACRE TRACT OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS WITH ALL BEARINGS BEING REFERENCED TO THE TEXAS STATE PLANE COORDINATE SYSTEM, TEXAS CENTRAL ZONE, NAD 83/93 HARN DATUM WITH ALL DISTANCES SHOWN HEREON CONVERTED TO SURFACE VALUES BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 1.000143965.

BEGINNING, AT A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND, FOR THE NORTHWEST CORNER OF SAID 18.908 ACRE TRACT, BEING A POINT IN THE EAST LINE OF SAID 1,013.527 ACRE TRACT, SAME BEING THE SOUTHEAST CORNER OF A CALLED 7.2414 ACRE TRACT CONVEYED TO THE CITY OF GEORGETOWN BY DOCUMENT NUMBER 200906884, SAME ALSO BEING THE SOUTHWEST CORNER OF A CALLED 12.7586 ACRE TRACT ALSO CONVEYED TO THE CITY OF GEORGETOWN BY DOCUMENT NUMBER 200906884 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY TEXAS (O.P.R.W.C.T.);

THENCE, NORTH 68°26'34" EAST, ALONG THE LINE COMMON TO THE SOUTH LINE OF SAID 12.7586 ACRE TRACT AND THE NORTH LINE OF SAID 18.908 ACRE TRACT, A DISTANCE OF 671.19 FEET TO A 1/2- INCH IRON ROD WITH CAP STAMPED "FORESTER" FOUND IN THE EAST LINE OF SAID 18.908 ACRE TRACT, BEING A POINT IN THE WEST LINE OF THE REMAINDER OF A CALLED 266.511 ACRE TRACT CONVEYED TO JOHN F. YEARWOOD AS RECORDED IN VOLUME 2636, PAGE 907, W.C.D.R AND ALSO RECORDED IN DOCUMENT NUMBER 9455556 O.P.R.W.C.T.;

THENCE, SOUTH 81°05'53" EAST, ALONG THE LINE COMMON TO SAID 18.908 ACRE TRACT AND SAID REMAINDER OF A CALLED 266.511 ACRE TRACT, A DISTANCE OF 984.75 FEET TO, A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND, FOR THE NORTHWEST CORNER OF A CALLED 3.1616 ACRE TRACT CONVEYED TO JOHN F. YEARWOOD AS RECORDED IN DOCUMENT NUMBER 2008068635, O.P.R.W.C.T.;

THENCE, ALONG THE LINE COMMON TO THE EAST LINE OF SAID 18.908 ACRE TRACT AND THE WEST LINE OF SAID 3.1616 ACRE TRACT THE FOLLOWING THREE (3) COURSES:

1. SOUTH 21°22'34" EAST, A DISTANCE OF 256.79 FEET TO A FOUND SPIKE AT THE BEGINNING OF A CURVE TO THE RIGHT;

2. 98.39 FEET ALONG THE ARC OF SAID CURVE TO THE RIGHT, HAVING A RADIUS OF 470.00 FEET, A CENTRAL ANGLE OF 11°59'41", A CHORD BEARING OF SOUTH 15°22'43" EAST, AND A CHORD DISTANCE OF 98.21 FEET TO A FOUND SPIKE;

3. SOUTH 09°22'53" EAST, A DISTANCE OF 88.69 FEET TO A 1/2-INCH IRON ROD FOUND (NO CAP) IN THE NORTH RIGHT-OF-WAY LINE OF RONALD REAGAN BOULEVARD AS DEDICATED AS A CALLED 10.8151 ACRE TRACT BY DOCUMENT NUMBER 2010006962, O.P.R.W.C.T.;

THENCE, ALONG THE LINE COMMON TO THE SOUTH LINE OF SAID 18.908 ACRE TRACT AND THE NORTH RIGHT-OF-WAY LINE OF SAID REAGAN BOULEVARD THE FOLLOWING FOUR (4) COURSES:

1. SOUTH 81°04'43" WEST, A DISTANCE OF 46.76 FEET TO A POINT IN A 3-INCH FENCE CORNER POST;

2. SOUTH 08°27'17" EAST, A DISTANCE OF 20.00 FEET A 1/2-INCH IRON ROD FOUND (NO CAP) FOR A NON-TANGENT POINT OF CURVATURE;

3. 649.55 FEET ALONG THE ARC OF SAID CURVE TO THE RIGHT HAVING A RADIUS OF 2890.00 FEET, A CENTRAL ANGLE OF 12°52'40", A CHORD BEARING OF SOUTH 87°59'03" WEST, A DISTANCE OF 648.19 FEET TO A FOUND COTTON GIN SPINDLE;

4. NORTH 85°34'37" WEST, A DISTANCE OF 928.38 FEET TO A 1/2-INCH IRON ROD FOUND (NO CAP) FOR THE SOUTHWEST CORNER OF SAID 18.908 ACRE TRACT AND A POINT IN THE EAST LINE OF SAID 1,013.527 ACRE TRACT, THE EAST CORNER OF A CALLED 51.41 ACRE TRACT DEDICATION ALSO DESCRIBED IN DOCUMENT NUMBER 2010006962 O.P.R.W.C.T.; AND FROM WHICH THE NORTHWEST CORNER OF SAID 19.908 ACRE TRACT BEARS: NORTH 20°34'02" WEST, 326.12 FEET;

THENCE, CONTINUING ALONG THE NORTH RIGHT-OF-WAY LINE OF SAID REAGAN BOULEVARD AND THE NORTH LINE OF SAID 51.41 ACRE TRACT, THE FOLLOWING THREE (3) COURSES:

1. NORTH 85°34'37" WEST, A DISTANCE OF 456.14 FEET TO, A 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY" FOUND FOR A POINT OF CURVATURE TO THE LEFT;

2. 1929.68 FEET ALONG THE ARC OF SAID CURVE TO THE LEFT, HAVING A RADIUS OF 3670.00 FEET, A CENTRAL ANGLE OF 30°07'34", A CHORD BEARING OF SOUTH 79°21'36" WEST, A DISTANCE OF 1907.53 FEET TO A FOUND, 1/2-INCH IRON ROD WITH CAP STAMPED "STANLEY";

3. SOUTH 64°17'49" WEST, A DISTANCE OF 3169.13 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" FOUND FOR THE DIVISION LINE OF PROPOSED PARCELS FIVE (5) AND SIX (6); FROM WHICH A FOUND COTTON GIN SPINDLE BEARS SOUTH 64°17'49" WEST, 509.93 FEET,

THENCE, FROM SAID 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" AND DEPARTING THE NORTH RIGHT-OF-WAY LINE OF REAGAN BOULEVARD AND OVER AND ACROSS SAID 1,013.527 ACRE TRACT AND ALONG THE PROPOSED DIVISION LINE OF PARCELS FIVE AND SIX THE FOLLOWING FOUR (4) COURSES:

1. NORTH 22°18'59" WEST, A DISTANCE OF 422.01 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" FOUND;

2. NORTH 03°50'01" EAST, A DISTANCE OF 528.15 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" FOUND;

3. NORTH 21°30'51" WEST, A DISTANCE OF 346.09 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" FOUND;

4. NORTH 04°04'05" WEST, A DISTANCE OF 192.93 FEET TO A 1/2-INCH IRON ROD WITH CAP STAMPED "MCKIM & CREED" FOUND IN THE LINE COMMON TO THE NORTH LINE OF SAID 1,013.527 ACRE TRACT AND THE SOUTH LINE OF A CALLED 1.409 ACRE CITY OF GEORGETOWN TRACT, FROM WHICH A FOUND 1/2-INCH IRON ROD BEARS: SOUTH 68°25'09 WEST, A DISTANCE OF 385.91 FEET;

THENCE, NORTH 68°25'09" EAST, ALONG THE NORTH LINE OF SAID 1,013.527 ACRE TRACT, SOUTH LINE OF SAID 1.409 ACRE TRACT, A DISTANCE OF 309.70 FEET TO A 60(D) NAIL IN THE COMMON LINE OF SAID 1,013.527 ACRE TRACT AND A CALLED 963.84 ACRE TRACT CONVEYED TO JOHN F. YEARWOOD BY VOLUME 1813, PAGE 665 W.C.D.R AND ALSO RECORDED IN DOCUMENT NUMBER 9840749, O.P.R.W.C.T.;

THENCE, ALONG THE LINES COMMON TO A NORTH AND EAST LINE OF SAID 1,013.572 ACRE AND A WEST AND SOUTH LINE OF SAID 963.84 ACRE TRACT THE FOLLOWING TWO (2) COURSES:

1. SOUTH 22°21'51" EAST, A DISTANCE OF 532.46 FEET, TO A POINT IN 3-INCH FENCE CORNER POST;

2. NORTH 68°08'46" EAST; A DISTANCE OF 1453.60 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND FOR THE COMMON CORNER OF ABOVE SAID TRACTS AND THE NORTHWEST CORNER OF A CALLED 1.616 ACRE CITY OF

GEORGETOWN TRACT, RECORDED IN DOCUMENT NUMBER 2003110378, O.P.R.W.C.T.;

THENCE, DEPARTING SAID 963.84 ACRE TRACT AND ALONG THE LINE COMMON TO SAID NORTHERLY LINES OF A 1,013.527 ACRE TRACT AND SAID WEST, SOUTH AND EAST LINE OF A 1.616 ACRE TRACT THE FOLLOWING FIVE (5) COURSES:

1. SOUTH 22°06'49" EAST, A DISTANCE OF 72.99 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND;

2. SOUTH 21°48'56" EAST, A DISTANCE OF 159.36 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND FOR A NON-TANGENT POINT OF CURVATURE TO THE RIGHT;

3. 273.82 FEET ALONG THE ARC OF SAID CURVE TO THE RIGHT, HAVING A RADIUS OF 5130.00 FEET, A CENTRAL ANGLE OF 03°03'30", A CHORD BEARING OF NORTH 82°44'31" EAST, A DISTANCE OF 273.79 FEET TO A FOUND, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON";

4. NORTH 21°48'56" WEST, A DISTANCE OF 228.87 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND;

5. NORTH 22°06'49" WEST, A DISTANCE OF 72.47 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND FOR A COMMON CORNER OF THESE TWO TRACTS WITH SAID 963.84 ACRE TRACT;

THENCE, ALONG THE LINE COMMON TO SAID NORTH LINE OF A 1,013.527 ACRE TRACT AND SAID SOUTH LINE OF A 963.84 ACRE TRACT THE FOLLOWING TWO (2) COURSES:

1. NORTH 68°08'46" EAST, A DISTANCE OF 485.41 FEET, TO A 3-INCH ANGLE FENCE POST;

2. NORTH 69°25'58" EAST, A DISTANCE OF 2272.23 FEET, TO A 1/2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND FOR THE NORTHWEST CORNER OF SAID 7.2414 ACRE TRACT;

THENCE, SOUTH 24°33'00" EAST, ALONG THE LINE COMMON TO THE WEST LINE OF SAID 7.2414 ACRE TRACT WITH THE EAST LINE OF SAID REMAINDER OF A 1,013.527 ACRE TRACT, A DISTANCE OF 876.18 FEET TO A I /2-INCH IRON ROD WITH CAP STAMPED "SURVCON" FOUND FOR THE SOUTHWEST CORNER OF SAID 7.2414 ACRE TRACT;

THENCE, NORTH 68°26'36" EAST, ALONG THE SOUTH LINE OF SAID 7.2414 ACRE TRACT, A DISTANCE OF 331.59 FEET, TO THE POINT OF BEGINNING AND CONTAINING A COMPUTED AREA OF 113.393 ACRES OR (4,939,393 SQUARE FEET) OF LAND, MORE OR LESS.

(4) PlazoTierra
PO BOX 41805
Austin TX 78704

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS 2024021816
DEED Fee: $53.00
03/21/2024 09:25 AM MGOLDEN

THE STATE OF TEXAS WILLIAMSON COUNTY

Nancy E. Rister
Nancy E. Rister, County Clerk
Williamson County, Texas

Application Fee Form

Texas Commission on Environmental Quality
Name of Proposed Regulated Entity: Somerset Hills Phases A-E
Regulated Entity Location: Georgetown, TX
Name of Customer: Furman Tierra, LLC
Contact Person: Mr. Maxwell Aaronson Phone: (650) 666-9536
Customer Reference Number (if issued):CN 603410499
Regulated Entity Reference Number (if issued):RN 111309837

Austin Regional Office (3373)

- ☐ Hays
- ☐ Travis
- ☒ Williamson

San Antonio Regional Office (3362)

- ☐ Bexar
- ☐ Comal
- ☐ Medina
- ☐ Kinney
- ☐ Uvalde

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 ☐ San Antonio Regional Office

☐ Mailed to: TCEQ - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☐ 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	n/a Acres	$ 0
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	133.159 Acres	$ 8,000
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	n/a Acres	$ 0
Sewage Collection System	26,976 L.F.	$ 6,500
Lift Stations without sewer lines	n/a Acres	$ 0
Underground or Aboveground Storage Tank Facility	n/a Tanks	$ 0
Piping System(s)(only)	n/a Each	$ 0
Exception	n/a Each	$ 0

Type of Plan	*Size*	*Fee Due*
Extension of Time	n/a Each	$ 0

Signature: ______________________ Date: 5/6/2024

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

TCEQ Use Only

TCEQ Core Data Form

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 605798909		RN 111309837

SECTION II: Customer Information

5. Effective Date for Customer Information Updates (mm/dd/yyyy) 5/6/2024

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:*
Furman Tierra, LLC		

10. Mailing Address:	801 W. 5th St. Apt 206						
	City	Austin	State	TX	ZIP	78703	ZIP + 4

11. Country Mailing Information *(if outside USA)*	12. E-Mail Address *(if applicable)*
N/A	avfurman@aol.com

13. Telephone Number	14. Extension or Code	15. Fax Number *(if applicable)*
(512) 924-5526		( ) -

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)*
833844218	32069226333		803191345

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)*

Somerset Hills Phases A-E

24. Street Address of the Regulated Entity: *(No P.O. Boxes)*	32301 Ronald W Reagan Boulevard						
	City	Georgetown	**State**	TX	**ZIP**	78633	**ZIP + 4**
25. Mailing Address:							
	City		**State**		**ZIP**		**ZIP + 4**
26. E-Mail Address:							

27. Telephone Number	**28. Extension or Code**	**29. Fax Number** *(if applicable)*
( ) -	N/A	( ) -

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:	West of the Intersection of TX-195 and Ronald Reagan Boulevard

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

37. Latitude (N) In Decimal:	30.740845		**38. Longitude (W) In Decimal:**	97.753248	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	44	27.04	97	45	11.69

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

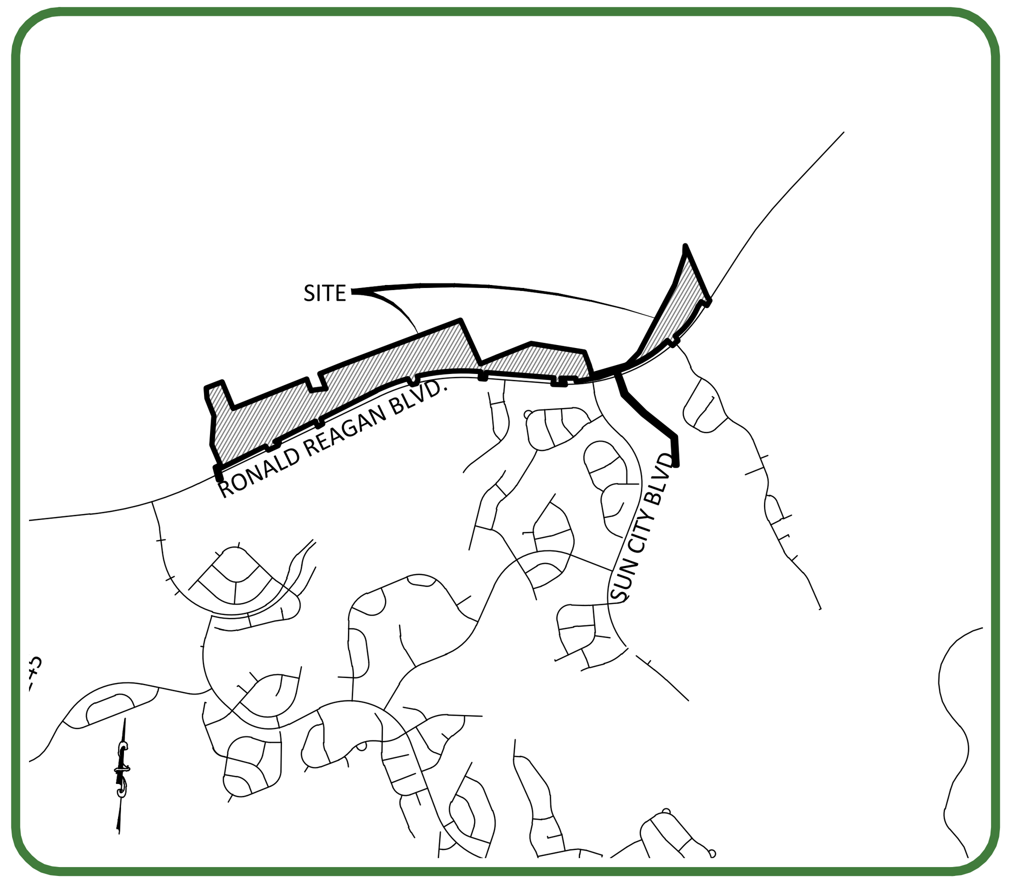
40. Name:	Steger Bizzell - Tyson L. Hasz, P.E.	**41. Title:**	Project Manager
42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(512) 930-9412	N/A	(N/A) -	Tyson.Hasz@stegerbizzell.com

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:**	Project Manager
Name*(In Print)* **:**	Mr. Tyson L. Hasz, P.E.	**Phone:**	(512) 930-9412
Signature:	Tyson Hasz	**Date:**	5/6/2024



Location Map
1" = 3000'

OWNER / DEVELOPER

Aaronson Tierra, LLC
MAXWELL AARONSON - GENERAL PARTNER
PO BOX 41805
AUSTIN, TEXAS 78704
650-666-9536
MAXJAARONSON@GOOGLEMAIL.COM

Furman Tierra, LLC
ALBERT V. FURMAN III - GENERAL PARTNER
801 W. 5TH ST. APT. 206
AUSTIN, TEXAS 20009
512-924-5526
AVFURMAN@AOL.COM

SURVEYOR

McKim & Creed
TBPLS FIRM NO. 101776-01
8868 RESEARCH BLVD., SUITE 407
AUSTIN, TEXAS 78628
512-916-0224
CONTACT: KENNETH CRIDER,R.P.L.S

ENGINEER/APPLICANT:

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

CONSTRUCTION PLANS FOR SOMERSET HILLS PHASES A-E

DRAINAGE, PAVING, WASTEWATER AND WATER SYSTEM IMPROVEMENTS
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS
2021-21-CON

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 June 4, 2020. Any springs and streams as identified in the Geologic Assessment are shown herein.
5. The project limits of construction is 142.89 acres.
6. Per UDC 13.06.A. For residential subdivisions, all electric distribution lines and individual service lines shall be installed underground. If overhead lines existed prior to underground installation, such poles, guy wires, and related structures shall be removed following construction of the underground infrastructure.
7. All electric and communication infrastructure must follow 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. At the time of impact fee payment by the owner of any of the 410 residential lots within Somerset Hills Phases A-E (2020-21-PP, 2021-21-CON, 2021-31-FP to 2021-35-FP) an impact fee discount for Water Transmission CIP of $3,297.00 per lot shall be made to the owner by the City of Georgetown up to a maximum of $1,351,770.00. The impact fee discount is provided in exchange for the installation of the following 2018 Water Master Plan infrastructure: remainder of the 24-inch line SC28-01 and portion of SC23-03 to the eastern side of the development as shown in these approved subdivision improvement construction plans and upsized from the original 12-inch line designed to serve the project.

Sheet List Table

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.

Submitted By:

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED PROFESSIONAL ENGINEER

Bryan E. Moore, P.E. 11/11/21 Date

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

APPROVED for the City of Georgetown:

SEE P&Z APPROVAL LETTER SHEET 4

David Munk P.E. Development Engineer Date
Approved by P&Z: DECEMBER 7, 2021

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/6/2024

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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.

BENCHMARKS: (REFER TO E&S CONTROL PLAN FOR LOCATION)

BM: AT 7 MAG NAIL SET IN ASPHALT (CR 245)
ELEV. 890.65
N= 10,240,307.62
E= 3,101,889.737

BM: TP 13 MAG NAIL SET IN ASPHALT (CR 245)
ELEV. 891.39
N= 10,240,657.52
E= 3,101,787.758

2020-21-PP
P&Z APPROVED
JANUARY 5, 2021

Project Number:
22226x Parcel 6&7

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.

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.

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 disk (300 dpi).
22. Per UDC 13.06.A. For residential subdivisions, all electric distribution lines and individual service lines shall be installed underground. If overhead lines existed prior to underground installation, such poles, guy wires, and related structures shall be removed following construction of the underground infrastructure.
23. All electric and communication infrastructure must follow UDC section 13.06

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 23, 2015 and supplemental ground survey by McKim and Creed, dated April 24, 2017. 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).
7. Add feature information upon receipt of Geologic Assessment.

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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

GENERAL NOTES (1 OF 3)

SOMERSET HILLS PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P\22000-22999 SOMERSET HILLS
Xref DWG FILE:	
Sheet Number:	2 of 218 sheets

2021-21-CON

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY ORGANIZED SEWAGE COLLECTION SYSTEM GENERAL CONSTRUCTION NOTES

1. This Organized Sewage Collection System must be designed and constructed in accordance with the Texas Commission on Environmental Quality's (TCEQ) Edwards Aquifer Rules 30 Texas Administrative Code (TAC) §§213.5(c) and 217.51 - 217.70 and 30 TAC Chapter 217, Subchapter D, and the City of Georgetown Standard Specifications.

2. All contractors conducting regulated activities associated with this proposed regulated project must be provided with copies of the Sewage Collection System 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. No later than 48 hours prior to commencing any regulated activity, the applicant or his agent must notify the Austin Regional Office, in writing, of the date on which the regulated activity will begin.

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. All temporary erosion and sedimentation controls must be installed prior to construction, must be maintained during construction, and must be removed when sufficient vegetation is established to control the erosion and sedimentation and the construction area is stabilized.

6. The sewer line trench details showing the cross section with the dimensions, pipe placement, and backfill instructions are included on Plan Sheets 194 & 195 of these plans. All sewer pipes joints must meet the requirements in 30 TAC §217.53(c) and 217.65.

7. Gravity lines must have a SDR-26 or less. Pressurized sewer systems must have pipe with a minimum working pressure rating of 150 psi.

   The ASTM, ANSI, or AWWA specification numbers for the pipe(s) and joints are: ASTM D 3034, F679, AWWAC900, CL150.

   The pipe material, the pressure classes, and the SDR and/or DR designations are: PVC SDR-26, PS-115, DR-18.

8. 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 Texas Commission on Environmental Quality 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 within two working days. 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.

9. 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 six (6) inches.

10. 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.

11. 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 194 & 195.

    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.

12. 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).

13. 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.

14. 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 194. (For potential future laterals).

    The private service lateral stub-outs must be installed as shown on the plan and profile sheets on Plan Sheets 152 - 157 and marked after backfilling as shown in the detail on Plan Sheet 195.

15. 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.

16. 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).

17. 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:

17.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:

17.a.1. Low Pressure Air Test.

17.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.

17.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.

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

17.a.1.B.b. 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

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.

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 (IN)	MINIMUM TIME (SEC)	MAXIMUM LENGTH FOR MINIMUM TIME (FT)	TIME FOR LONGER LENGTH (SEC/FT)
6	340	398	0.8550
8	454	298	1.5200
10	567	239	2.3740
12	680	199	3.4190
15	850	159	5.3420
18	1020	133	7.6930
21	1190	114	10.4710
24	1360	100	13.6760
27	1530	88	17.3090
30	1700	80	21.3690
33	1870	72	25.8560

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

17.a.1.D. 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.

17.a.1.E. 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.

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

17.a.2. Infiltration/Exfiltration Test.

17.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.

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

17.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.

17.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 subpargraph (C) of this paragraph.

17.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.

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

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

17.b.1.A. Mandrel Sizing.

17.b.1.A.a. 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.

17.b.1.A.b. 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.

17.b.1.A.c. All dimensions must meet the appropriate standard.

17.b.1.B. Mandrel Design.

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

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

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

17.b.1.B.d. Each size mandrel must use a separate proving ring.

17.b.1.C. Method Options.

17.b.1.C.a. An adjustable or flexible mandrel is prohibited.

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

17.b.1.C.c. 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.

17.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.

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

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

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

17.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.

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

19. 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.

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. 3

PIPE DIAMETER (IN)	LINEAR FEET (FT)	PIPE MATERIAL	NATIONAL STANDARD FOR PIPE MATERIAL	NATIONAL STANDARD FOR PIPE JOINTS
4	1541	PVC SDR-26	ASTM 3034	ASTM D 3212
6	5300	PVC SDR-26	ASTM 3034	ASTM D 3212
8	18747	PVC SDR-26	ASTM D 3034	ASTM D 3212
8	560	PVC DR-18	ASTM D 1784	ASTM D 3139
12	837	PVC SDR-26	ASTM D 3034	ASTM D 3212
18	233	DUCTILE IRON	ASTM A746	ANSI C11
24	207	DUCTILE IRON	ASTM A746	ANSI C11

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	1B
8	PVC DR-18	1B
12	PVC SDR-26	1B
12	PVC 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 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

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/7/2024

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

GENERAL NOTES (2 OF 3)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	3 of 218 sheets

2024-XX-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\3 GENERAL NOTES (2 OF 3).dwg By: Tyson Hasz Date: 3/14/2024 3:46 PM

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
LIFT STATION AND FORCE MAIN
GENERAL CONSTRUCTION NOTES

The following/listed "construction notes" are intended to be advisory in nature only and do not constitute an approval or conditional approval by the Executive Director (ED), nor do they constitute a comprehensive listing of rules or conditions to be followed during construction. Further actions may be required to achieve compliance with TCEQ regulations found in Title 30, Texas Administrative Code (TAC), Chapters 213 and 217, as well as local ordinances and regulations providing for the protection of water quality. Additionally, nothing contained in the following/listed "construction notes" restricts the powers of the ED, the commission or any other governmental entity to prevent, correct, or curtail activities that result or may result in pollution of the Edwards Aquifer or hydrologically connected surface waters. The holder of any Edwards Aquifer Protection Plan containing "construction notes" is still responsible for compliance with Title 30, TAC, Chapters 213 or any other applicable TCEQ regulation, as well as all conditions of an Edwards Aquifer Protection Plan through all phases of plan implementation. Failure to comply with any condition of the ED's approval, whether or not in contradiction of any "construction notes," is a violation of TCEQ regulations and any violation is subject to administrative rules, orders, and penalties as provided under Title 30, TAC § 213.10 (relating to Enforcement). Such violations may also be subject to civil penalties and injunction. The following/listed "construction notes" in no way represent an approved exception by the ED to any part of Title 30 TAC, Chapters 213 and 217, or any other TCEQ applicable regulation

1. This lift station and/or force main must be constructed in accordance with 30 Texas Administrative Code (TAC) §213.5(c), the Texas Commission on Environmental Quality (TCEQ) Edwards Aquifer Rules, and any local government standard specifications.

2. Any modification to the activities described in the referenced Lift Station/Force Main (LSFM) System application following the date of approval may require the submittal of a LSFM System application to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval.

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. Upon completion of any lift station excavation, a geologist must certify that the excavation has been inspected for the presence of sensitive features. The certification must be signed, sealed, and dated by the geologist preparing the certification. Certification that the excavation has been inspected must be submitted to the appropriate regional office.
   - If sensitive feature(s) are identified, all regulated activities near the sensitive feature must be suspended immediately and may not proceed until the executive director has reviewed and approved the methods proposed to protect any sensitive feature and the Edwards Aquifer from potentially adverse impacts to water quality from the lift station.
   - Construction may continue if the geologist certifies that no sensitive feature or features were present.

5. 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 discovery. A geologist's assessment of the location and extent of the feature discovered must be reported to that regional office in writing within two working days. 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.

6. All force main lines must be tested in accordance with 30 TAC §217.68. Testing method will be:
   - A pressure test must use 50 ponds per square inch above the normal operating pressure of a force main.
   - A temporary valve for pressure testing may be installed near the discharge point of a force main and removed after a test is successfully completed.
   - A pump isolation valve may be used as an opposite termination point.
   - A test must involve filling a force main with water.
   - A pipe must hold the designated test pressure for a minimum of 4.0 hours.
   - The leakage rate must not exceed 10.0 gallons per inch diameter per mile of pipe per day.

SIDEWALK NOTES

1. Sidewalks hatched with this hatch material are to be installed during construction. The sidewalks not hatched are to be built by the home builder.

LANDSCAPE QTO						
4-Oct-21						
SHADE TREES						
NAME	**Total QTY.**		**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**
PLOC	7		*Platanus Occidentalis*	American Sycamore	3"-3-1/2 cal., 15'-19' ht x 8'-12' spd., 36" box	Per Plan
ULCR	7		*Umus Crassifolia*	Cedar Elm	3" cal., 14-16' ht. x 6-8' spd., Cont Grown	Per Plan
ULPA	7		*Ulmus Parviflora*	Lacebark Elm	3" cal., 10' ht. x 5' spd., Cont. Grwn.	Per Plan
QUPO	8		*Quercus Shumardii*	Shumard Oak	3" cal. 12' ht x 4' spd., Cont. Grwn.	Per Plan
QUVI	8		*Quercus Virginiana*	Live Oak	3" cal. 8' ht. x 4' spd. Cont. Grwn.	Per Plan
TURF GRASS/ PLANT BEDS	**Total**					
Hydromulch	25318.32	s.f.				
	75.95	lbs.	Bermuda Seed with Native Turf from Native American Seed Co. - www.seedsource.com	3 lbs coated seed per 1,00 sqft lin		

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.

GEORGETOWN TEXAS

PLANNING AND ZONING COMMISSION
CERTIFICATE OF APPROVAL

DATE: December 7, 2021
CASE NUMBER: **2021-21-CON**
PROPERTY OWNER: Glenn Aaroson
LOCATION: 9299-9241 RR 2338
LEGAL DESCRIPTION: 62.10 acres of land out of the Chase H. Delaney Survey.
REQUEST: Approval based on the findings that the request meets the City of Georgetown ordinances, rules and regulations identified in the Exhibits.

The above referenced request was **APPROVED** by the Georgetown Planning and Zoning Commission ("Commission") on December 7, 2021, by a vote of 5 in favor and 0 in opposition with 0 abstaining.

COMMISSION:

R. Travis Perthuis,
Chair

ATTEST:

Steve Dickey,
Secretary

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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED PROFESSIONAL ENGINEER
06/21/2023

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

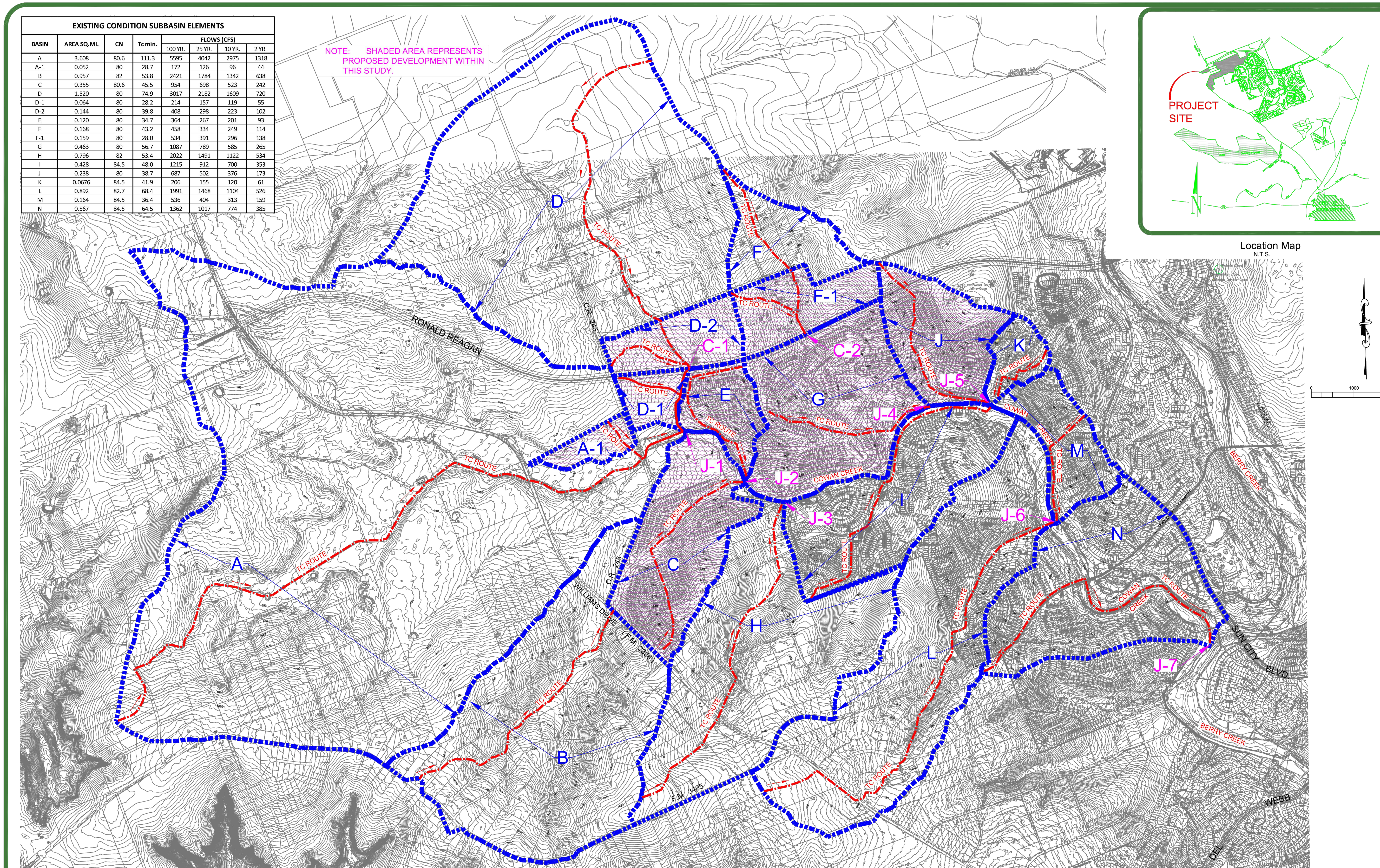
GENERAL NOTES (3 OF 3)

SOMERSET HILLS PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: P\22000-22999 SOMERSET HILLS
Xref DWG FILE.
Sheet Number: 4 of 218 sheets

EXISTING CONDITION SUBBASIN ELEMENTS							
BASIN	AREA SQ.MI.	CN	Tc min.	FLOWS (CFS)			
				100 YR.	25 YR.	10 YR.	2 YR.
A	3.608	80.6	111.3	5595	4042	2975	1318
A-1	0.052	80	28.7	172	126	96	44
B	0.957	82	53.8	2421	1784	1342	638
C	0.355	80.6	45.5	954	698	523	242
D	1.520	80	74.9	3017	2182	1609	720
D-1	0.064	80	28.2	214	157	119	55
D-2	0.144	80	39.8	408	298	223	102
E	0.120	80	34.7	364	267	201	93
F	0.168	80	43.2	458	334	249	114
F-1	0.159	80	28.0	534	391	296	138
G	0.463	80	56.7	1087	789	585	265
H	0.796	82	53.4	2022	1491	1122	534
I	0.428	84.5	48.0	1215	912	700	353
J	0.238	80	38.7	687	502	376	173
K	0.0676	84.5	41.9	206	155	120	61
L	0.892	82.7	68.4	1991	1468	1104	526
M	0.164	84.5	36.4	536	404	313	159
N	0.567	84.5	64.5	1362	1017	774	385

NOTE: SHADED AREA REPRESENTS PROPOSED DEVELOPMENT WITHIN THIS STUDY.



Location Map
N.T.S.

NOTES:

- THIS DRAINAGE STUDY IS CONSISTENT WITH THE REPORT "PARCELS 4, 5, AND, 6 COWAN CREEK" SUBMITTED ON OCTOBER 16, 2020

0 1000 2000 Feet

NO.	REVISION	BY	DATE

JMP, EJM DESIGNED BY: 16-Oct-20 DATE
JMP, EJM DRAWN BY: 16-Oct-20 DATE
CHECKED BY: DATE
APPROVED BY: DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
10/16/2020

STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

ATTACHMENT "A" - EXISTING CONDITION DRAINAGE MAP
for
COWAN CREEK
Georgetown, Texas

Project Number: 22226x
SCALE: 1" = 1000'
Project Path: 22226 xSomerset Hills
Project Name: Somerset Hills
Drawing Path: P:\22000-22999\22226 xSomerset Hills LTD\01_Parcel 3 \Calculations\Cowan Creek Drainage Study Update
Xref DWG FILE.
Sheet Number: 1

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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: 05-15-2021 DATE
SJT, AEC, BLM DRAWN BY: 05-15-2021 DATE
CHECKED BY: 05-15-2021 DATE
APPROVED BY: 05-15-2021 DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

EXISTING DRAINAGE PLAN COWAN CREEK
SOMERSET HILLS PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: P\22000-22999 SOMERSET HILLS
Xref DWG FILE.
Sheet Number: 10 of 218 sheets

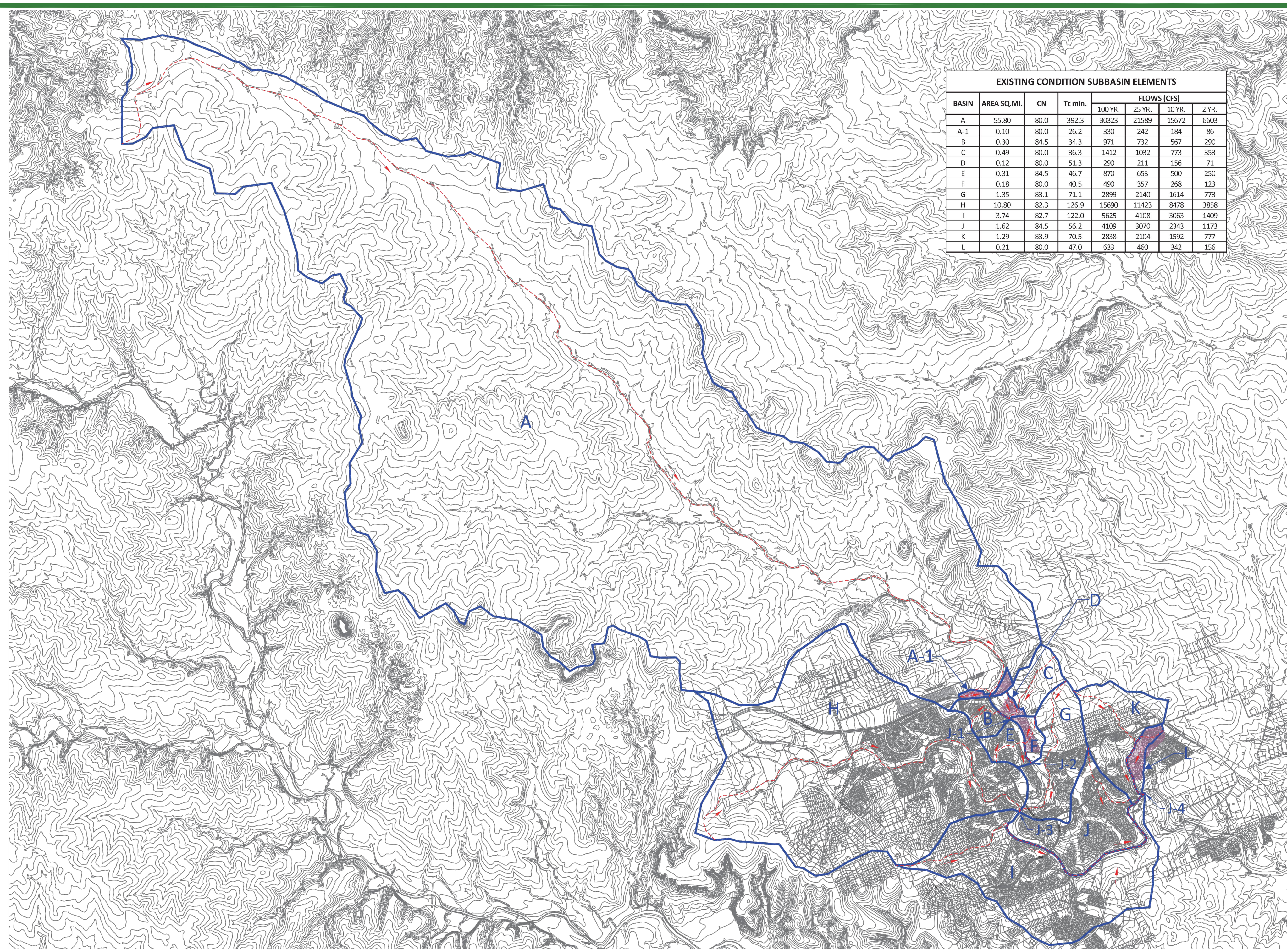
2021-21-CON

These drawings are the sole property of STEGER & BIZZELL ENGINEERING, INC. The use of these drawings is hereby restricted to the original site for which they were prepared. Reproduction or reuse of these drawings in whole or in part without written permission of STEGER & BIZZELL ENGINEERING, INC. is strictly prohibited.

File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\10 EXISTING DRAINAGE PLAN COWAN CREEK.dwg By: Brandon Montoya Date: 10/29/2021 1:04 PM

These drawings are the sole property of STEGER & BIZZELL ENGINEERING, INC. The use of these drawings is hereby restricted to the original site for which they were prepared. Reproduction or reuse of these drawings in whole or in part without written permission of STEGER & BIZZELL ENGINEERING, INC. is strictly prohibited.

0 4000 8000 Feet



EXISTING CONDITION SUBBASIN ELEMENTS							
BASIN	AREA SQ.MI.	CN	Tc min.	FLOWS (CFS)			
				100 YR.	25 YR.	10 YR.	2 YR.
A	55.80	80.0	392.3	30323	21589	15672	6603
A-1	0.10	80.0	26.2	330	242	184	86
B	0.30	84.5	34.3	971	732	567	290
C	0.49	80.0	36.3	1412	1032	773	353
D	0.12	80.0	51.3	290	211	156	71
E	0.31	84.5	46.7	870	653	500	250
F	0.18	80.0	40.5	490	357	268	123
G	1.35	83.1	71.1	2899	2140	1614	773
H	10.80	82.3	126.9	15690	11423	8478	3858
I	3.74	82.7	122.0	5625	4108	3063	1409
J	1.62	84.5	56.2	4109	3070	2343	1173
K	1.29	83.9	70.5	2838	2104	1592	777
L	0.21	80.0	47.0	633	460	342	156

NOTE:
- THIS DRAINAGE STUDY IS CONSISTENT WITH THE REPORT SUBMITTED OCTOBER 16, 2020 TITLED "PARCELS 6 & 7 BERRY CREEK"

Legend
- Tc Route
- Basin Boundary

NOTE:
SHADED AREA REPRESENTS DEVELOPMENT WITHIN THIS STUDY.

FOR REVIEW.

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF BRYAN E. MOORE, P.E. REG. #98920 ON 1/10/20. IT IS NOT TO BE USED FOR BIDDING, PERMIT OR CONSTRUCTION.

NO.	REVISION	BY	DATE

EJM — DESIGNED BY: — 1/2/2020 DATE
EJM — DRAWN BY: — 1/8/2020 DATE
CHECKED BY: — DATE
APPROVED BY: — DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
10/16/2020

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: 22226x

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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: — 05-15-2021 DATE
SJT, AEC, BLM — DRAWN BY: — 05-15-2021 DATE
CHECKED BY: — 05-15-2021 DATE
APPROVED BY: — 05-15-2021 DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

EXISTING DRAINAGE PLAN BERRY CREEK

SOMERSET HILLS PHASES A-E

City of Georgetown
Williamson County, Texas

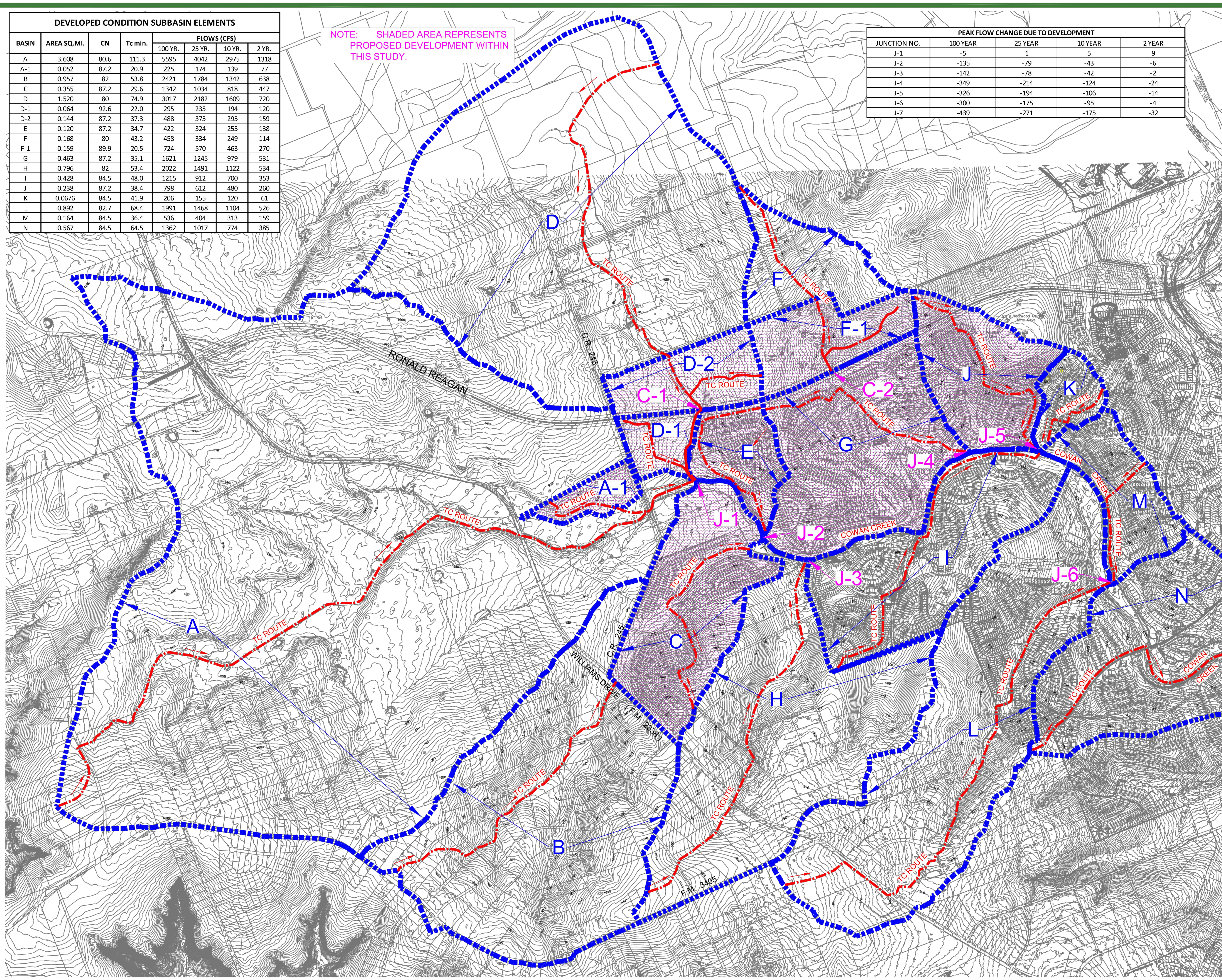
Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: P\22000-22999 SOMERSET HILLS
Xref DWG FILE.
Sheet Number: 11 of 218 sheets

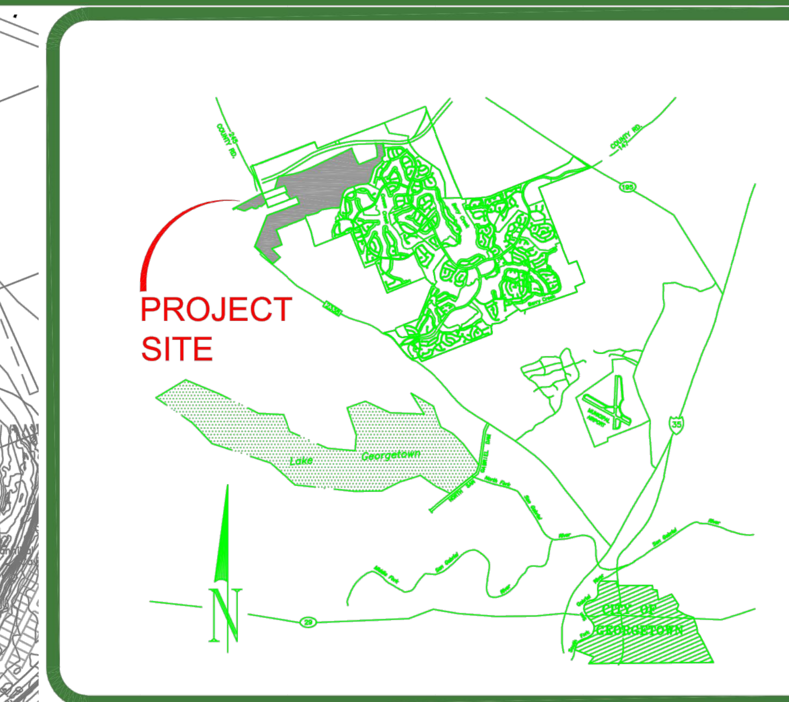
2021-21-CON

DEVELOPED CONDITION SUBBASIN ELEMENTS							
BASIN	AREA SQ.MI.	CN	Tc min.	FLOWS (CFS)			
				100 YR.	25 YR.	10 YR.	2 YR.
A	3.608	80.6	111.3	5595	4042	2975	1318
A-1	0.052	87.2	20.9	225	174	139	77
B	0.957	82	53.8	2421	1784	1342	638
C	0.355	87.2	29.6	1342	1034	818	447
D	1.520	80	74.9	3017	2182	1609	720
D-1	0.064	92.6	22.0	295	235	194	120
D-2	0.144	87.2	37.3	488	375	295	159
E	0.120	87.2	34.7	422	324	255	138
F	0.168	80	43.2	458	334	249	114
F-1	0.159	89.9	20.5	724	570	463	270
G	0.463	87.2	35.1	1621	1245	979	531
H	0.796	82	53.4	2022	1491	1122	534
I	0.428	84.5	48.0	1215	912	700	353
J	0.238	87.2	38.4	798	612	480	260
K	0.0676	84.5	41.9	206	155	120	61
L	0.892	82.7	68.4	1991	1468	1104	526
M	0.164	84.5	36.4	536	404	313	159
N	0.567	84.5	64.5	1362	1017	774	385

NOTE: SHADED AREA REPRESENTS PROPOSED DEVELOPMENT WITHIN THIS STUDY.

PEAK FLOW CHANGE DUE TO DEVELOPMENT				
JUNCTION NO.	100 YEAR	25 YEAR	10 YEAR	2 YEAR
J-1	-5	1	5	9
J-2	-135	-79	-43	-6
J-3	-142	-78	-42	-2
J-4	-349	-214	-124	-24
J-5	-326	-194	-106	-14
J-6	-300	-175	-95	-4
J-7	-439	-271	-175	-32





Location Map
N.T.S.

NOTES:

- THIS DRAINAGE STUDY IS CONSISTENT WITH THE REPORT "PARCELS 4, 5, AND, 6 COWAN CREEK" SUBMITTED ON OCTOBER 16, 2020

NO.	REVISION	BY	DATE

FOR REVIEW

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF BRYAN E. MOORE, P.E. REG. #98920 ON 10/16/20.

IT IS NOT TO BE USED FOR BIDDING, PERMIT OR CONSTRUCTION.

JMP, EJM 16-Oct-20
DESIGNED BY: DATE
JMP, EJM 16-Oct-20
DRAWN BY: DATE
CHECKED BY: DATE
APPROVED BY: DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED PROFESSIONAL ENGINEER
10/16/2020

STEGER BIZZELL

ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

ATTACHMENT "B" - DEVELOPED CONDITION DRAINAGE MAP
for
COWAN CREEK
Georgetown, Texas

Project Number: 22226x
SCALE: 1" = 1000'
Project Path: 22226 xSomerset Hills
Project Name: Somerset Hills
Drawing Path: P:\22000-22999\22226 xSomerset Hills LTD\01_Parcel 3 \Calculations\Cowan Creek Drainage Study Update
Xref DWG FILE.
Sheet Number: 1

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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 05-15-2021
DESIGNED BY: DATE
SJT, AEC, BLM 05-15-2021
DRAWN BY: DATE
05-15-2021
CHECKED BY: DATE
05-15-2021
APPROVED BY: DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED PROFESSIONAL ENGINEER
11/11/21

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

PROPOSED DRAINAGE PLAN COWAN CREEK

SOMERSET HILLS PHASES A-E

City of Georgetown
Williamson County, Texas

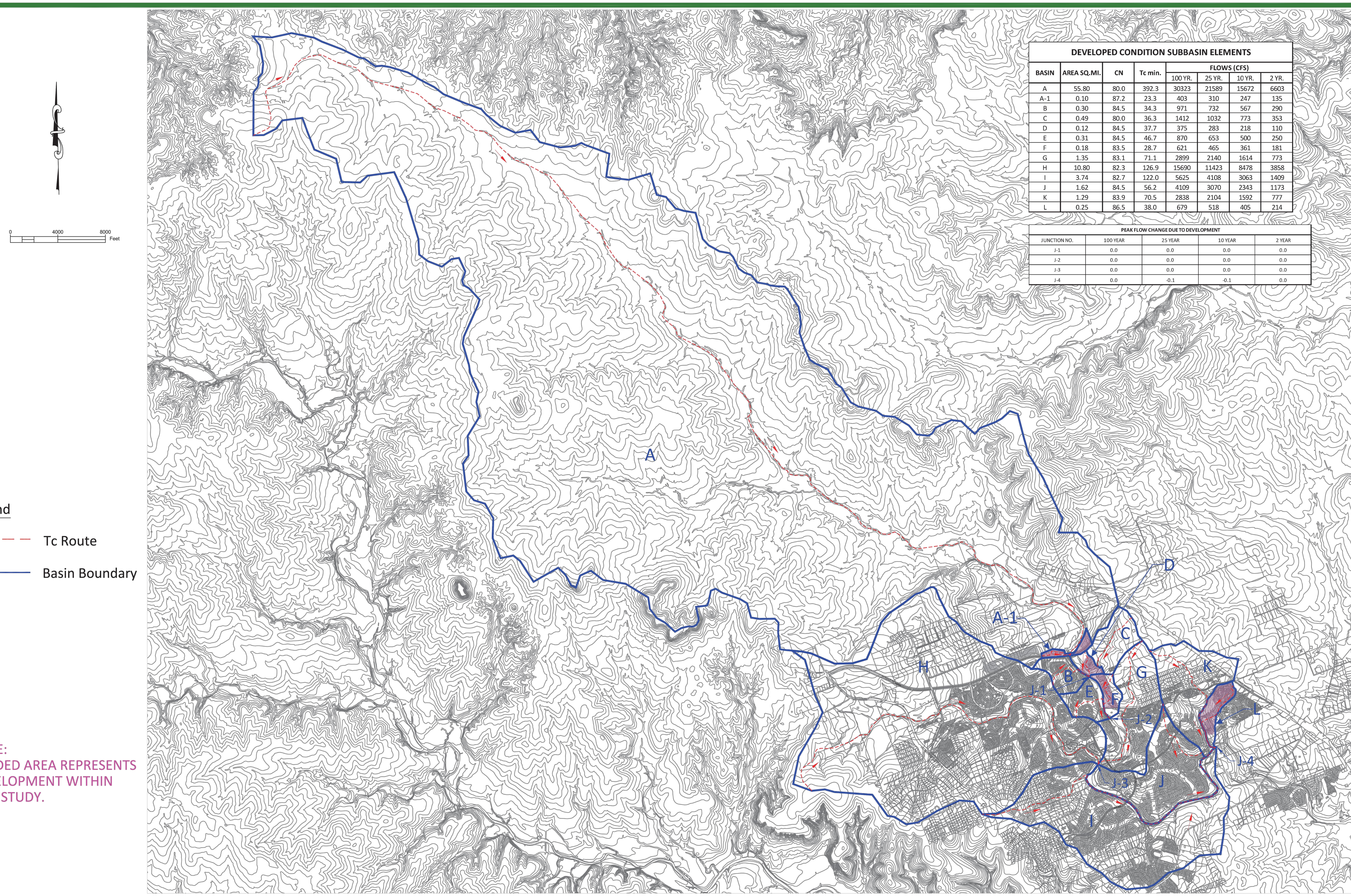
Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: P\22000-22999 SOMERSET HILLS
Xref DWG FILE.
Sheet Number: 12 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\12 PROPOSED DRAINAGE PLAN COWAN CREEK.dwg By: Brandon Montoya Date: 10/29/2021 1:05 PM

NOTE:

- THIS DRAINAGE STUDY IS CONSISTENT WITH THE REPORT SUBMITTED OCTOBER 16, 2020 TITLED "PARCELS 6 & 7 BERRY CREEK"



DEVELOPED CONDITION SUBBASIN ELEMENTS

BASIN	AREA SQ.MI.	CN	Tc min.	FLOWS (CFS)			
				100 YR.	25 YR.	10 YR.	2 YR.
A	55.80	80.0	392.3	30323	21589	15672	6603
A-1	0.10	87.2	23.3	403	310	247	135
B	0.30	84.5	34.3	971	732	567	290
C	0.49	80.0	36.3	1412	1032	773	353
D	0.12	84.5	37.7	375	283	218	110
E	0.31	84.5	46.7	870	653	500	250
F	0.18	83.5	28.7	621	465	361	181
G	1.35	83.1	71.1	2899	2140	1614	773
H	10.80	82.3	126.9	15690	11423	8478	3858
I	3.74	82.7	122.0	5625	4108	3063	1409
J	1.62	84.5	56.2	4109	3070	2343	1173
K	1.29	83.9	70.5	2838	2104	1592	777
L	0.25	86.5	38.0	679	518	405	214

PEAK FLOW CHANGE DUE TO DEVELOPMENT

JUNCTION NO.	100 YEAR	25 YEAR	10 YEAR	2 YEAR
J-1	0.0	0.0	0.0	0.0
J-2	0.0	0.0	0.0	0.0
J-3	0.0	0.0	0.0	0.0
J-4	0.0	-0.1	-0.1	0.0

Legend

Tc Route

Basin Boundary

NOTE:
SHADED AREA REPRESENTS DEVELOPMENT WITHIN THIS STUDY.

FOR REVIEW.

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF BRYAN E. MOORE, P.E. REG. #98920 ON 1/10/20. IT IS NOT TO BE USED FOR BIDDING, PERMIT OR CONSTRUCTION.

NO.	REVISION	BY	DATE

EJM 1/2/2020
DESIGNED BY: DATE
EJM 1/8/2020
DRAWN BY: DATE
CHECKED BY: DATE
APPROVED BY: DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
10/16/2020

STEGER BIZZELL

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

ATTACHMENT "B" - DEVELOPED CONDITION DRAINAGE MAP
for
BERRY CREEK
Georgetown
Williamson County, Texas

Project No: 22226x

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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 05-15-2021
DESIGNED BY: DATE
SJT, AEC, BLM 05-15-2021
DRAWN BY: DATE
05-15-2021
CHECKED BY: DATE
05-15-2021
APPROVED BY: DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

PROPOSED DRAINAGE PLAN BERRY CREEK

SOMERSET HILLS PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: P\22000-22999 SOMERSET HILLS
Xref DWG FILE.
Sheet Number: 13 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\13 PROPOSED DRAINAGE PLAN BERRY CREEK.dwg By: Brandon Montoya Date: 10/29/2021 1:07 PM

These drawings are the sole property of STEGER & BIZZELL ENGINEERING, INC. The use of these drawings is hereby restricted to the original site for which they were prepared. Reproduction or reuse of these drawings in whole or in part without written permission of STEGER & BIZZELL ENGINEERING, INC. is strictly prohibited.

LEGEND

- SINGLE FAMILY LOTS TO POND A
- RIGHT OF WAY TO POND A
- OFFSITE AREA TO POND A
- AMENITY CENTER TO POND A
- OPEN SPACES TO POND A
- SINGLE FAMILY LOTS TO VFS
- OPEN SPACES TO OFFSITE
- RIGHT OF WAY TO OFFSITE
- SINGLE FAMILY LOTS TO OFFSITE

POND A	AREA [SQFT]]	AREA [AC]	%	IMP [AC]
A01	75,930	1.74	58.6%	1.02
A02	170,063	3.90	60%	2.34
A03	118,328	2.72	60%	1.63
A04	98,205	2.25	50.9%	1.15
A05	91,359	2.10	60%	1.26
A06	158,482	3.64	60%	2.18
A07	40,422	0.93	60%	0.56
A08	18,004	0.41	60%	0.25
A09	38,648	0.89	60%	0.53
A10	5,576	0.13	60%	0.08
ROAD A1	289,778	6.65	80%	5.32
OVERTREATMENT	9,509	0.22	60%	0.13
ROAD A2 (ONSITE)	11,377	0.26	80%	0.21
ROAD A2 (OFFSITE OVERTREATMENT)	4,831	0.11	100%	0.11
ROAD A3 (ONSITE)	32,299	0.74	80%	0.59
ROAD A3 (OFFSITE OVERTREATMENT)	6,529	0.15	100%	0.15
AMENITY	59,762	1.37	70%	0.96
OFF-1	649,722	14.92	0%	0.00
POND A	50,034	1.15	0%	0.00
CITY OF GEORGETOWN LOT-1	27,669	0.64	0%	0.00
OPEN SPACE-1	7,338	0.17	12%	0.02
OPEN SPACE-2	9,242	0.21	0%	0.00
ONSITE	1,274,846	29.27		18.10
OFFSITE TO POND	677,391	15.55		0.00
OVERTREATMENT	20,868	0.48		0.39
TOTAL	1,973,106	45.30		18.49

Pond A Volume			
Stage (ft)	Area (sf)	Avg End Area Volume (cf)	Avg End Area Cumulative Volume (cf)
887.08	0	0	0
888	12,517	5,758	5,758
889	27,136	19,826	25,584
890	31,360	29,248	54,832
891	34,107	32,734	87,566
892	36,938	35,523	123,088
893	39,854	38,396	161,484
894	42,854	41,354	202,838
895	45,938	44,396	247,234
	WQ Volume Required:		124,717

100 YEAR DEV CFS
267.82
Maximum WSE (ft)
892
Weir Elevation (ft)
892
Weir Length (ft)
95

WEIR CALCULATIONS WQ POND A		
Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
889	0	0
890	0.4	0
891	0.95	0
892	1.16	0
893	1.2	95
894	1.57	269
895	1.57	494
100 YEAR CFS TO POND A		267.82

0 100 200 Feet

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project
County = **Williamson**
Total project area included in plan * = **133.16** acres
Predevelopment impervious area within the limits of the plan * = **0.00** acres
Total post-development impervious area within the limits of the plan* = **48.34** acres
Total post-development impervious cover fraction * = **0.36**
P = **32** inches

$L_{M\ TOTAL\ PROJECT}$ = **42074** lbs. **44751 AT 85% REMOVAL**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = POND A

Total drainage basin/outfall area = **42.18** acres
Predevelopment impervious area within drainage basin/outfall area = **0.00** acres
Post-development impervious area within drainage basin/outfall area = **18.49** acres
st-development impervious fraction within drainage basin/outfall area = **0.44**
$L_{M\ THIS\ BASIN}$ = **16095** lbs. **17118 AT 85% REMOVAL**

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Batch Detention**
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 = **29.27** acres
A_I = **18.10** acres
A_P = **11.17** acres
L_R = **18412** lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = **17118** lbs.

F = **0.93**

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 = **2.20** inches
Post Development Runoff Coefficient = **0.43**
On-site Water Quality Volume = **101447** cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP = **15.55** 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 = **2484** cubic feet

Storage for Sediment = **20786**
Total Capture Volume (required water quality volume(s) x 1.20) = 124717 cubic feet

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Vegetated Filter Strips**
Removal efficiency = **85** 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 = **5.33** acres
A_I = **3.20** acres
A_P = **2.13** acres
L_R = **3041** lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = **2961** lbs.

F = **0.97**

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/7/2024

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

PHASE A WATER QUALITY PLAN
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.

2024-XX-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\14 PHASE A WATER QUALITY PLAN.dwg By: Kevin Langford Date: 5/6/2024 12:35 PM

3

LEGEND

- SINGLE FAMILY LOTS TO POND B
- RIGHT OF WAY AREA TO POND B
- SINGLE FAMILY LOTS TO VFS
- LIFT STATION AREA TO POND B
- OPEN SPACES TO POND B
- OPEN SPACES TO OFFSITE
- RIGHT OF AWAY AREA TO OFFSITE
- OFFSITE AREAS TO POND B
- OPEN SPACES TO POND C

POND B	AREA [SQFT]	AREA [AC]	%	IMP
B01	97,347	2.23	60%	1.34
B02	97,723	2.24	60%	1.35
B03	17,440	0.40	60%	0.24
B04	190,735	4.38	60%	2.63
B05	156,032	3.58	60%	2.15
B06	212,185	4.87	60%	2.92
B07	64,743	1.49	60%	0.89
B08	111,625	2.56	60%	1.54
ROAD B1	318,299	7.31	80%	5.96
ROAD B2 ONSITE OVERTREATMENT	25,850	0.59	80%	0.47
ROADS B1&2 (OFFSITE OVERTREATMENT)	12,491	0.29	80%	0.23
LIFT STATION	1,424	0.03	100%	0.03
POND-B	130,058	2.99	0%	0.00
OPEN SPACE-1	165,793	3.81	0%	0.00
OPEN SPACE-2	96,061	2.21	0%	0.00
OPEN SPACE-3	542	0.01	0%	0.00
OPEN SPACE-4	8,731	0.20	0%	0.00
OPEN SPACE-5	16,154	0.37	0%	0.00
CITY OF GEORGETOWN LOT-2	36,252	0.83	0%	0.00
OFF-1	185,107	4.25	0%	0.00
OFF-2	98,778	2.27	0%	0.00
ONSITE	1,710,742	39.27		19.52
OFFSITE TO POND	320,137	7.35		0.00
OFFSITE OVERTREATMENT	12,491	0.29		0.23
TOTAL	2,043,370	46.91		19.75

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project
County = Williamson
Total project area included in plan * = 133.16 acres
Predevelopment impervious area within the limits of the plan * = 0.00 acres
Total post-development impervious area within the limits of the plan* = 48.34 acres
Total post-development impervious cover fraction * = 0.36
P = 32 inches

$L_{M\ TOTAL\ PROJECT}$ = 42074 lbs. 44751 AT 85% REMOVAL

0 200 400 Feet

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = POND B

Total drainage basin/outfall area = 50.64 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 19.64 acres
Post-development impervious fraction within drainage basin/outfall area = 0.39
$L_{M\ THIS\ BASIN}$ = 17093 lbs. 18180 AT 85% REMOVAL

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
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 = 38.68 acres
A_I = 18.93 acres
A_P = 19.75 acres
L_R = 19387 lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 18180 lbs.

F = 0.94

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 = 2.40 inches
Post Development Runoff Coefficient = 0.35
On-site Water Quality Volume = 118546 cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP = 7.35 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 = 1281 cubic feet

Storage for Sediment = 23965
Total Capture Volume (required water quality volume(s) x 1.20) = 143792 cubic feet

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = VFS - PH B

Total drainage basin/outfall area = 3.29 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 1.97 acres
Post-development impervious fraction within drainage basin/outfall area = 0.60
$L_{M\ THIS\ BASIN}$ = 1718 lbs. 1827 AT 85% REMOVAL

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 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)

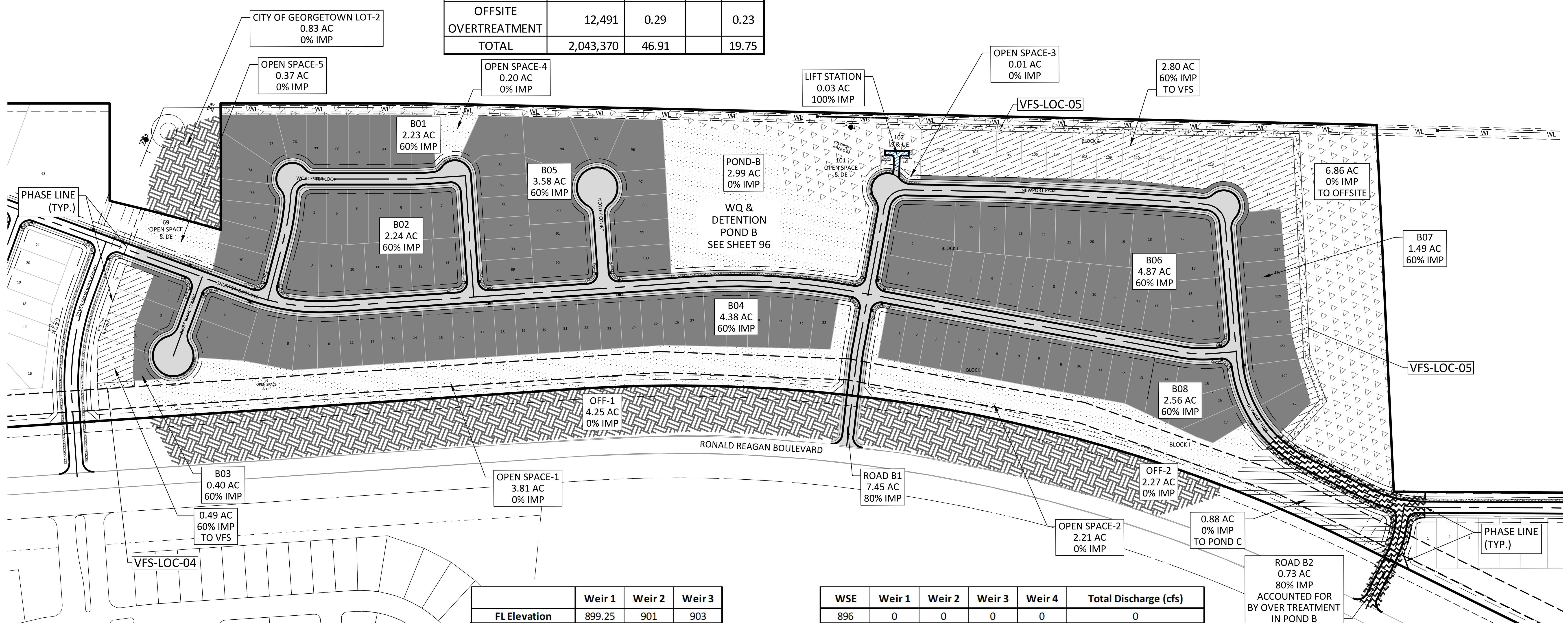
where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C = 3.29 acres
A_I = 1.97 acres
A_P = 1.32 acres
L_R = 1877 lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 1827 lbs.

F = 0.97



	Weir 1	Weir 2	Weir 3
FL Elevation	899.25	901	903
Weir Length (ft)	3	6	8

100 Year CFS	326.4

WSE	Weir 1	Weir 2	Weir 3	Weir 4	Total Discharge (cfs)
896	0	0	0	0	0
897	0	0	0	0	0
898	0	0	0	0	0
898.75	0	0	0	0	0
899	0	0	0	0	0.00
900	5.845671	0	0	0	5.85
901	20.83529	0	0	0	20.84
902	41.04323	18	0	0	59.04
903	65.35659	50.91169	0	0	116.27
904	93.17146	93.53074	24	0	210.70
905	124.0921	144	67.88225	0	335.97
906	157.8331	201.2461	124.7077	0	483.79

ELEV: 899.25
WQ VOLUME MET
BEGIN DETENTION

POND B VOLUME			
Stage (ft)	Area (sf)	Avg End Area Volume (cf)	Avg End Area Cumulative Volume (cf)
895.36	0	0	0
896	6,837	2,188	2,188
897	36,205	21,521	23,709
898	67,995	52,100	75,809
898.5	74,477	35,618	111,427
899	76383.8	37,715	149,142
900	80284.7	78,334	227,476
901	84321.9	82,303	309,780
902	88504	86,413	396,193
903	92802.8	90,653	486,846
904	99863	96,333	583,179
905	104116	101,990	685,169
906	108436	106,276	791,445
		Required:	143,792

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG 03-15-2024
DESIGNED BY: DATE
TEH, TG, CL, EJH 03-15-2024
DRAWN BY: DATE
TLH 03-15-2024
CHECKED BY: DATE
TLH 03-15-2024
APPROVED BY: DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

PHASE B WATER QUALITY PLAN
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P:\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:
Sheet Number: 15 of 218 sheets

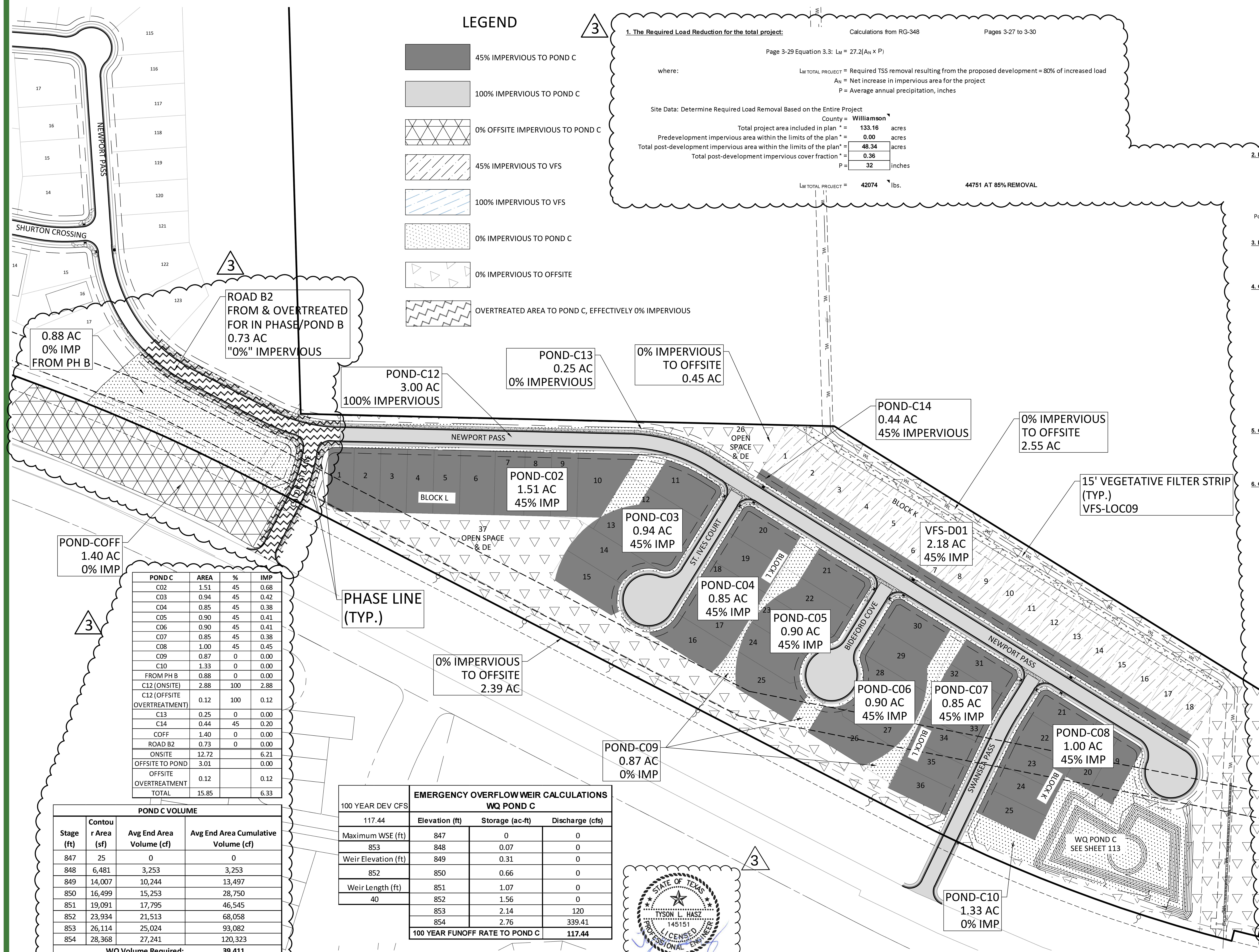
2024-XX-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\15 PHASE B WATER QUALITY PLAN.dwg By: Kevin Langford Date: 5/6/2024 12:37 PM

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.

LEGEND

- 45% IMPERVIOUS TO POND C
- 100% IMPERVIOUS TO POND C
- 0% OFFSITE IMPERVIOUS TO POND C
- 45% IMPERVIOUS TO VFS
- 100% IMPERVIOUS TO VFS
- 0% IMPERVIOUS TO POND C
- 0% IMPERVIOUS TO OFFSITE
- OVERTREATED AREA TO POND C, EFFECTIVELY 0% IMPERVIOUS



1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County = **Williamson**
Total project area included in plan * = **133.16** acres
Predevelopment impervious area within the limits of the plan * = **0.00** acres
Total post-development impervious area within the limits of the plan* = **48.34** acres
Total post-development impervious cover fraction * = **0.36**
P = **32** inches

$L_{M\ TOTAL\ PROJECT}$ = **42074** lbs. **44751 AT 85% REMOVAL**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = POND C

Total drainage basin/outfall area = **20.58** acres
Predevelopment impervious area within drainage basin/outfall area = **0.00** acres
Post-development impervious area within drainage basin/outfall area = **6.33** acres
Post-development impervious fraction within drainage basin/outfall area = **0.31**
$L_{M\ THIS\ BASIN}$ = **5506** lbs. **5856 AT 85% REMOVAL**

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Batch Detention**
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 = **12.72** acres
A_I = **6.21** acres
A_P = **6.51** acres
L_R = **6355** lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = **5856** lbs.

F = **0.92**

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 = **2.00** inches
Post Development Runoff Coefficient = **0.35**
On-site Water Quality Volume = **32405** cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP = **3.01** 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 = **437** cubic feet

Storage for Sediment = **6568**
Total Capture Volume (required water quality volume(s) x 1.20) = 39411 cubic feet

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = VFS - PH D

Total drainage basin/outfall area = **2.18** acres
Predevelopment impervious area within drainage basin/outfall area = **0.00** acres
Post-development impervious area within drainage basin/outfall area = **0.98** acres
Post-development impervious fraction within drainage basin/outfall area = **0.45**
$L_{M\ THIS\ BASIN}$ = **854** lbs. **908 AT 85% REMOVAL**

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Vegetated Filter Strips**
Removal efficiency = **85** 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 = **2.18** acres
A_I = **0.98** acres
A_P = **1.20** acres
L_R = **941** lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = **908** lbs.

F = **0.97**

POND C	AREA	%	IMP
C02	1.51	45	0.68
C03	0.94	45	0.42
C04	0.85	45	0.38
C05	0.90	45	0.41
C06	0.90	45	0.41
C07	0.85	45	0.38
C08	1.00	45	0.45
C09	0.87	0	0.00
C10	1.33	0	0.00
FROM PH B	0.88	0	0.00
C12 (ONSITE)	2.88	100	2.88
C12 (OFFSITE OVERTREATMENT)	0.12	100	0.12
C13	0.25	0	0.00
C14	0.44	45	0.20
COFF	1.40	0	0.00
ROAD B2	0.73	0	0.00
ONSITE	12.72		6.21
OFFSITE TO POND	3.01		0.00
OFFSITE OVERTREATMENT	0.12		0.12
TOTAL	15.85		6.33

POND C VOLUME

Stage (ft)	Contour Area (sf)	Avg End Area Volume (cf)	Avg End Area Cumulative Volume (cf)
847	25	0	0
848	6,481	3,253	3,253
849	14,007	10,244	13,497
850	16,499	15,253	28,750
851	19,091	17,795	46,545
852	23,934	21,513	68,058
853	26,114	25,024	93,082
854	28,368	27,241	120,323
WQ Volume Required:			39,411

100 YEAR DEV CFS
117.44
Maximum WSE (ft)
853
Weir Elevation (ft)
852
Weir Length (ft)
40

EMERGENCY OVERFLOW WEIR CALCULATIONS WQ POND C

Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
847	0	0
848	0.07	0
849	0.31	0
850	0.66	0
851	1.07	0
852	1.56	0
853	2.14	120
854	2.76	339.41
100 YEAR FUNOFF RATE TO POND C		117.44

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/7/2024

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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED PROFESSIONAL ENGINEER
11/11/21

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

PHASE D WATER QUALITY PLAN

SOMERSET HILLS - PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.	
Sheet Number:	16 of 218 sheets

2021-21-CON

LEGEND

- 45% IMPERVIOUS TO POND C
- 100% IMPERVIOUS TO POND C
- 45% IMPERVIOUS TO VFS
- 100% IMPERVIOUS TO VFS
- 0% IMPERVIOUS TO POND C
- 0% IMPERVIOUS TO OFFSITE
- 100% IMPERVIOUS TO OFFSITE

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

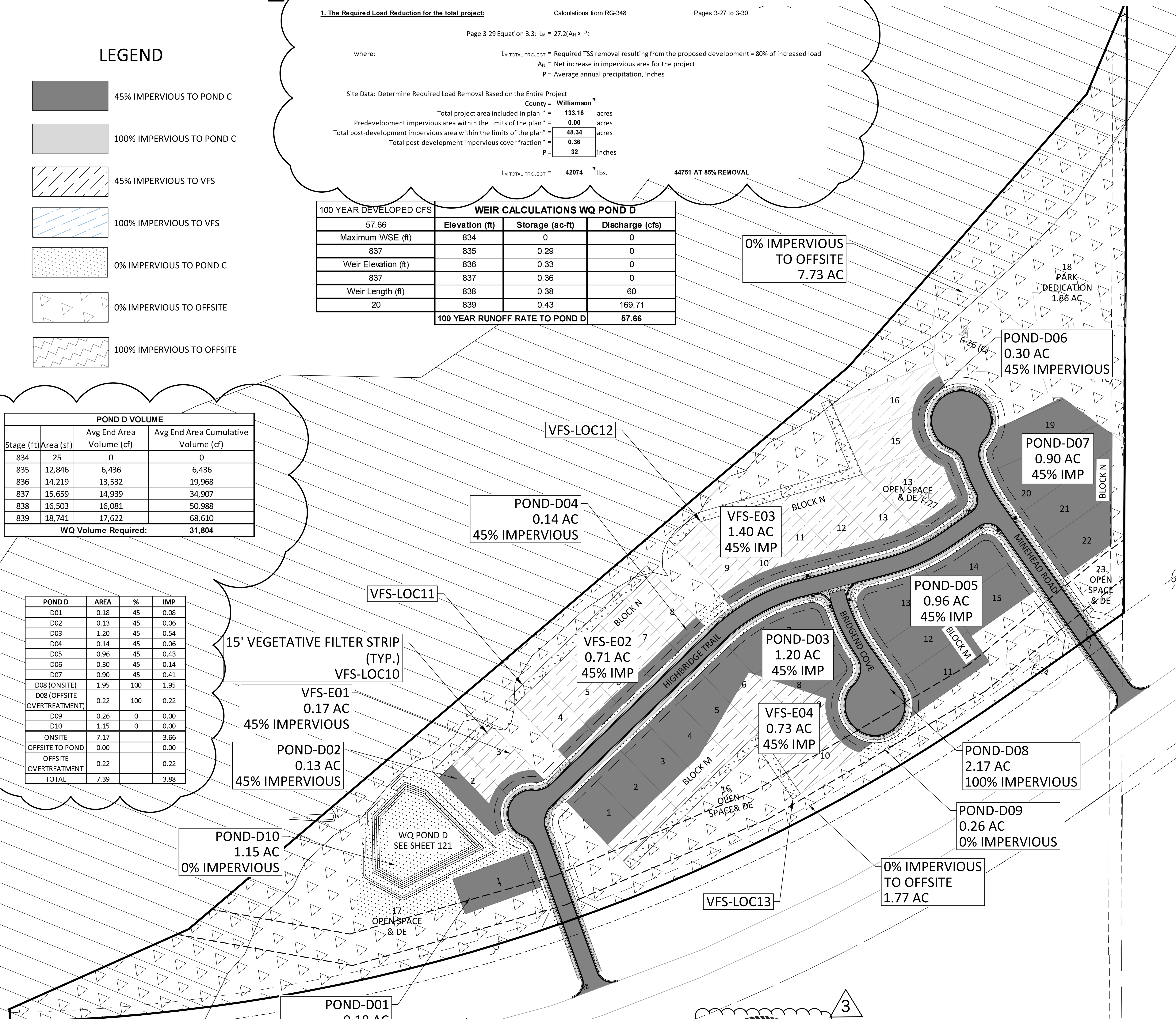
Site Data: Determine Required Load Removal Based on the Entire Project
County = Williamson
Total project area included in plan * = 133.16 acres
Predevelopment impervious area within the limits of the plan * = 0.00 acres
Total post-development impervious area within the limits of the plan* = 48.34 acres
Total post-development impervious cover fraction * = 0.36
P = 32 inches

$L_{M\ TOTAL\ PROJECT}$ = 42074 lbs. 44751 AT 85% REMOVAL

100 YEAR DEVELOPED CFS	WEIR CALCULATIONS WQ POND D		
57.66	Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
Maximum WSE (ft)	834	0	0
837	835	0.29	0
Weir Elevation (ft)	836	0.33	0
837	837	0.36	0
Weir Length (ft)	838	0.38	60
20	839	0.43	169.71
	100 YEAR RUNOFF RATE TO POND D		57.66

POND D VOLUME			
Stage (ft)	Area (sf)	Avg End Area Volume (cf)	Avg End Area Cumulative Volume (cf)
834	25	0	0
835	12,846	6,436	6,436
836	14,219	13,532	19,968
837	15,659	14,939	34,907
838	16,503	16,081	50,988
839	18,741	17,622	68,610
WQ Volume Required:			31,804

POND D	AREA	%	IMP
D01	0.18	45	0.08
D02	0.13	45	0.06
D03	1.20	45	0.54
D04	0.14	45	0.06
D05	0.96	45	0.43
D06	0.30	45	0.14
D07	0.90	45	0.41
D08 (ONSITE)	1.95	100	1.95
D08 (OFFSITE OVERTREATMENT)	0.22	100	0.22
D09	0.26	0	0.00
D10	1.15	0	0.00
ONSITE	7.17		3.66
OFFSITE TO POND	0.00		0.00
OFFSITE OVERTREATMENT	0.22		0.22
TOTAL	7.39		3.88



0 100 200 Feet

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = POND D

Total drainage basin/outfall area = 19.77 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 3.88 acres
Post-development impervious fraction within drainage basin/outfall area = 0.20
$L_{M\ THIS\ BASIN}$ = 3381 lbs. 3596 AT 85% REMOVAL

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
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 = 7.17 acres
A_I = 3.66 acres
A_P = 3.51 acres
L_R = 3747 lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 3596 lbs.
F = 0.96

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 = 2.80 inches
Post Development Runoff Coefficient = 0.36
On-site Water Quality Volume = 26503 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 = 5301
Total Capture Volume (required water quality volume(s) x 1.20) = 31804 cubic feet

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = VFS - PH E

Total drainage basin/outfall area = 3.01 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 1.35 acres
Post-development impervious fraction within drainage basin/outfall area = 0.45
$L_{M\ THIS\ BASIN}$ = 1179 lbs. 1254 AT 85% REMOVAL

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 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 = 3.01 acres
A_I = 1.35 acres
A_P = 1.66 acres
L_R = 1299 lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 1254 lbs.
F = 0.97

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

PHASE E WATER QUALITY PLAN

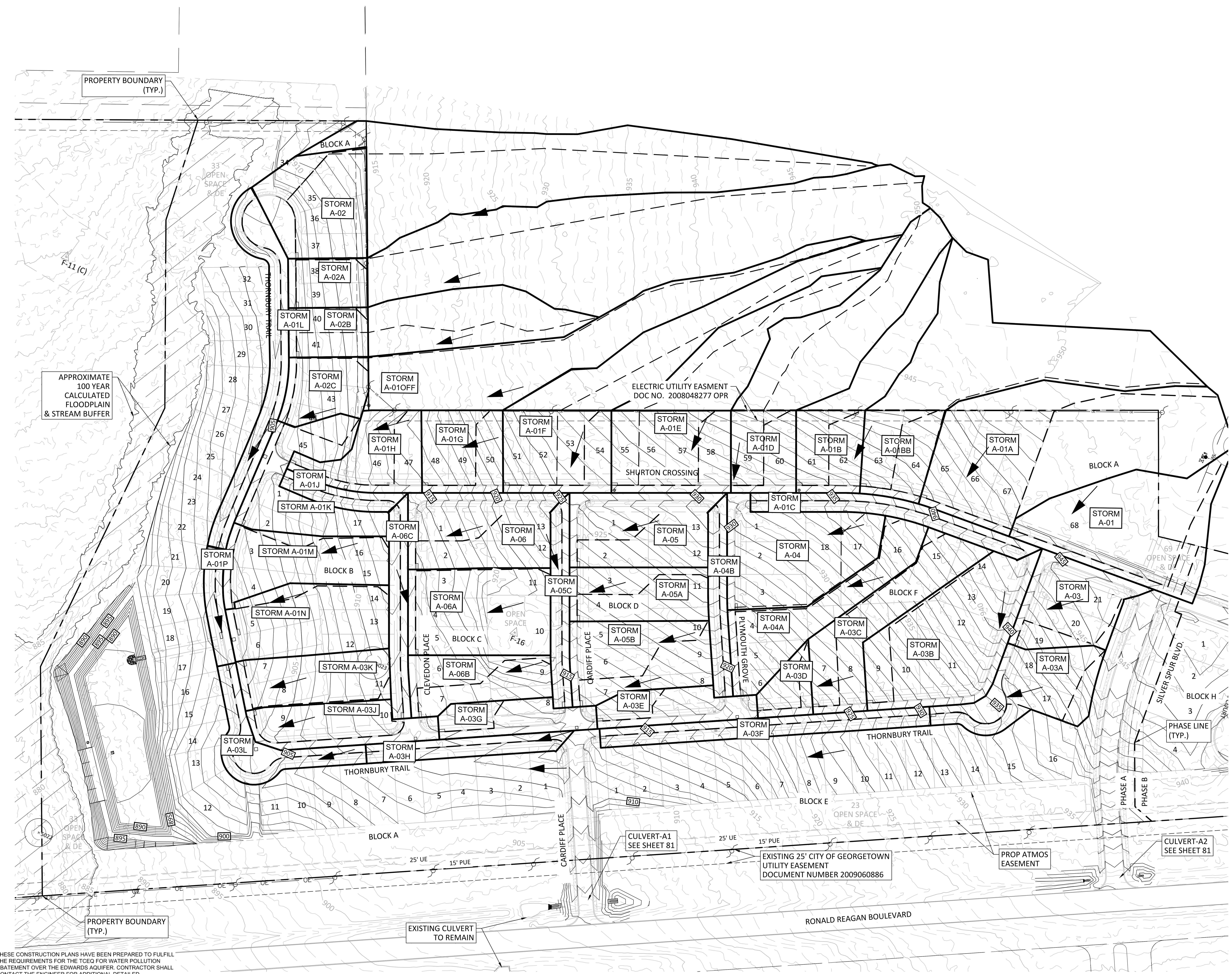
SOMERSET HILLS - PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.	
Sheet Number:	17 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\17 PHASE E WATER QUALITY PLAN.dwg By: Kevin Langford Date: 5/7/2024 8:44 AM



0 100 200 Feet

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

NOTES:

1. IMPERVIOUS COVER WAS CALCULATED WITH A WEIGHTED C VALUE WITH LOTS BEING CALCULATED AT 60% IMPERVIOUS COVER
2. A C VALUE OF 0.97 WAS USED FOR ALL IMPERVIOUS COVER
3. A PERVIOUS COVER VALUES WERE DETERMINED BY THE GEORGETOWN DCM TABLE 3-1 WITH THE AREA DETERMINED TO BE GRASS 75%+ COVER WITH 2-7% SLOPES
4. SUBBASIN A-2OFF DRAINS TO A STORM MANHOLE THAT CAN BE TIED INTO WHEN DEVELOPMENT OF THE PROPERTY TO THE NORTH OCCURS
5. BEFORE DEVELOPMENT SUBBASIN A-01OFF WILL SHEET FLOW INTO SUBBASINS A-02C AND A-01 - A-01D.

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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-A INLET CALCULATIONS (1 OF 2)

SOMERSET HILLS - PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	18 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\18 STRM-A INLET CALCULATIONS (1 OF 2).dwg By: Kevin Langford Date: 5/7/2024 12:34 PM

3

HYDROLOGIC SUMMARY TABLE

SUB-AREA	AREA (ACRES)	BUILDINGS (ACRES)	BUILDINGS (%)	ROADWAY/ SIDEWALKS (ACRES)	ROADWAY/ SIDEWALKS (%)	GRASS (ACRES)	GRASS (%)	TC CALC (MIN)	TC USED (MIN)	i2	i10	i25	i100	c2	c10	c25	c100
A-01	1.37	0.41	29.76%	0.17	12.07%	0.80	58.17%	23.22	23.22	3.73	5.25	6.16	7.59	0.58	0.61	0.63	0.67
A-01A	2.37	0.89	37.79%	0.16	6.71%	1.31	55.50%	28.44	28.44	3.34	4.75	5.61	6.93	0.60	0.63	0.65	0.69
A-01B	0.43	0.22	50.48%	0.05	12.69%	0.16	36.83%	10.65	10.65	5.26	7.14	8.24	10.03	0.72	0.74	0.75	0.78
A-01BB	0.48	0.25	51.92%	0.05	10.75%	0.18	37.33%	11.91	11.91	5.05	6.88	7.96	9.71	0.72	0.74	0.75	0.78
A-01C	0.43	0.07	16.52%	0.25	57.97%	0.11	25.51%	2.64	5.00	6.48	8.64	9.84	11.88	0.79	0.80	0.81	0.83
A-01D	0.42	0.21	50.00%	0.08	19.73%	0.13	30.27%	10.01	10.01	5.37	7.28	8.39	10.21	0.77	0.78	0.79	0.81
A-01E	0.77	0.38	50.23%	0.10	13.18%	0.28	36.59%	4.45	5.00	6.48	8.64	9.84	11.88	0.73	0.74	0.76	0.78
A-01F	0.70	0.35	50.24%	0.09	13.14%	0.26	36.62%	5.92	5.92	6.24	8.35	9.53	11.52	0.73	0.74	0.75	0.78
A-01G	0.52	0.26	50.15%	0.07	13.13%	0.19	36.72%	8.64	8.64	5.63	7.61	8.74	10.61	0.73	0.74	0.75	0.78
A-01OFF	14.47	8.68	60.00%	0.00	0.00%	5.79	40.00%	21.39	21.39	3.90	5.45	6.39	7.86	0.71	0.73	0.74	0.77
A-01H	0.55	0.22	39.46%	0.12	21.02%	0.22	39.53%	6.90	6.90	6.01	8.06	9.23	11.17	0.70	0.72	0.74	0.76
A-01J	0.18	0.03	16.39%	0.10	58.15%	0.05	25.46%	7.44	7.44	5.88	7.91	9.07	10.99	0.79	0.80	0.81	0.83
A-01K	0.71	0.34	47.48%	0.12	16.69%	0.26	35.83%	8.52	8.52	5.66	7.63	8.77	10.65	0.73	0.75	0.76	0.78
A-01L	0.62	0.07	11.78%	0.37	58.80%	0.18	29.42%	8.04	8.04	5.76	7.76	8.90	10.80	0.76	0.78	0.79	0.81
A-01M	0.71	0.37	52.47%	0.07	10.04%	0.26	37.49%	21.06	21.06	3.93	5.49	6.43	7.91	0.72	0.74	0.75	0.78
A-01N	0.83	0.46	55.82%	0.05	5.57%	0.32	38.61%	21.78	21.78	3.86	5.41	6.34	7.80	0.71	0.73	0.74	0.77
A-01P	0.18	0.03	17.60%	0.10	56.53%	0.05	25.87%	7.32	7.32	5.91	7.95	9.10	11.03	0.79	0.80	0.81	0.83
A-02	0.79	0.43	55.06%	0.12	15.19%	0.23	29.75%	9.33	9.33	5.50	7.44	8.56	10.40	0.77	0.79	0.79	0.82
A-02A	0.31	0.15	49.74%	0.04	13.69%	0.11	36.58%	4.20	5.00	6.48	8.64	9.84	11.88	0.73	0.74	0.76	0.78
A-02B	0.31	0.15	49.74%	0.04	13.69%	0.11	36.58%	4.44	5.00	6.48	8.64	9.84	11.88	0.73	0.74	0.76	0.78
A-02C	0.40	0.20	50.01%	0.06	14.23%	0.14	35.76%	4.76	5.00	6.48	8.64	9.84	11.88	0.73	0.75	0.76	0.78
A-03	0.67	0.24	35.36%	0.17	25.42%	0.26	39.22%	13.56	13.56	4.80	6.58	7.63	9.32	0.71	0.73	0.74	0.76
A-03A	0.70	0.26	36.58%	0.16	23.14%	0.28	40.28%	17.22	17.22	4.33	5.99	6.99	8.56	0.70	0.72	0.73	0.76
A-03B	1.32	0.63	47.36%	0.22	16.85%	0.47	35.79%	16.02	16.02	4.47	6.17	7.18	8.80	0.73	0.75	0.76	0.78
A-03C	0.80	0.45	55.71%	0.05	5.72%	0.31	38.57%	8.22	8.22	5.72	7.71	8.85	10.74	0.71	0.73	0.75	0.77
A-03D	0.21	0.09	43.50%	0.05	21.99%	0.07	34.50%	12.72	12.72	4.92	6.73	7.79	9.51	0.74	0.76	0.77	0.79
A-03E	0.39	0.12	30.50%	0.15	39.33%	0.12	30.17%	4.32	5	6.48	8.64	9.84	11.88	0.76	0.78	0.79	0.81
A-03F	0.49	0.08	16.90%	0.28	57.14%	0.13	25.95%	3.60	5.00	6.48	8.64	9.84	11.88	0.79	0.80	0.81	0.83
A-03G	0.38	0.12	30.32%	0.15	39.57%	0.12	30.11%	5.28	5.28	6.40	8.55	9.74	11.77	0.76	0.78	0.79	0.81
A-03H	0.30	0.05	16.32%	0.17	57.98%	0.08	25.71%	8.04	8.04	5.76	7.76	8.90	10.80	0.79	0.80	0.81	0.83
A-03J	0.55	0.19	34.15%	0.19	34.46%	0.17	31.38%	7.74	7.74	5.82	7.83	8.98	10.89	0.76	0.77	0.78	0.80
A-03K	0.58	0.32	54.53%	0.04	7.29%	0.22	38.18%	9.96	9.96	5.38	7.29	8.41	10.22	0.72	0.74	0.75	0.77
A-03L	0.41	0.06	14.51%	0.25	59.30%	0.11	26.19%	7.80	7.8	5.81	7.82	8.97	10.87	0.79	0.80	0.81	0.82
A-04	1.03	0.54	52.16%	0.11	10.45%	0.39	37.39%	8.82	8.82	5.60	7.56	8.69	10.55	0.72	0.74	0.75	0.78
A-04A	0.77	0.40	52.85%	0.07	9.53%	0.29	37.62%	5.70	5.7	6.30	8.42	9.60	11.61	0.72	0.74	0.75	0.78
A-04B	0.29	0.05	16.47%	0.17	58.04%	0.07	25.49%	7.74	7.74	5.82	7.83	8.98	10.89	0.79	0.80	0.81	0.83
A-05	0.82	0.36	43.45%	0.18	22.06%	0.28	34.48%	8.94	8.94	5.57	7.53	8.66	10.52	0.74	0.76	0.77	0.79
A-05A	0.58	0.31	54.09%	0.05	7.87%	0.22	38.03%	7.08	7.08	5.97	8.01	9.17	11.11	0.72	0.74	0.75	0.77
A-05B	0.79	0.42	53.19%	0.07	9.08%	0.30	37.73%	7.26	7.26	5.92	7.96	9.12	11.05	0.72	0.74	0.75	0.78
A-05C	0.30	0.03	11.34%	0.18	58.00%	0.09	30.65%	7.50	7.5	5.87	7.90	9.05	10.97	0.76	0.77	0.78	0.80
A-06	0.85	0.37	43.73%	0.18	21.69%	0.29	34.58%	10.08	10.08	5.36	7.27	8.38	10.19	0.74	0.75	0.77	0.79
A-06A	0.96	0.35	35.92%	0.07	7.53%	0.54	56.55%	9.84	9.84	5.40	7.32	8.44	10.26	0.60	0.62	0.64	0.68
A-06B	0.55	0.28	50.53%	0.05	9.65%	0.22	39.82%	10.44	10.44	5.29	7.19	8.29	10.09	0.71	0.73	0.74	0.77
A-06C	0.32	0.05	16.33%	0.19	58.22%	0.08	25.44%	7.56	7.56	5.86	7.88	9.04	10.95	0.79	0.80	0.81	0.83

25-YR INLET RESULTS

Inlet ID	Bypass Inlet ID	Total Runoff (CFS)	Qcarryover (CFS)	Qcaptured (CFS)	Qbypass (CFS)	Gutter Depth (CFS)	Gutter Spread (CFS)	Gutter Longitudinal Slope (FT/ FT)	Gutter Cross Slope (SW) (FT/ FT)	Road Cross Slope (Sx) (FT/FT)
A01	A01-A	5.66	0	4.72	0.94	0.25	12.55	0.011	0.02	0.02
A01-A	A01-BB	9.16	0.94	5.74	4.35	0.27	13.27	0.026	0.02	0.02
A01-BB	A01-B	2.98	4.35	4.84	2.5	0.24	11.77	0.026	0.02	0.02
A01-B	A01-D	2.76	2.5	4	1.27	0.21	10.4	0.026	0.02	0.02
A01-C	A04	3.51	0	3.19	0.32	0.19	9.38	0.02	0.02	0.02
A01-D	A01-E	2.86	1.27	3.56	0.57	0.2	9.97	0.02	0.02	0.02
A01-E	A01-F	5.91	0.57	4.7	1.78	0.24	11.8	0.02	0.02	0.02
A01-F	A01-G	5.21	1.78	4.22	2.77	0.2	10.23	0.05	0.02	0.02
A01-G	A01-H	3.41	2.77	4	2.18	0.2	9.92	0.046	0.02	0.02
A01-H	A01-K	3.86	2.18	4.51	1.53	0.23	11.49	0.02	0.02	0.02
A01-J	A01-K	1.36	0	1.36	0	0.13	6.57	0.02	0.02	0.02
A01-K	A01-M	4.86	1.53	4.87	1.52	0.25	12.39	0.015	0.02	0.02
A01-L	A01-P	4.46	0	3.88	0.58	0.22	10.83	0.015	0.02	0.02
A01-M	A01-N	3.56	1.52	4.23	0.85	0.23	11.37	0.015	0.02	0.02
A01-N	Sag	4.05	2.11	6.16	0	0.35	17.71	Sag	0.02	0.02
A01-OFF	N/A	71.18	N/A	71.18	N/A	N/A	N/A	N/A	N/A	N/A
A01-P	Sag	1.36	0.74	2.1	0	0.17	8.65	Sag	0.02	0.02
A02-A	A02-B	2.38	0.43	2.81	0	0.22	11.19	0.005	0.02	0.02
A02-B	A02-C	2.38	0	2.38	0	0.21	10.52	0.005	0.02	0.02
A02-C	A01-M	3.07	0	3.07	0	0.23	11.57	0.005	0.02	0.02
A02	A02-A	5.55	0	5.12	0.43	0.29	14.44	0.005	0.02	0.02
A03	A03-A	3.88	0	3.13	0.75	0.17	8.6	0.039	0.02	0.02
A03-A	A03-F	3.72	0.75	3.41	1.05	0.18	9.06	0.039	0.02	0.02
A03-B	A03-C	7.4	0	4.54	2.86	0.22	10.95	0.039	0.02	0.02
A03-C	A03-D	5.46	2.86	4.83	3.49	0.23	11.44	0.039	0.02	0.02
A03-D	A03-E	1.29	3.49	3.91	0.87	0.21	10.53	0.02	0.02	0.02
A03-E	A03-G	3.11	4.65	5.21	2.55	0.25	12.63	0.02	0.02	0.02
A03-F	Offsite	4	1.05	4.05	1	0.22	10.76	0.02	0.02	0.02
A03-G	A03-J	3	5.21	6.21	1.99	0.31	15.31	0.008	0.02	0.02
A03-H	A03-L	2.22	0	2.21	0.01	0.16	7.9	0.02	0.02	0.02
A03-J	A03-K	3.96	2.57	4.72	1.81	0.24	11.84	0.02	0.02	0.02
A03-K	A01-N	3.75	1.81	4.29	1.26	0.22	11.14	0.02	0.02	0.02
A03-L	A01-P	3.02	0.01	2.86	0.16	0.18	8.87	0.02	0.02	0.02
A04-A	A03-E	5.77	2.82	4.89	3.7	0.23	11.52	0.04	0.02	0.02
A04-B	A03-E	2.17	0	2.08	0.08	0.14	6.87	0.04	0.02	0.02
A04	A04-A	6.99	0.32	4.49	2.82	0.22	10.85	0.04	0.02	0.02
A05-A	A05-B	4.09	1.59	4.05	1.64	0.21	10.3	0.032	0.02	0.02
A05-B	A03-G	5.61	1.64	4.64	2.61	0.23	11.27	0.032	0.02	0.02
A05-C	A03-G	2.17	0	2.12	0.05	0.14	7.18	0.032	0.02	0.02
A05	A05-A	5.62	0	4.02	1.59	0.2	10.25	0.032	0.02	0.02
A06-A	A06-B	5.51	0.92	5.12	1.32	0.26	13.17	0.011	0.02	0.02
A06-B	A03-J	3.51	1.32	4.25	0.57	0.24	11.82	0.011	0.02	0.02
A06-C	A03-J	2.4	0	2.4	0	0.18	9.1	0.011	0.02	0.02
A06	A06-A	5.62	0	4.7	0.92	0.25	12.52	0.011	0.02	0.02

100-YR INLET RESULTS

Inlet ID	Bypass Inlet	Total Runoff (CFS)	Qcarryover (CFS)	Qcaptured (CFS)	Qbypass (CFS)	Gutter Depth (CFS)	Gutter Spread (CFS)	Gutter Slope (FT/FT)	Gutter Cross Slope (SW) (FT/ FT)	Road Cross Slope (Sx) (FT/FT)
A01	A01-A	6.97	0	5.37	1.6	0.27	13.57	0.011	0.02	0.02
A01-A	A01-BB	11.33	1.6	6.52	6.41	0.29	14.56	0.026	0.02	0.02
A01-BB	A01-B	3.64	6.41	5.73	4.32	0.26	13.25	0.026	0.02	0.02
A01-B	A01-D	3.37	4.32	4.96	2.72	0.24	11.98	0.026	0.02	0.02
A01-C	A04	4.24	0	3.62	0.62	0.2	10.07	0.02	0.02	0.02
A01-D	A01-E	3.47	2.72	4.58	1.62	0.23	11.61	0.02	0.02	0.02
A01-E	A01-F	7.14	1.62	5.56	3.19	0.26	13.21	0.02	0.02	0.02
A01-F	A01-G	6.3	3.19	4.95	4.54	0.23	11.47	0.05	0.02	0.02
A01-G	A01-H	4.12	4.54	4.79	3.87	0.23	11.26	0.046	0.02	0.02
A01-H	A01-K	4.67	3.87	5.49	3.05	0.26	13.09	0.02	0.02	0.02
A01-J	A01-K	1.64	0	1.64	0	0.14	7.06	0.02	0.02	0.02
A01-K	A01-M	5.9	3.05	5.91	3.04	0.28	14.06	0.015	0.02	0.02
A01-L	A01-P	5.41	0	4.4	1.01	0.23	11.65	0.015	0.02	0.02
A01-M	A01-N	4.38	3.05	5.32	2.11	0.26	13.12	0.015	0.02	0.02
A01-N	Sag	4.99	5.67	10.65	0	0.51	25.52	Sag	0.02	0.02
A01-OFF	N/A	87.6	0	87.6	0	....	....	....	....	....
A01-P	Sag	1.65	1.42	3.07	0	0.22	11.13	Sag	0.02	0.02
A02-A	A02-B	2.87	0.89	3.74	0.02	0.25	12.48	0.005	0.02	0.02
A02-B	A02-C	2.87	0.02	2.89	0	0.23	11.31	0.005	0.02	0.02
A02-C	A01-M	3.71	0	3.7	0.01	0.25	12.42	0.005	0.02	0.02
A02	A02-A	6.75	0	5.86	0.89	0.31	15.54	0.005	0.02	0.02
A03	A03-A	4.74	0	3.54	1.21	0.19	9.27	0.039	0.02	0.02
A03-A	A03-F	4.56	1.21	3.96	1.81	0.2	9.97	0.039	0.02	0.02
A03-B	A03-C	9.06	0	5.05	4.01	0.24	11.81	0.039	0.02	0.02
A03-C	A03-D	6.62	4.01	5.48	5.15	0.25	12.54	0.039	0.02	0.02
A03-D	A03-E	1.58	5.15	4.8	1.92	0.24	11.97	0.02	0.02	0.02
A03-E	A03-G	3.75	7.62	6.4	4.97	0.29	14.57	0.02	0.02	0.02
A03-F	Offsite	4.83	1.81	4.77	1.87	0.24	11.91	0.02	0.02	0.02
A03-G	A03-J	3.62	9.24	8.02	4.84	0.36	18.12	0.008	0.02	0.02
A03-H	A03-L	2.69	0	2.61	0.08	0.17	8.49	0.02	0.02	0.02
A03-J	A03-K	4.8	6.26	6.3	4.75	0.29	14.42	0.02	0.02	0.02
A03-K	A01-N	4.56	4.75	5.75	3.56	0.27	13.52	0.02	0.02	0.02
A03-L	A01-P	3.66	0.08	3.33	0.41	0.19	9.61	0.02	0.02	0.02
A04-A	A03-E	6.97	4.06	5.56	5.47	0.25	12.66	0.04	0.02	0.02
A04-B	A03-E	2.63	0	2.41	0.22	0.15	7.39	0.04	0.02	0.02
A04	A04-A	8.49	0.62	5.04	4.06	0.24	11.78	0.04	0.02	0.02
A05-A	A05-B	4.96	2.33	4.66	2.64	0.23	11.3	0.032	0.02	0.02
A05-B	A03-G	6.8	2.64	5.34	4.1	0.25	12.45	0.032	0.02	0.02
A05-C	A03-G	2.63	0	2.47	0.17	0.15	7.71	0.032	0.02	0.02
A05	A05-A	6.82	0	4.49	2.33	0.22	11.02	0.032	0.02	0.02
A06-A	A06-B	6.71	1.53	5.93	2.31	0.29	14.44	0.011	0.02	0.02
A06-B	A03-J	4.27	2.31	5.18	1.39	0.27	13.28	0.011	0.02	0.02
A06-C	A03-J	2.91	0	2.88	0.02	0.2	9.78	0.011	0.02	0.02
A06	A06-A	6.84	0	5.31	1.53	0.27	13.48	0.011	0.02	0.02

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

DESIGNED BY: TLH, CL, EJH, TG — DATE: 03-15-2024
DRAWN BY: TEH, TG, CL, EJH — DATE: 03-15-2024
CHECKED BY: TLH — DATE: 03-15-2024
APPROVED BY: TLH — DATE: 03-15-2024

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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-A INLET CALCULATIONS (2 OF 2)

SOMERSET HILLS - PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.
Sheet Number: 19 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\19 STRM-A INLET CALCULATIONS (2 OF 2).dwg By: Kevin Langford Date: 5/7/2024 12:34 PM

3

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

NOTES:

1. IMPERVIOUS COVER WAS CALCULATED WITH A WEIGHTED C VALUE WITH LOTS BEING CALCULATED AT 65% IMPERVIOUS COVER
2. A C VALUE OF 0.97 WAS USED FOR ALL IMPERVIOUS COVER
3. A PERVIOUS COVER VALUES WERE DETERMINED BY THE GEORGETOWN DCM TABLE 3-1 WITH THE AREA DETERMINED TO BE GRASS 75%+ COVER WITH 2-7% SLOPES

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS — TYSON L. HASZ — 145151 — LICENSED PROFESSIONAL ENGINEER
5/7/2024

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-B INLET CALCULATIONS (1 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	20 of 218 sheets

2021-21-CON

3

HYDROLOGIC SUMMARY TABLE

SUB-AREA	AREA (ACRES)	BUILDINGS (ACRES)	BUILDINGS (%)	ROADWAY/ SIDEWALKS (ACRES)	ROADWAY/ SIDEWALKS (%)	GRASS (ACRES)	GRASS (%)	TC CALC (MIN)	TC USED (MIN)	i2	i10	i25	i100	c2	c10	c25	c100
B01	0.15	0.02	14.46%	0.09	60.72%	0.04	24.82%	7.44	7.44	5.88	7.91	9.07	10.99	0.79	0.81	0.81	0.83
B01-A	1.15	0.11	10.02%	0.15	12.85%	0.88	77.13%	27.48	27.48	3.41	4.83	5.70	7.04	0.46	0.50	0.52	0.57
B01-B	0.99	0.40	40.13%	0.26	26.49%	0.33	33.38%	15.06	15.06	4.59	6.32	7.35	8.99	0.74	0.76	0.77	0.79
B01-C	0.42	0.07	16.83%	0.24	57.56%	0.11	25.61%	5.46	5.46	6.36	8.49	9.68	11.70	0.79	0.80	0.81	0.83
B01-D	0.89	0.46	51.93%	0.10	10.76%	0.33	37.31%	16.62	16.62	4.40	6.08	7.08	8.68	0.72	0.74	0.75	0.78
B01-E	0.38	0.10	26.16%	0.17	45.12%	0.11	28.72%	4.56	5.00	6.48	8.64	9.84	11.88	0.77	0.79	0.79	0.81
B01-F	0.50	0.20	39.25%	0.14	27.67%	0.17	33.08%	10.50	10.50	5.28	7.18	8.28	10.07	0.75	0.76	0.77	0.80
B01-G	0.96	0.39	40.49%	0.19	19.76%	0.38	39.75%	14.04	14.04	4.73	6.49	7.54	9.21	0.70	0.72	0.74	0.76
B01-H	0.20	0.00	0.00%	0.16	80.00%	0.04	20.00%	3.25	5.00	6.48	8.64	9.84	11.88	0.82	0.83	0.84	0.85
B01-J	0.65	0.12	17.66%	0.37	56.45%	0.17	25.89%	6.33	6.33	6.14	8.23	9.40	11.37	0.79	0.80	0.81	0.83
B02	1.75	0.71	40.32%	0.18	10.35%	0.86	49.33%	24.36	24.36	3.64	5.13	6.03	7.44	0.64	0.67	0.68	0.72
B03	0.43	0.19	43.52%	0.10	21.98%	0.15	34.51%	19.98	19.98	4.03	5.62	6.58	8.08	0.74	0.76	0.77	0.79
B03-A	1.13	0.49	43.74%	0.21	18.67%	0.42	37.58%	20.70	20.70	3.96	5.53	6.48	7.97	0.72	0.74	0.75	0.77
B03-B	0.36	0.17	46.80%	0.06	17.61%	0.13	35.60%	7.38	7.38	5.90	7.93	9.09	11.01	0.73	0.75	0.76	0.78
B03-C	0.23	0.04	18.12%	0.13	55.84%	0.06	26.04%	7.50	7.50	5.87	7.90	9.05	10.97	0.79	0.80	0.81	0.83
B03-D	0.36	0.12	34.43%	0.12	34.09%	0.11	31.48%	7.62	7.62	5.85	7.87	9.02	10.93	0.76	0.77	0.78	0.80
B04	1.21	0.63	51.88%	0.11	8.89%	0.47	39.23%	13.74	13.74	4.77	6.54	7.59	9.28	0.71	0.73	0.74	0.77
B04-A	0.29	0.04	15.43%	0.17	59.43%	0.07	25.14%	8.16	8.16	5.73	7.73	8.87	10.76	0.79	0.80	0.81	0.83
B04-B	0.88	0.49	55.34%	0.05	6.21%	0.34	38.45%	6.54	6.54	6.09	8.17	9.34	11.30	0.72	0.73	0.75	0.77
B05	1.01	0.09	9.12%	0.05	5.29%	0.87	85.60%	18.66	18.66	4.17	5.79	6.77	8.31	0.40	0.45	0.47	0.53
B05-A	0.70	0.33	47.44%	0.12	16.75%	0.25	35.81%	17.10	17.10	4.34	6.01	7.01	8.59	0.73	0.75	0.76	0.78
B05-B	0.37	0.18	48.85%	0.06	14.87%	0.13	36.28%	16.32	16.32	4.43	6.12	7.13	8.74	0.73	0.75	0.76	0.78
B05-C	0.72	0.29	40.07%	0.19	26.57%	0.24	33.36%	15.72	15.72	4.51	6.22	7.23	8.86	0.74	0.76	0.77	0.79
B05-D	1.09	0.50	45.91%	0.20	18.79%	0.38	35.30%	26.88	26.88	3.45	4.89	5.76	7.11	0.73	0.75	0.76	0.79
B05-E	1.12	0.61	53.99%	0.09	8.01%	0.43	38.00%	12.18	12.18	5.00	6.83	7.91	9.64	0.72	0.74	0.75	0.77
B05-F	0.85	0.47	55.10%	0.06	6.53%	0.32	38.37%	10.56	10.56	5.27	7.16	8.26	10.06	0.72	0.73	0.75	0.77
B05-G	0.70	0.38	54.05%	0.06	7.93%	0.26	38.02%	11.70	11.7	5.08	6.93	8.01	9.76	0.72	0.74	0.75	0.77
B05-H	0.38	0.00	0.00%	0.31	80.00%	0.08	20.00%	7.98	7.98	5.77	7.77	8.92	10.82	0.82	0.83	0.84	0.85
B05-J	0.74	0.39	52.19%	0.08	10.41%	0.28	37.40%	17.52	17.52	4.29	5.95	6.94	8.51	0.72	0.74	0.75	0.78
B05-K	0.44	0.01	3.12%	0.24	54.41%	0.19	42.47%	6.36	6.36	6.13	8.22	9.39	11.36	0.68	0.70	0.71	0.74
B05-L	0.85	0.43	50.78%	0.11	12.30%	0.32	36.93%	26.46	26.46	3.48	4.93	5.80	7.17	0.72	0.74	0.75	0.78
B06	0.82	0.22	27.10%	0.09	10.35%	0.52	62.55%	19.08	19.08	4.12	5.74	6.71	8.23	0.56	0.59	0.61	0.65
B06-A	0.71	0.23	32.53%	0.07	10.39%	0.40	57.09%	18.72	18.72	4.16	5.78	6.76	8.30	0.59	0.62	0.64	0.68
B06-B	0.76	0.17	21.74%	0.05	6.04%	0.55	72.22%	17.94	17.94	4.25	5.89	6.87	8.43	0.49	0.53	0.55	0.60
B06-C	0.37	0.13	34.85%	0.05	12.56%	0.19	52.59%	10.83	10.83	5.23	7.10	8.20	9.99	0.62	0.65	0.66	0.70
B06-D	0.37	0.06	16.47%	0.22	58.04%	0.09	25.49%	5.06	5.06	6.46	8.62	9.82	11.85	0.79	0.80	0.81	0.83
B06-E	1.14	0.20	17.84%	0.05	4.03%	0.89	78.13%	16.14	16.14	4.46	6.15	7.16	8.77	0.45	0.49	0.52	0.57
B06-F	0.48	0.17	34.74%	0.05	9.65%	0.26	55.61%	15.96	15.96	4.48	6.18	7.19	8.81	0.60	0.63	0.65	0.68
B06-G	1.26	0.17	13.15%	0.05	3.65%	1.05	83.19%	16.56	16.56	4.40	6.09	7.09	8.69	0.42	0.46	0.49	0.54
B06-H	0.29	0.05	17.14%	0.17	57.14%	0.07	25.71%	3.78	5	6.48	8.64	9.84	11.88	0.79	0.80	0.81	0.83
B06-J	0.78	0.16	20.93%	0.08	10.10%	0.54	68.98%	18.00	18	4.24	5.88	6.87	8.42	0.51	0.55	0.57	0.62
B07	11.85	2.12	17.90%	0.31	2.61%	9.42	79.48%	32.49	32.49	3.09	4.43	5.25	6.50	0.44	0.48	0.51	0.56
B07-A	0.54	0.00	0.29%	0.14	26.37%	0.40	73.34%	23.46	23.46	3.71	5.22	6.13	7.56	0.48	0.52	0.54	0.59
B07-B	0.18	0.00	0.00%	0.14	80.00%	0.04	20.00%	10.44	10.44	5.29	7.19	8.29	10.09	0.82	0.83	0.84	0.85

25-YR INLET RESULTS

Inlet ID	Bypass Inlet ID	Total Runoff (CFS)	Qcarryover (CFS)	Qcaptured (CFS)	Qbypass (CFS)	Gutter Depth (CFS)	Gutter Spread (CFS)	Gutter Longitudinal Slope (FT/FT)	Gutter Cross Slope (SW) (FT/FT)	Road Cross Slope (Sx) (FT/FT)
B01	Offsite	1.14	0	1.14	0	0.13	6.67	0.013	0.02	0.02
B01-A	B01-B	3.72	0	3.45	0.27	0.21	10.25	0.014	0.02	0.02
B01-B	B01-D	5.74	3.13	4.87	4	0.23	11.41	0.045	0.02	0.02
B01-C	B01-E	3.39	0	2.88	0.51	0.16	8.21	0.038	0.02	0.02
B01-D	B01-J	4.94	4	5.63	3.31	0.27	13.32	0.02	0.02	0.02
B01-E	B01-F	3	0.51	3.18	0.32	0.19	9.38	0.02	0.02	0.02
B01-F	B01-G	3.31	0.32	2.89	0.75	0.16	7.95	0.052	0.02	0.02
B01-G	Sag	5.51	0.75	6.26	0	0.36	17.89	Sag	0.02	0.02
B01-H	Sag	1.68	3.09	4.77	0	0.3	14.92	Sag	0.02	0.02
B01-J	B01-H	5.07	5.59	7.57	3.09	0.36	17.82	0.006	0.02	0.02
B02	B01-B	7.6	0	4.74	2.86	0.23	11.41	0.033	0.02	0.02
B03	B03-B	2.26	0	2.1	0.16	0.13	6.63	0.053	0.02	0.02
B03-A	B03-C	5.62	0	3.71	1.91	0.19	9.32	0.053	0.02	0.02
B03-B	B03-D	2.58	0.16	2.4	0.34	0.14	7.13	0.053	0.02	0.02
B03-C	B01-J	1.76	1.91	3.25	0.42	0.19	9.37	0.022	0.02	0.02
B03-D	B01-J	2.59	0.34	2.77	0.16	0.17	8.62	0.022	0.02	0.02
B04	B04-B	7.08	0	4.95	2.13	0.24	12.2	0.02	0.02	0.02
B04A-L	B01-J	2.15	0	2.15	0	0.2	10.12	0.005	0.02	0.02
B04B-L	B01-J	6.35	2.13	6.79	1.69	0.34	16.93	0.005	0.02	0.02
B05	Offsite	3.64	0	3.5	0.14	0.22	10.83	0.01	0.02	0.02
B05-A	B05-B	3.81	0	3.62	0.19	0.22	11.02	0.01	0.02	0.02
B05-B	B05-C	2.06	0.19	2.25	0	0.21	10.3	0.005	0.02	0.02
B05-C	B05-H	3.96	0	3.89	0.08	0.25	12.31	0.006	0.02	0.02
B05-D	B05-E	4.96	0	4.38	0.58	0.24	12.16	0.01	0.02	0.02
B05-E	B05-F	7.04	0.58	5.75	1.87	0.29	14.28	0.01	0.02	0.02
B05-F	B05-G	5.46	1.87	5.62	1.72	0.28	14.07	0.01	0.02	0.02
B05-G	B05-J	4.29	1.72	4.97	1.04	0.26	13.07	0.01	0.02	0.02
B05-H	B05-K	4.2	0.08	3.95	0.33	0.23	11.5	0.01	0.02	0.02
B05-J	Sag	4	1.67	5.67	0	0.34	16.76	Sag	0.02	0.02
B05-K	Sag	3.05	0.33	3.38	0	0.24	11.87	Sag	0.02	0.02
B05-L	B05-J	3.87	0	3.24	0.63	0.18	9.02	0.03	0.02	0.02
B06	Offsite	3.59	0	3.59	0	0.25	12.27	0.005	0.02	0.02
B06-A	B06-B	3.25	0	3.25	0	0.23	11.54	0.006	0.02	0.02
B06-B	B06-C	3.14	0	3.14	0	0.23	11.38	0.006	0.02	0.02
B06-C	B06-E	2.1	0	2.1	0	0.2	9.79	0.006	0.02	0.02
B06-D	B06-H	3.03	0	3.03	0	0.22	11.23	0.006	0.02	0.02
B06-E	B06-F	4.65	0	4.43	0.22	0.26	13.19	0.006	0.02	0.02
B06-F	B06-G	2.33	0.22	2.55	0	0.21	10.52	0.006	0.02	0.02
B06-G	B06-J	4.81	0	4.55	0.26	0.27	13.36	0.006	0.02	0.02
B06-H	B05L	2.38	0	2.38	0	0.21	10.26	0.006	0.02	0.02
B06-J	B05L	3.33	0.26	3.58	0.02	0.24	11.98	0.006	0.02	0.02
B07-A	B01-G	1.95	0	1.95	0	0.15	7.53	0.02	0.02	0.02
B07-B	B01-G	1.27	0	1.27	0	0.13	6.4	0.02	0.02	0.02

100-YR INLET RESULTS

Inlet ID	Bypass Inlet	Total Runoff (CFS)	Qcarryover (CFS)	Qcaptured (CFS)	Qbypass (CFS)	Gutter Depth (CFS)	Gutter Spread (CFS)	Gutter Slope (FT/FT)	Gutter Cross Slope (SW) (FT/ FT)	Road Cross Slope (Sx) (FT/FT)
B01	Offsite	1.38	0	1.38	0	0.14	7.17	0.013	0.02	0.02
B01-A	B01-B	4.6	0	4	0.6	0.22	11.1	0.014	0.02	0.02
B01-B	B01-D	7.02	4.68	5.6	6.09	0.25	12.65	0.045	0.02	0.02
B01-C	B01-E	4.1	0	3.25	0.85	0.18	8.81	0.038	0.02	0.02
B01-D	B01-J	6.06	6.09	6.62	5.53	0.3	14.94	0.02	0.02	0.02
B01-E	B01-F	3.62	0.85	3.75	0.72	0.21	10.27	0.02	0.02	0.02
B01-F	B01-G	4.03	0.72	3.39	1.37	0.18	8.79	0.052	0.02	0.02
B01-G	Sag	6.74	1.37	8.1	0	0.43	21.26	Sag	0.02	0.02
B01-H	Sag	2.03	6.57	8.59	0	0.44	22.11	Sag	0.02	0.02
B01-J	B01-H	6.14	9.94	9.51	6.57	0.42	20.79	0.006	0.02	0.02
B02	B01-B	9.37	0	5.29	4.08	0.25	12.34	0.033	0.02	0.02
B03	B03-B	2.78	0	2.42	0.36	0.14	7.16	0.053	0.02	0.02
B03-A	B03-C	6.91	0	4.15	2.76	0.2	10.07	0.053	0.02	0.02
B03-B	B03-D	3.13	0.36	2.81	0.68	0.16	7.8	0.053	0.02	0.02
B03-C	B01-J	2.14	2.76	3.92	0.98	0.21	10.44	0.022	0.02	0.02
B03-D	B01-J	3.14	0.68	3.34	0.48	0.19	9.51	0.022	0.02	0.02
B04	B04-B	8.65	0	5.53	3.12	0.26	13.16	0.02	0.02	0.02
B04A-L	B01-J	2.61	0	2.61	0	0.22	10.88	0.005	0.02	0.02
B04B-L	B01-J	7.68	3.12	7.85	2.95	0.37	18.54	0.005	0.02	0.02
B05	Offsite	4.47	0	4.08	0.39	0.23	11.7	0.01	0.02	0.02
B05-A	B05-B	4.67	0	4.2	0.47	0.24	11.89	0.01	0.02	0.02
B05-B	B05-C	2.53	0.47	3	0	0.23	11.46	0.005	0.02	0.02
B05-C	B05-H	4.85	0	4.56	0.3	0.27	13.28	0.006	0.02	0.02
B05-D	B05-E	6.13	0	5.03	1.1	0.26	13.17	0.01	0.02	0.02
B05-E	B05-F	8.59	1.1	6.6	3.08	0.31	15.63	0.01	0.02	0.02
B05-F	B05-G	6.64	3.08	6.62	3.11	0.31	15.65	0.01	0.02	0.02
B05-G	B05-J	5.24	3.11	6.06	2.28	0.3	14.78	0.01	0.02	0.02
B05-H	B05-K	5.09	0.3	4.63	0.76	0.25	12.55	0.01	0.02	0.02
B05-J	Sag	4.91	3.37	8.27	0	0.43	21.56	Sag	0.02	0.02
B05-K	Sag	3.7	0.76	4.46	0	0.29	14.26	Sag	0.02	0.02
B05-L	B05-J	4.78	0	3.69	1.08	0.2	9.76	0.03	0.02	0.02
B06	Offsite	4.41	0	4.29	0.12	0.27	13.25	0.005	0.02	0.02
B06-A	B06-B	3.99	0	3.92	0.07	0.25	12.46	0.006	0.02	0.02
B06-B	B06-C	3.85	0.07	3.86	0.06	0.25	12.37	0.006	0.02	0.02
B06-C	B06-E	2.56	0.06	2.61	0	0.21	10.63	0.006	0.02	0.02
B06-D	B06-H	3.66	0	3.64	0.02	0.24	12.06	0.006	0.02	0.02
B06-E	B06-F	5.7	0	5.14	0.56	0.28	14.23	0.006	0.02	0.02
B06-F	B06-G	2.85	0.56	3.4	0	0.23	11.74	0.006	0.02	0.02
B06-G	B06-J	5.89	0	5.27	0.63	0.29	14.41	0.006	0.02	0.02
B06-H	B05L	2.88	0.02	2.9	0	0.22	11.05	0.006	0.02	0.02
B06-J	B05L	4.09	0.63	4.48	0.24	0.27	13.26	0.006	0.02	0.02
B07-A	B01-G	2.41	0	2.38	0.03	0.16	8.14	0.02	0.02	0.02
B07-B	B01-G	1.54	0	1.54	0	0.14	6.89	0.02	0.02	0.02

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/7/2024

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-B INLET CALCULATIONS (2 OF 2)

SOMERSET HILLS - PHASES A-E

City of Georgetown
Williamson County, Texas

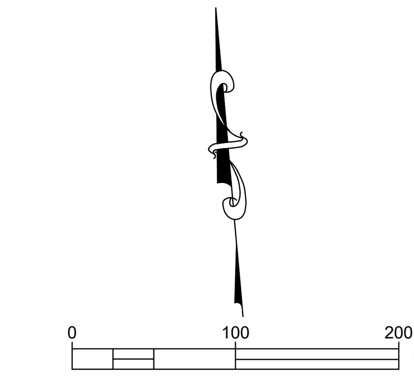
Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.	
Sheet Number:	21 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\21 STRM-B INLET CALCULATIONS (2 OF 2).dwg By: Kevin Langford Date: 5/7/2024 12:35 PM

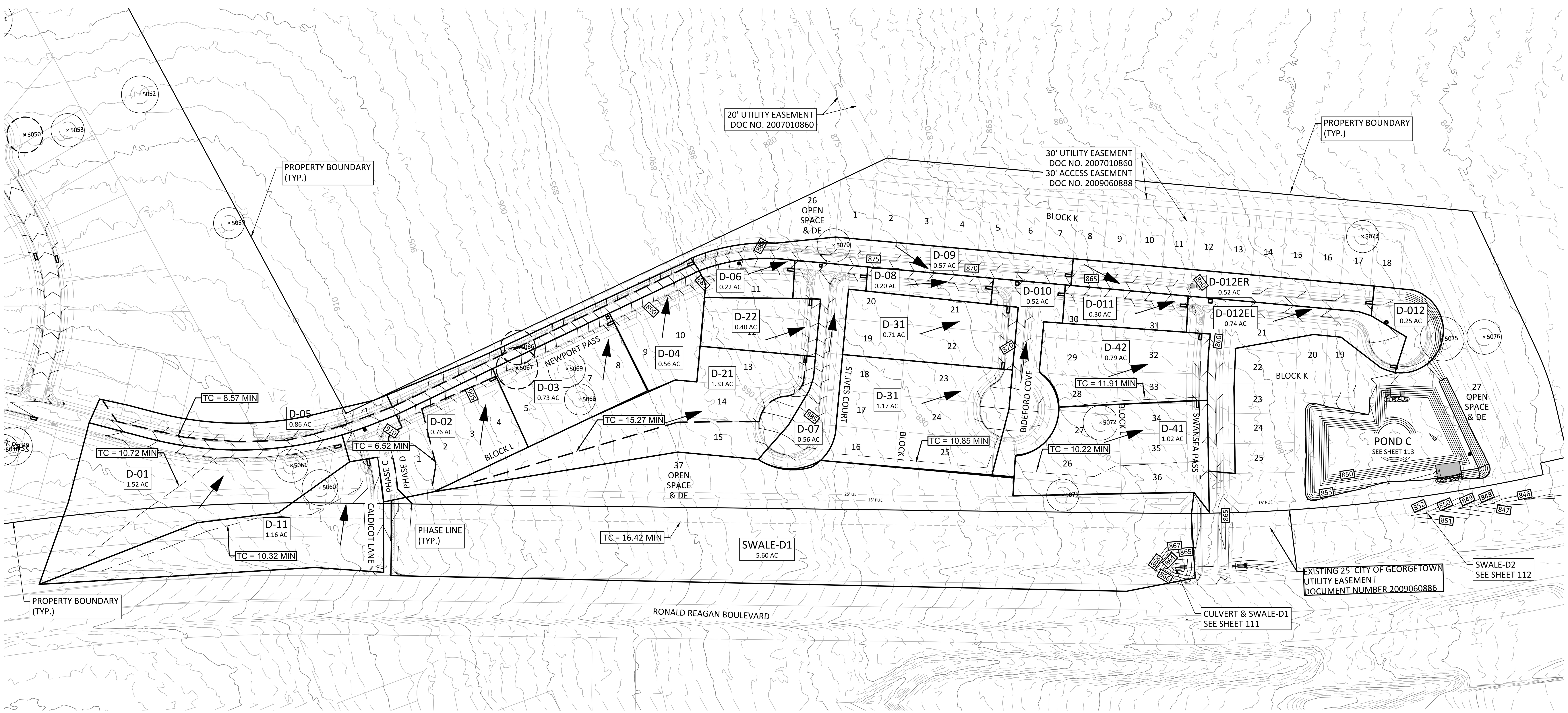
NOTES:

1. ALL SUBBASINS WITH AREAS LESS THAN 0.75 ACRES WERE ASSUMED TO HAVE A TIME OF CONCENTRATION OF 5 MINUTES
2. IMPERVIOUS COVER WAS CALCULATED WITH A WEIGHTED C VALUE WITH LOTS BEING CALCULATED AT 45% IMPERVIOUS COVER
3. A C VALUE OF 0.97 WAS USED FOR ALL IMPERVIOUS COVER
4. A PERVIOUS COVER VALUES WERE DETERMINED BY THE GEORGETOWN DCM TABLE 3-1 WITH THE AREA DETERMINED TO BE GRASS 75%+ COVER WITH 2-7% SLOPES
5. BYPASS FROM SUBBASIN D-09 HAS BEEN ACCOUNTED FOR IN SUBBASIN D-012ER
6. BYPASS FROM SUBBASSINS D-011 AND D-42 HAS BEEN ACCOUNTED FOR IN SUBBASIN D-012EL



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



THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED PROFESSIONAL ENGINEER
11/11/21

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-D INLET CALCULATIONS (1 OF 2)

SOMERSET HILLS PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P\22000-22999 SOMERSET HILLS
Xref DWG FILE.	
Sheet Number:	24 of 218 sheets

2021-21-CON

NOTES:

1. A 5 MINUTE TIME OF CONCENTRATION WAS USED FOR ALL AREAS UNDER 0.75 ACRE.
2. A C VALUE OF 0.97 WAS USED FOR ALL IMPERVIOUS COVER
3. C VALUES WERE DERIVED FROM TABLE 3-1 OF THE GEORGETOWN DCM. LAND COVER WAS ASSUMED TO BE GRASS, 75% COVER WITH 2-7% SLOPES

STRM-D 25 YEAR FLOW TO INLETS

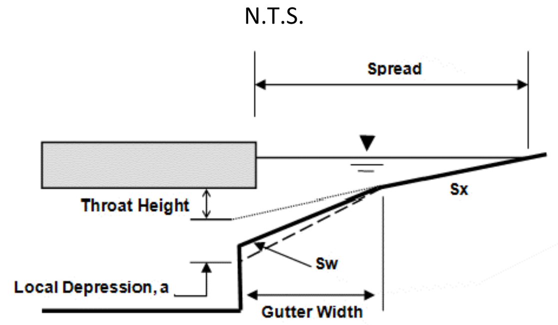
Inlet Number	Qfrom passing + Q25 [cfs]	Street Longitudinal Slope [ft/ft]	Street Cross Slope, Sx [ft/ft]	Ponded Width (T) [ft]	Gutter Flow Depth (y) [ft]	Manning's n	Throat Height [in]	Depression Width (W) [ft]	Inlet Length Design [ft]	Qcarryover [cfs]	Qinlet [cfs]	Bypass Flow [cfs]
D-01	5.6	0.019	0.02	12.40	0.31	0.015	3.8	0.83	10.67	0.00	5.60	0.95
D-02	5.53	0.035	0.02	11.48	0.30	0.015	3.8	0.83	10.67	1.62	5.53	1.74
D-03	5.12	0.05	0.02	10.49	0.28	0.015	3.8	0.83	10.67	1.74	5.12	1.74
D-04	4.26	0.053	0.02	9.18	0.25	0.015	3.8	0.83	10.67	1.74	4.26	0.78
D-05	4.83	0.048	0.02	10.12	0.27	0.015	3.8	0.83	10.67	0.00	4.83	1.28
D-06	2.41	0.024	0.02	8.02	0.23	0.015	3.8	0.83	10.67	0.78	2.41	0.00
D-07	4.23	0.029	0.02	9.91	0.26	0.015	3.8	0.83	10.67	0.08	4.23	0.33
D-08	1.94	0.03	0.02	7.03	0.21	0.015	3.8	0.83	10.67	0.33	1.94	0.00
D-09	5.34	0.03	0.02	11.43	0.30	0.015	3.8	0.83	10.67	2.10	5.34	1.23
D-010	3.84	0.03	0.02	9.41	0.25	0.015	3.8	0.83	10.67	0.00	3.84	0.16
D-011	2.38	0.03	0.02	7.64	0.22	0.015	3.8	0.83	10.67	0.16	2.38	0.00
D-11	5.91	0.012	0.02	13.61	0.34	0.015	3.8	0.83	10.67	0.00	5.91	0.67
D-21	4.78	0.042	0.02	10.20	0.27	0.015	3.8	0.83	10.67	0.00	4.78	1.06
D-22	3.75	0.026	0.02	9.50	0.26	0.015	3.8	0.83	10.67	1.06	3.75	0.08
D-31	5.5	0.027	0.02	11.75	0.30	0.015	3.8	0.83	10.67	0.00	5.50	1.31
D-32	5.33	0.021	0.02	11.90	0.30	0.015	3.8	0.83	10.67	1.31	5.33	0.82
D-41	5.2	0.018	0.02	11.94	0.31	0.015	3.8	0.83	10.67	0.00	5.20	0.59
D-42	4.72	0.018	0.02	11.31	0.29	0.015	3.8	0.83	10.67	0.59	4.72	0.31

STRM-D 100 YEAR FLOW TO INLETS

Inlet Number	Qfrom passing + Q100 [cfs]	Street Longitudinal Slope [ft/ft]	Street Cross Slope, Sx [ft/ft]	Ponded Width (T) [ft]	Gutter Flow Depth (y) [ft]	Manning's n	Throat Height [in]	Depression Width (W) [ft]	Inlet Length Design [ft]	Qcarryover [cfs]	Qinlet [cfs]	Bypass Flow [cfs]
D-01	6.55	0.019	0.02	13.73	0.34	0.015	3.8	0.83	10.67	0.00	6.55	1.97
D-02	6.62	0.035	0.02	13.08	0.33	0.015	3.8	0.83	10.67	3.33	6.62	3.56
D-03	6.16	0.05	0.02	12.04	0.31	0.015	3.8	0.83	10.67	3.56	6.16	3.61
D-04	5.39	0.053	0.02	10.83	0.28	0.015	3.8	0.83	10.67	3.61	5.39	2.27
D-05	5.33	0.048	0.02	10.84	0.28	0.015	3.8	0.83	10.67	0.00	5.33	1.96
D-06	4.05	0.024	0.02	10.02	0.27	0.015	3.8	0.83	10.67	2.27	4.05	0.15
D-07	5.08	0.029	0.02	11.07	0.29	0.015	3.8	0.83	10.67	0.71	5.08	0.97
D-08	2.9	0.03	0.02	8.28	0.23	0.015	3.8	0.83	10.67	0.97	2.90	0.00
D-09	6.41	0.03	0.02	12.97	0.33	0.015	3.8	0.83	10.67	3.71	6.41	2.69
D-010	4.4	0.03	0.02	10.14	0.27	0.015	3.8	0.83	10.67	0.00	4.40	0.43
D-011	3.12	0.03	0.02	8.52	0.24	0.015	3.8	0.83	10.67	0.43	3.12	0.00
D-11	6.76	0.012	0.02	14.76	0.36	0.015	3.8	0.83	10.67	0.00	6.76	1.36
D-21	5.46	0.042	0.02	11.19	0.29	0.015	3.8	0.83	10.67	0.00	5.46	1.92
D-22	4.73	0.026	0.02	10.78	0.28	0.015	3.8	0.83	10.67	1.92	4.73	0.55
D-31	6.14	0.027	0.02	12.67	0.32	0.015	3.8	0.83	10.67	0.00	6.14	2.12
D-32	6.25	0.021	0.02	13.17	0.33	0.015	3.8	0.83	10.67	2.12	6.25	1.75
D-41	5.94	0.018	0.02	12.95	0.33	0.015	3.8	0.83	10.67	0.00	5.94	1.19
D-42	5.66	0.018	0.02	12.56	0.32	0.015	3.8	0.83	10.67	1.19	5.66	0.93

CURB INLET DETAIL

N.T.S.



STRM-D012 25 YEAR FLOW TO INLETS

Inlet Number	Qfrom passing + Q25 [cfs]	Street Longitudinal Slope [ft/ft]	Street Cross Slope, Sx [ft/ft]	Ponded Width (T) [ft]	Gutter Flow Depth (y) [ft]	Manning's n	Throat Height [in]	Depression Width (W) [ft]	Inlet Length Design [ft]	Qcarryover [cfs]	Qinlet [cfs]	Bypass Flow [cfs]
D-012	2.22	Sag	0.02	9.58	0.26	....	3.8	0.83	10.67	0.350	2.220	0.000
D-012EL	6.07	0.005	0.02	15.63	0.38	0.015	3.8	0.83	10.67	0.000	6.070	0.140
D-012ER	5.07	0.011	0.02	12.63	0.32	0.015	3.8	0.83	10.67	0.000	5.070	0.200

STRM-D012 100 YEAR FLOW TO INLETS

Inlet Number	Qfrom passing + Q100 [cfs]	Street Longitudinal Slope [ft/ft]	Street Cross Slope, Sx [ft/ft]	Ponded Width (T) [ft]	Gutter Flow Depth (y) [ft]	Manning's n	Throat Height [in]	Depression Width (W) [ft]	Inlet Length Design [ft]	Qcarryover [cfs]	Qinlet [cfs]	Bypass Flow [cfs]
D-012	4.01	Sag	0.02	14.22	0.35	....	3.8	0.83	10.67	1.75	4.01	0.00
D-012EL	7.36	0.005	0.02	17.25	0.41	0.015	3.8	0.83	10.67	0.00	7.36	0.69
D-012ER	6.51	0.011	0.02	14.51	0.36	0.015	3.8	0.83	10.67	0.00	6.51	1.06

STRM-D 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)	%
D-01	1.519	10.72	5.24	7.13	8.23	10.02	0.43	0.47	0.5	0.56	3.46	5.14	6.24	8.46	0	0%	0.286	19%	1.233	81%
D-02	0.842	6.52	6.09	8.17	9.34	11.31	0.65	0.68	0.69	0.72	3.35	4.66	5.44	6.9	0.245	29%	0.192	23%	0.404	48%
D-03	0.727	5	6.48	8.64	9.84	11.88	0.65	0.67	0.69	0.72	3.04	4.21	4.9	6.22	0.272	37%	0.098	14%	0.357	49%
D-04	0.467	5	6.48	8.64	9.84	11.88	0.65	0.68	0.69	0.73	1.98	2.73	3.18	4.02	0.167	36%	0.076	16%	0.223	48%
D-05	0.857	8.57	5.65	7.62	8.76	10.63	0.75	0.77	0.78	0.8	3.64	5.02	5.85	7.31	0.054	6%	0.52	61%	0.283	33%
D-06	0.215	5	6.48	8.64	9.84	11.88	0.7	0.72	0.74	0.76	0.98	1.34	1.56	1.95	0.055	26%	0.073	34%	0.087	40%
D-07	0.562	5	6.48	8.64	9.84	11.88	0.76	0.77	0.78	0.8	2.75	3.75	4.32	5.37	0.077	14%	0.302	54%	0.182	32%
D-08	0.204	5	6.48	8.64	9.84	11.88	0.74	0.76	0.77	0.8	0.99	1.34	1.55	1.93	0.037	18%	0.097	48%	0.07	34%
D-09	0.574	5	6.48	8.64	9.84	11.88	0.74	0.75	0.76	0.79	2.74	3.74	4.32	5.38	0.079	14%	0.291	51%	0.203	35%
D-010	0.515	5	6.48	8.64	9.84	11.88	0.73	0.75	0.76	0.79	2.45	3.35	3.86	4.82	0.08	16%	0.251	49%	0.184	36%
D-011	0.298	5	6.48	8.64	9.84	11.88	0.7	0.72	0.73	0.76	1.35	1.85	2.14	2.69	0.081	27%	0.095	32%	0.122	41%
D-012	0.251	5	6.48	8.64	9.84	11.88	0.69	0.72	0.73	0.76	1.13	1.55	1.79	2.25	0.009	4%	0.137	55%	0.105	42%
D-012EL	0.741	5	6.48	8.64	9.84	11.88	0.76	0.78	0.78	0.81	3.64	4.96	5.72	7.1	0.126	17%	0.378	51%	0.237	32%
D-012ER	0.524	5	6.48	8.64	9.84	11.88	0.73	0.75	0.76	0.79	2.49	3.41	3.93	4.91	0.103	20%	0.234	45%	0.188	36%
D-11	1.162	10.32	5.31	7.21	8.32	10.13	0.61	0.64	0.65	0.69	3.77	5.35	6.33	8.15	0	0%	0.53	46%	0.632	54%
D-21	1.353	15.27	4.56	6.29	7.31	8.95	0.51	0.54	0.56	0.61	3.13	4.61	5.57	7.41	0.268	20%	0.135	10%	0.951	70%
D-22	0.399	5	6.48	8.64	9.84	11.88	0.64	0.66	0.68	0.71	1.65	2.29	2.66	3.38	0.155	39%	0.044	11%	0.2	50%
D-31	1.166	10.85	5.22	7.1	8.2	9.98	0.64	0.66	0.68	0.71	3.87	5.47	6.46	8.28	0.464	40%	0.11	9%	0.591	51%
D-32	0.707	5	6.48	8.64	9.84	11.88	0.63	0.65	0.67	0.7	2.87	3.99	4.65	5.92	0.291	41%	0.048	7%	0.368	52%
D-41	1.019	10.22	5.33	7.24	8.34	10.15	0.61	0.63	0.65	0.69	3.29	4.67	5.53	7.13	0.377	37%	0.08	8%	0.562	55%
D-42	0.794	11.91	5.05	6.88	7.96	9.71	0.63	0.65	0.67	0.7	2.51	3.56	4.22	5.43	0.328	41%	0.052	7%	0.414	52%

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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 — 05-15-2021
DESIGNED BY: — DATE

SJT, AEC, BLM — 05-15-2021
DRAWN BY: — DATE

05-15-2021
CHECKED BY: — DATE

05-15-2021
APPROVED BY: — DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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-D INLET CALCULATIONS (2 OF 2)

SOMERSET HILLS PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P:\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: P:\22000-22999 SOMERSET HILLS
Xref DWG FILE:

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\25 STRM-D INLET CALCULATIONS (2 OF 2).dwg By: Brandon Montoya Date: 10/29/2021 1:22 PM

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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-E INLET CALCULATIONS (1 OF 2)

SOMERSET HILLS PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P:\22000-22999 SOMERSET HILLS
Xref DWG FILE:	
Sheet Number:	26 of 218 sheets

2021-21-CON

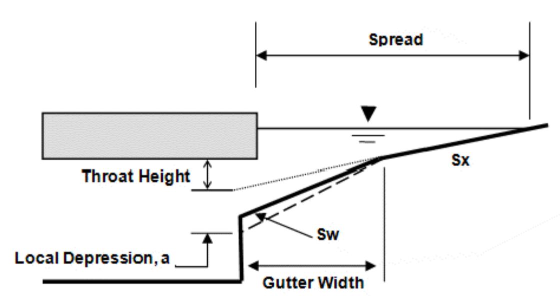
File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\26 STRM-E INLET CALCULATIONS (1 OF 2).dwg By: Brandon Montoya Date: 10/29/2021 1:25 PM

NOTES:

1. A 5 MINUTE TIME OF CONCENTRATION WAS USED FOR ALL AREAS UNDER 1 ACRE.
2. A C VALUE OF 0.97 WAS USED FOR ALL IMPERVIOUS COVER
3. A C VALUE OF 0.46 WAS USED FOR ALL NON-IMPERVIOUS COVER

CURB INLET DETAIL

N.T.S.



STRM-E 25 YEAR FLOW TO INLETS

Inlet Number	Qfrom passing + Q25 [cfs]	Street Longitudinal Slope [ft/ft]	Street Cross Slope, Sx [ft/ft]	Ponded Width (T) [ft]	Gutter Flow Depth (y) [ft]	Manning's n	Throat Height [in]	Depression Width (W) [ft]	Inlet Length Design [ft]	Qcarryover [cfs]	Qinlet [cfs]	Bypass Flow [cfs]
E-01	2.72	Sag	0.02	10.98	0.29	....	3.8	0.83	10.67	0	2.72	0.00
E-01EL	2.63	0.005	0.02	11.3	0.29	0.015	3.8	0.83	10.67	0.00	2.63	0.00
E-01ER	2.56	0.024	0.02	8.22	0.23	0.015	3.8	0.83	10.67	0.00	2.56	0.00
E-02	4.22	0.03	0.02	9.86	0.26	0.015	3.8	0.83	10.67	0.00	4.22	0.35
E-03	4.42	0.02	0.02	10.81	0.28	0.015	3.8	0.83	10.67	0.00	4.42	0.21
E-04	4.27	0.011	0.02	11.8	0.3	0.015	3.8	0.83	10.67	0.62	4.27	0.01
E-05	4.76	0.005	0.02	14.21	0.35	0.015	3.8	0.83	10.67	0.01	4.76	0.00
E-06	4.59	0.005	0.02	14.02	0.35	0.015	3.8	0.83	10.67	0.00	4.59	0.00
E-07	0.85	Sag	0.02	5.04	0.17	....	3.8	0.83	10.67	0.00	0.85	0.00
E-08	6.37	Sag	0.02	19.35	0.45	....	3.8	0.83	10.67	0.21	6.37	0.00
E-21	6.98	0.004	0.02	17.44	0.42	0.015	3.8	0.83	10.67	0.00	6.98	0.27

STRM-E 100 YEAR FLOW TO INLETS

Inlet Number	Qfrom passing + Q100 [cfs]	Street Longitudinal Slope [ft/ft]	Street Cross Slope, Sx [ft/ft]	Ponded Width (T) [ft]	Gutter Flow Depth (y) [ft]	Manning's n	Throat Height [in]	Depression Width (W) [ft]	Inlet Length Design [ft]	Qcarryover [cfs]	Qinlet [cfs]	Bypass Flow [cfs]
E-01	3.66	Sag	0.02	13.36	0.33	....	3.80	0.83	10.67	0.00	3.66	0.00
E-01EL	3.34	0.005	0.02	12.40	0.31	0.02	3.80	0.83	10.67	0.00	3.34	0.00
E-01ER	3.25	0.024	0.02	9.03	0.25	0.02	3.80	0.83	10.67	0.00	3.25	0.00
E-02	4.75	0.03	0.02	10.56	0.28	0.02	3.80	0.83	10.67	0.00	4.75	0.70
E-03	5	0.02	0.02	11.57	0.30	0.02	3.80	0.83	10.67	0.00	5.00	0.51
E-04	5.52	0.011	0.02	13.35	0.33	0.02	3.80	0.83	10.67	1.52	5.52	0.35
E-05	6.06	0.005	0.02	15.72	0.38	0.02	3.80	0.83	10.67	0.35	6.06	0.12
E-06	5.61	0.005	0.02	15.18	0.37	0.02	3.80	0.83	10.67	0.00	5.61	0.04
E-07	1.11	Sag	0.02	6.03	0.19	....	3.80	0.83	10.67	0.04	1.11	0.00
E-08	7.86	Sag	0.02	22.26	0.51	....	3.80	0.83	10.67	0.51	7.86	0.00
E-21	8.14	0.004	0.02	18.90	0.44	0.02	3.80	0.83	10.67	0.00	8.14	0.82

STRM-E 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)	%
E-01	0.592	5	6.48	8.64	9.84	11.88	0.63	0.66	0.67	0.71	2.43	3.37	3.93	4.99	0.225	38%	0.065	11%	0.301	51%
E-01EL	0.476	5	6.48	8.64	9.84	11.88	0.62	0.64	0.66	0.7	1.9	2.64	3.09	3.94	0.099	21%	0.122	26%	0.256	54%
E-01ER	0.448	5	6.48	8.64	9.84	11.88	0.62	0.65	0.66	0.7	1.8	2.51	2.92	3.73	0.079	18%	0.132	29%	0.237	53%
E-02	0.581	5	6.48	8.64	9.84	11.88	0.74	0.76	0.77	0.79	2.8	3.82	4.4	5.48	0.068	12%	0.313	54%	0.2	34%
E-03	0.58	5	6.48	8.64	9.84	11.88	0.75	0.77	0.78	0.8	2.82	3.84	4.43	5.52	0.102	17%	0.285	49%	0.193	33%
E-04	0.452	5	6.48	8.64	9.84	11.88	0.78	0.79	0.8	0.82	2.28	3.1	3.57	4.42	0.071	16%	0.251	55%	0.13	29%
E-05	0.673	5	6.48	8.64	9.84	11.88	0.65	0.68	0.69	0.73	2.85	3.95	4.59	5.81	0.24	36%	0.111	17%	0.321	48%
E-06	0.651	5	6.48	8.64	9.84	11.88	0.65	0.68	0.69	0.73	2.76	3.82	4.44	5.62	0.232	36%	0.108	17%	0.311	48%
E-07	0.148	5	6.48	8.64	9.84	11.88	0.5	0.53	0.56	0.61	0.48	0.68	0.81	1.06	0.002	2%	0.04	27%	0.106	72%
E-07E	0.168	5	6.48	8.64	9.84	11.88	0.73	0.75	0.76	0.78	0.79	1.09	1.26	1.57	0	0%	0.107	63%	0.062	37%
E-08	0.804	5 (2.24)	6.48	8.64	9.84	11.88	0.72	0.73	0.75	0.77	3.73	5.1	5.9	7.39	0.122	15%	0.372	46%	0.31	39%
E-08E	0.189	5	6.48	8.64	9.84	11.88	0.76	0.78	0.79	0.81	0.94	1.27	1.47	1.82	0.011	6%	0.119	63%	0.059	31%
E-21	1.226	8.2	5.72	7.72	8.86	10.75	0.59	0.62	0.64	0.68	4.14	5.86	6.91	8.92	0.36	29%	0.161	13%	0.705	57%

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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 — 05-15-2021
DESIGNED BY: — DATE

SJT, AEC, BLM — 05-15-2021
DRAWN BY: — DATE

05-15-2021
CHECKED BY: — DATE

05-15-2021
APPROVED BY: — DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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-E INLET CALCULATIONS (2 OF 2)

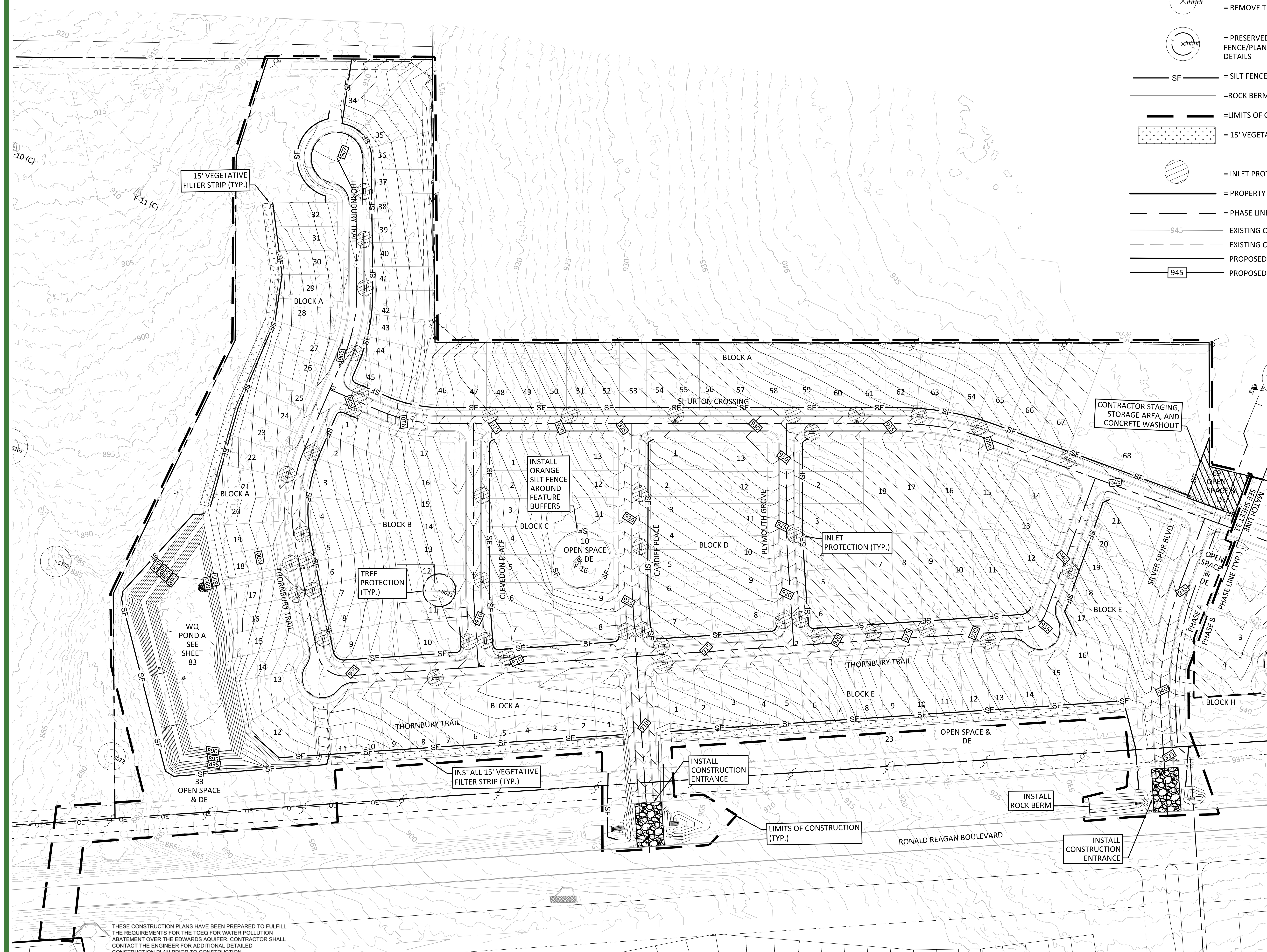
SOMERSET HILLS PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: P\22000-22999 SOMERSET HILLS
Xref DWG FILE.

File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\27 STRM-E INLET CALCULATIONS (2 OF 2).dwg By: Brandon Montoya Date: 10/29/2021 1:25 PM

3



LEGEND

- = REMOVE TREE
- = PRESERVED/PROTECTED TREE ADD FENCE/PLANK PROTECTION PER DETAILS
- SF = SILT FENCE
- =ROCK BERM
- =LIMITS OF CONSTRUCTION
- = 15' VEGETATIVE FILTER STRIP
- = INLET PROTECTION
- = PROPERTY BOUNDARY
- = PHASE LINE
- 945 EXISTING CONTOURS (MAJOR)
- EXISTING CONTOURS (MINOR)
- PROPOSED CONTOURS (MAJOR)
- 945 PROPOSED CONTOURS (MINOR)

0 100 200 Feet

TREE PROTECTION NOTES:

1. Existing trees to remain shall be flagged by contractor prior to beginning any work on site.
2. Contractor shall place a minimum 4' height protective fencing 5' outside the edge of canopy of all trees to remain and as shown on the tree protection and removal plans.
3. All understory trees, undergrowth, shrubs, cacti and native grasses shall remain in areas protected by tree protection fence unless noted otherwise on the landscape plans.
4. Contractor shall maintain flagging and protective fencing around existing trees to remain at least until substantial completion.
5. Contractor shall ensure that no dumping of backfill, soil excavation, staking or storage of materials or dumping of any kind shall occur within the fenced area of the trees to remain.
6. Contractor shall ensure that no parking of any type of vehicle, equipment or construction trailer shall occur within the fenced area of trees to remain.
7. Contractor shall ensure that no driving of vehicles shall occur within the fenced area of trees to remain.
8. Contractor shall ensure that no grade changes shall occur within the canopy of the existing trees to remain.
9. Contractor shall keep fenced areas of trees to remain free of trash, debris or excessive runoff.
10. No trenching for utilities or irrigation shall occur within the dripline (canopy) of existing trees to remain.
11. For irrigation, any lateral line or mainline trenches which encroach in the dripline of existing trees shall be hand dug.
12. For utilities, any lines which cannot be altered to fall outside the canopy of existing trees shall be installed by boring a minimum of 24" below grade.

NOTES:

1. Topography based upon LIDAR aerial mapping, date April 23, 2019 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.
5. Contractor shall maintain all temporary erosion and sediment controls in accordance with local, state and federal regulations.
6. Contractor shall place rock filter dams at the locations where concentrated flow enters and exits the limits of construction.
7. Contractor shall place construction entrance at the location determined by the owner in the field.
8. Curb inlet protection is required at inlets installed with this project. Protection to remain in place until the project is accepted.
9. Perimeter silt fence shall be installed prior to start of construction. Interior silt fence shall be implemented following the completion of lot grading.
10. All storm inlets will have inlet protection installed.
11. All heritage trees will have tree protection installed.
12. See 24 inch Water Plan & profile sheets 134-138 for erosion and sedimentation control measures.

HERITAGE TREE SCHEDULE:

5023 30" LIVE OAK MULTI

HERITAGE TREE MITIGATION

REMOVAL INCHES PHASE A	0
REMOVAL INCHES PHASE B	146
REMOVAL INCHES PHASE D	64
REMOVAL INCHES PHASE E	142
REMOVAL INCHES TOTAL	352"

PROPOSED TREE MITIGATION:
FEE IN LIEU @ 200/IN : $70,400

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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

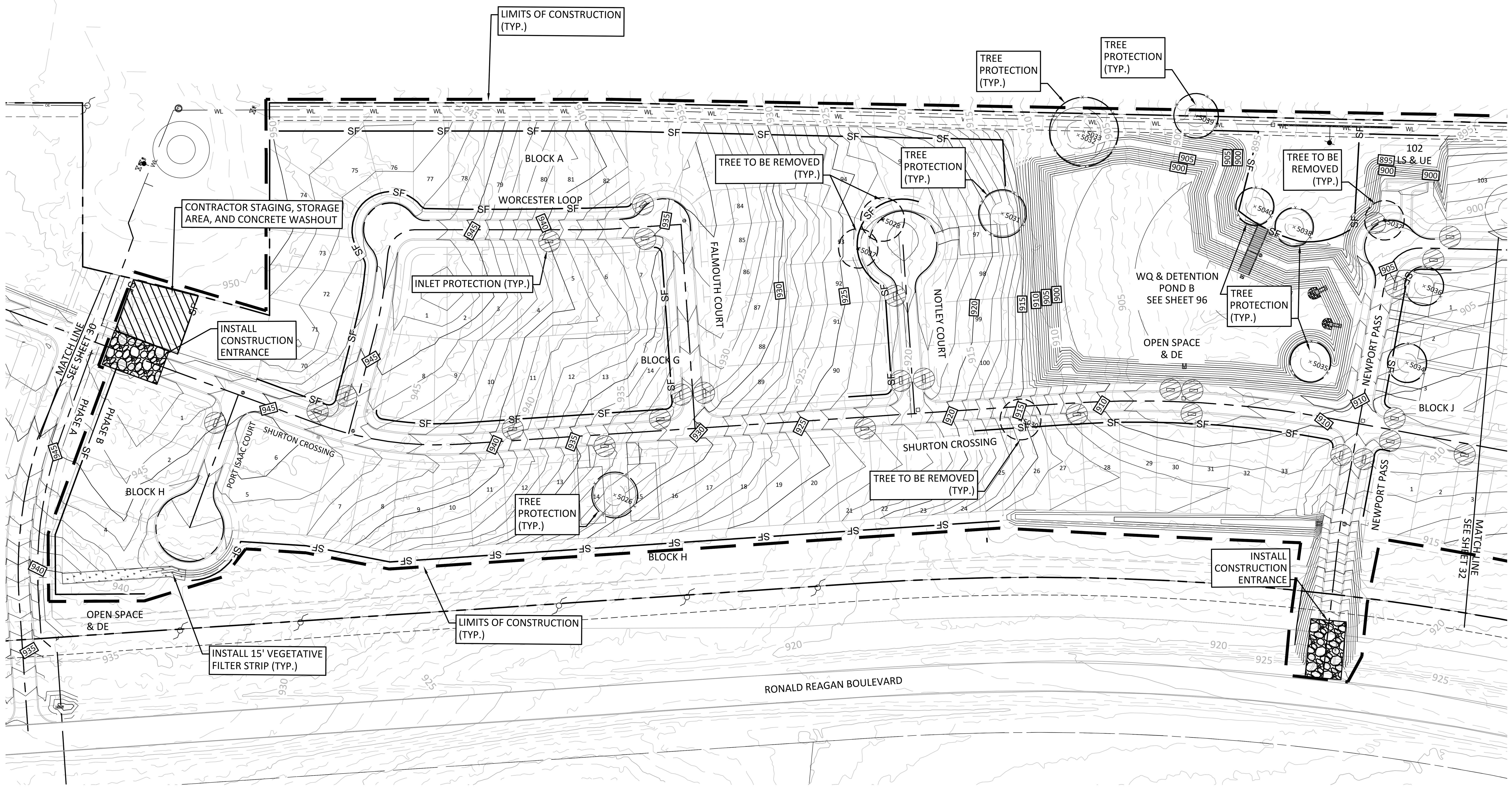
PHASE A EROSION & SEDIMENTATION CONTROL PLAN

SOMERSET HILLS - PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	30 of 218 sheets

2024-XX-CON



HERITAGE TREE SCHEDULE:

5026	30" LIVE OAK	*5037	28" LIVE OAK
*5027	28" LIVE OAK	5038	26" LIVE OAK
*5028	31" LIVE OAK MULTI	5039	31" LIVE OAK
*5030	29" LIVE OAK	5040	26" LIVE OAK
5031	32" LIVE OAK		
5032	39" LIVE OAK		
5033	48" LIVE OAK		
5034	27" LIVE OAK		
5035	28" LIVE OAK MULTI		
5036	27" LIVE OAK		

*TREES TO BE REMOVED

LEGEND

- = REMOVE TREE
- = PRESERVED/PROTECTED TREE ADD FENCE/PLANK PROTECTION PER DETAILS
- SF = SILT FENCE
- =ROCK BERM
- =LIMITS OF CONSTRUCTION
- = 15' VEGETATIVE FILTER STRIP
- = INLET PROTECTION
- = PROPERTY BOUNDARY
- = PHASE LINE
- 945 EXISTING CONTOURS (MAJOR)
- EXISTING CONTOURS (MINOR)
- PROPOSED CONTOURS (MAJOR)
- 945 PROPOSED CONTOURS (MINOR)

TREE PROTECTION NOTES:

1. See Sheet 30 for Tree Protection Notes

HERITAGE TREE MITIGATION

REMOVAL INCHES PHASE A	0
REMOVAL INCHES PHASE B	146
REMOVAL INCHES PHASE D	64
REMOVAL INCHES PHASE E	142
REMOVAL INCHES TOTAL	352"

PROPOSED TREE MITIGATION:
FEE IN LIEU @ 200/IN : $70,400

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/7/2024

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

PHASE B EROSION & SEDIMENTATION CONTROL PLAN (1 OF 2)

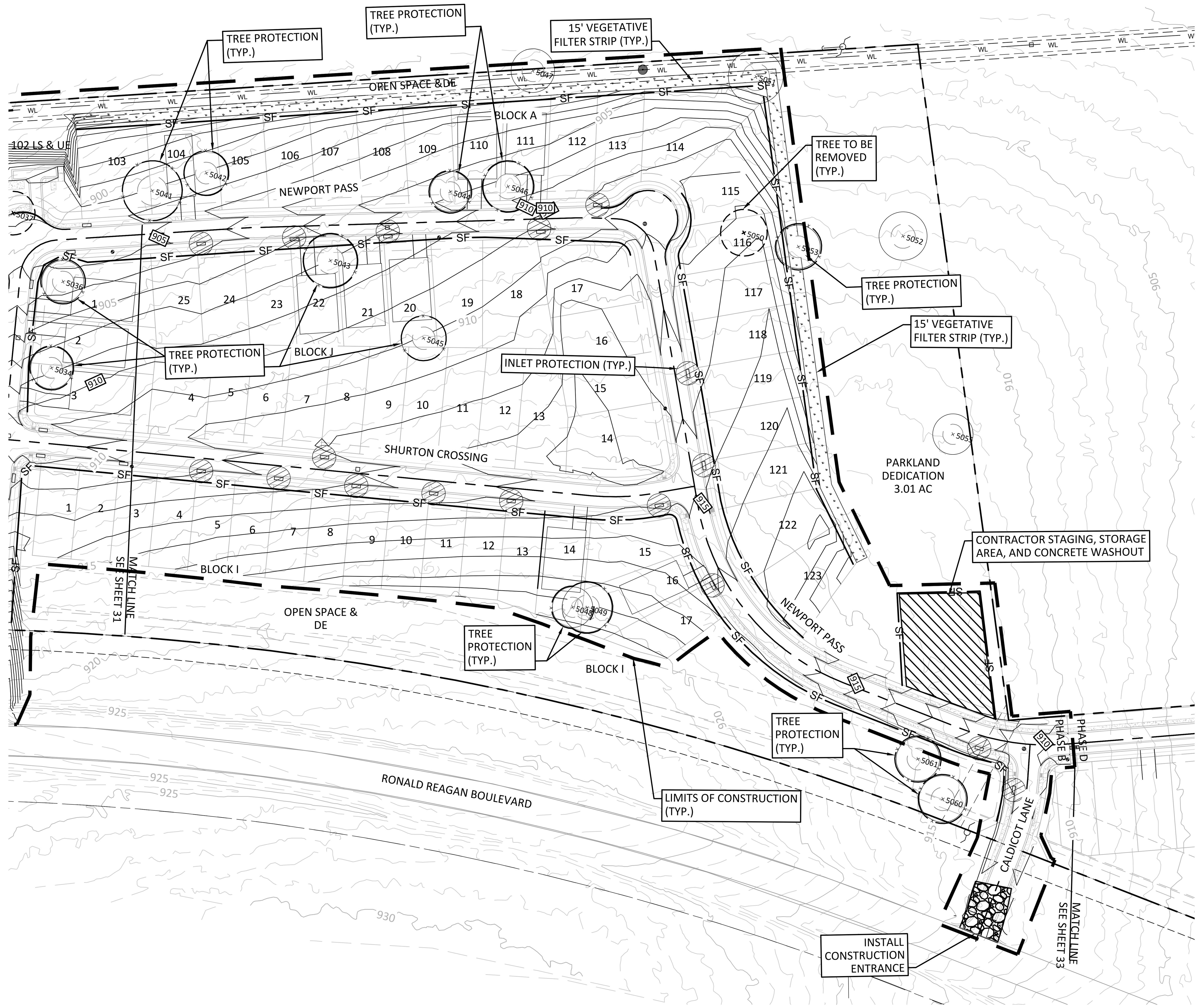
SOMERSET HILLS - PHASES A-E

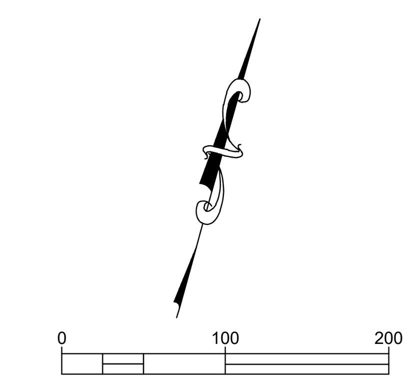
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	31 of 218 sheets

2024-XX-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\31 PHASE B EROSION & SEDIMENTATION CONTROL PLAN (1 OF 2).dwg By: Kevin Langford Date: 5/6/2024 2:43 PM





HERITAGE TREE SCHEDULE:

5041	38" LIVE OAK MULTI	5051	35" LIVE OAK MULTI
5042	28" LIVE OAK	5052	31" LIVE OAK MULTI
5043	34" LIVE OAK	5053	28" POST OAK MULTI
5044	26" LIVE OAK	5055	26" POST OAK MULTI
5045	29" LIVE OAK MULTI	5060	30" LIVE OAK
5046	32" LIVE OAK	5061	28" LIVE OAK
5047	28" LIVE OAK		
5048	26" LIVE OAK		
5049	32" POST OAK		
*5050	30" ELM MULTI		

*TREES TO BE REMOVED

LEGEND

- ×#### = REMOVE TREE
- ×#### = PRESERVED/PROTECTED TREE ADD FENCE/PLANK PROTECTION PER DETAILS
- SF = SILT FENCE
- =ROCK BERM
- =LIMITS OF CONSTRUCTION
- = 15' VEGETATIVE FILTER STRIP
- = INLET PROTECTION
- = PROPERTY BOUNDARY
- = PHASE LINE
- 945 EXISTING CONTOURS (MAJOR)
- EXISTING CONTOURS (MINOR)
- PROPOSED CONTOURS (MAJOR)
- 945 PROPOSED CONTOURS (MINOR)

TREE PROTECTION NOTES:

1. See Sheet 30 for Tree Protection Notes

HERITAGE TREE MITIGATION

REMOVAL INCHES PHASE A	0
REMOVAL INCHES PHASE B	146
REMOVAL INCHES PHASE D	64
REMOVAL INCHES PHASE E	142
REMOVAL INCHES TOTAL	352"

PROPOSED TREE MITIGATION:

FEE IN LIEU @ 200/IN : $70,400

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

PHASE B EROSION & SEDIMENTATION CONTROL PLAN (2 OF 2)

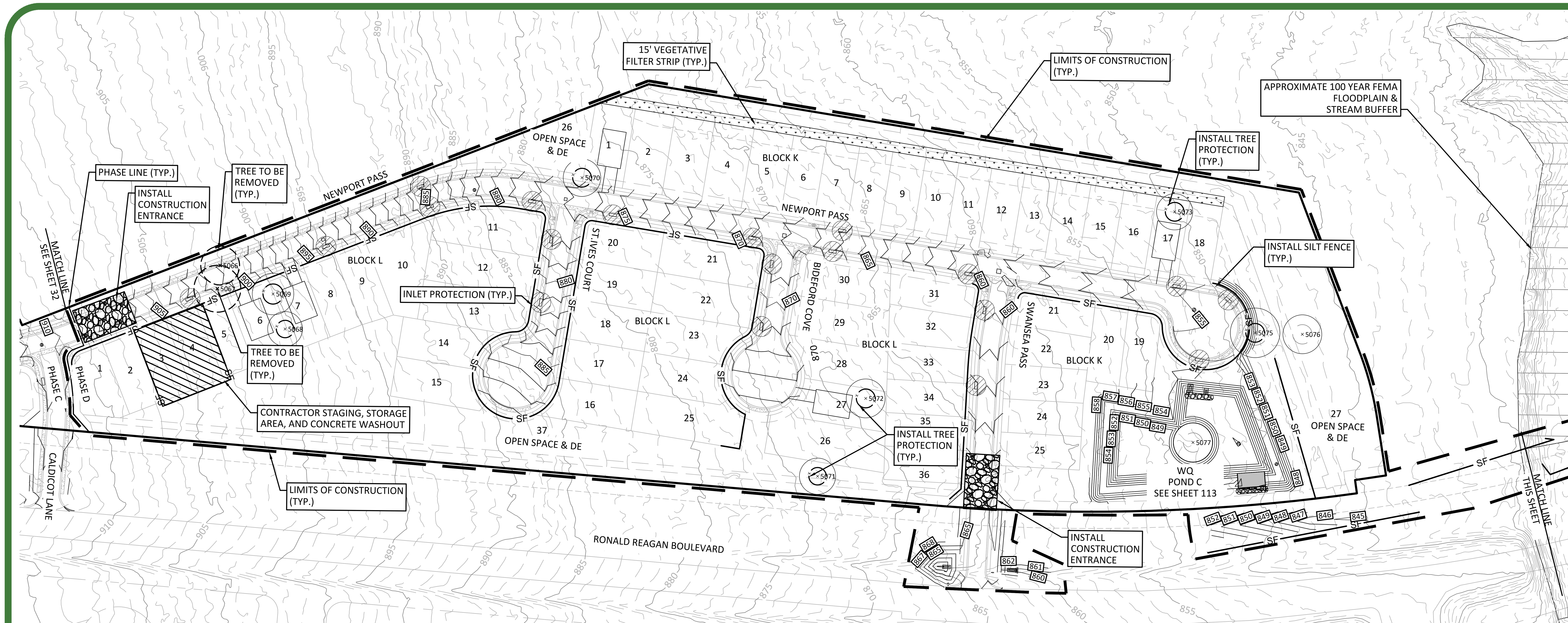
SOMERSET HILLS - PHASES A-E

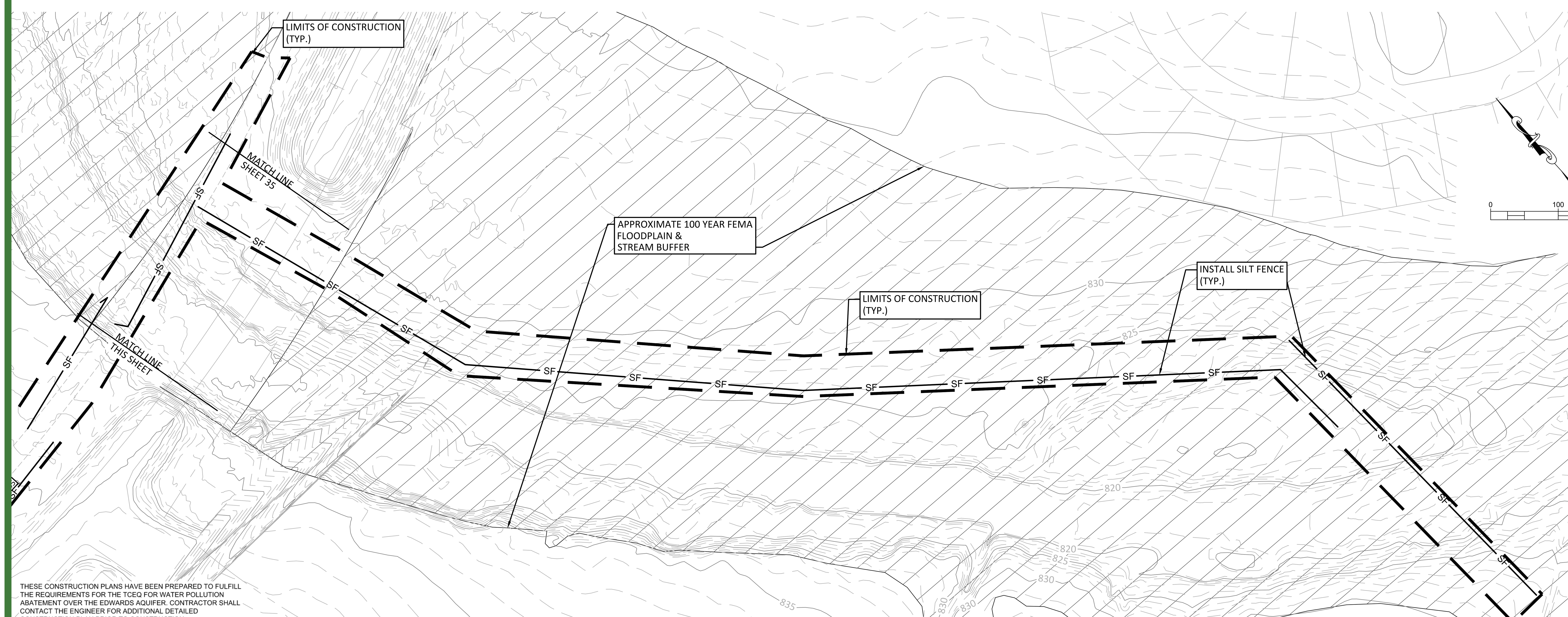
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.	
Sheet Number:	32 of 218 sheets

2024-XX-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\32 PHASE B EROSION & SEDIMENTATION CONTROL PLAN (2 OF 2).dwg By: Kevin Langford Date: 5/6/2024 2:46 PM





HERITAGE TREE SCHEDULE:

*5066	29" LIVE OAK	
*5067	35" LIVE OAK	
5068	26" LIVE OAK MULTI	
5069	31" LIVE OAK	
5070	28" LIVE OAK	
5071	27" LIVE OAK	
5072	29" LIVE OAK MULTI	
5073	27" LIVE OAK	
5075	37" LIVE OAK MULTI	
5076	29" LIVE OAK	
5077	29" LIVE OAK MULTI	

TREES TO BE REMOVED

LEGEND

= REMOVE TREE

= PRESERVED/PROTECTED TREE ADD FENCE/PLANK PROTECTION PER DETAILS

= SILT FENCE

=ROCK BERM

=LIMITS OF CONSTRUCTION

= 15' VEGETATIVE FILTER STRIP

= INLET PROTECTION

= PROPERTY BOUNDARY

= PHASE LINE

TREE PROTECTION NOTES:

1. See Sheet 30 for Tree Protection Notes

HERITAGE TREE MITIGATION

REMOVAL INCHES PHASE A	0
REMOVAL INCHES PHASE B	116
REMOVAL INCHES PHASE C	30
REMOVAL INCHES PHASE D	64
REMOVAL INCHES PHASE E	142
REMOVAL INCHES TOTAL	352"

PROPOSED TREE MITIGATION:

FEE IN LOU: $65,120

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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: — 05-15-2021 DATE
SJT, AEC, BLM — DRAWN BY: — 05-15-2021 DATE
CHECKED BY: — 05-15-2021 DATE
APPROVED BY: — 05-15-2021 DATE

STATE OF TEXAS — BRYAN ERIC MOORE — 98920 — LICENSED PROFESSIONAL ENGINEER — 11/11/21

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

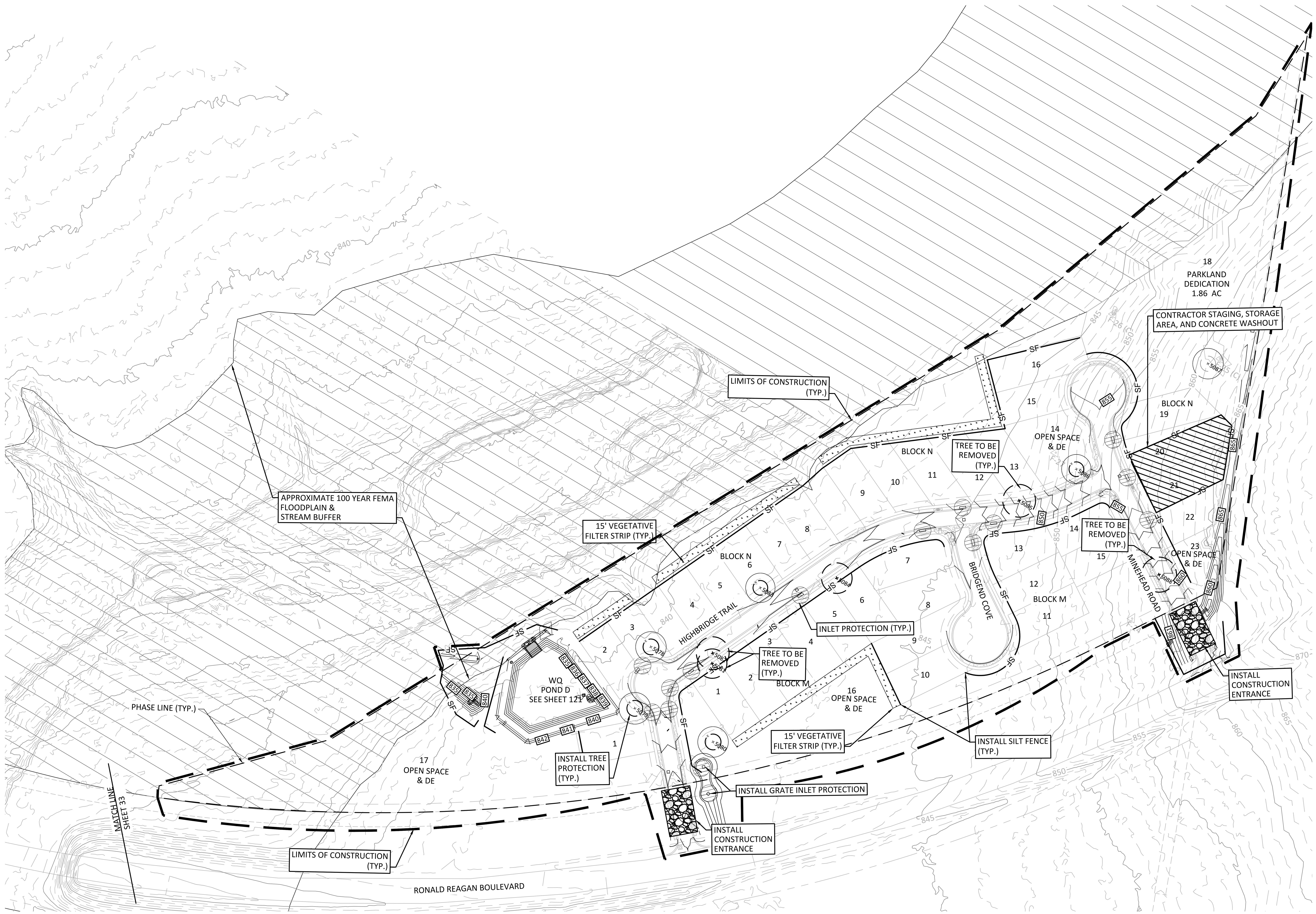
PHASE D EROSION & SEDIMENTATION CONTROL PLAN

SOMERSET HILLS PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P:\22000-22999 SOMERSET HILLS
Xref DWG FILE:	
Sheet Number:	33 of 218 sheets

2021-21-CON



0 100 200 Feet

HERITAGE TREE SCHEDULE:

5078	27" LIVE OAK MULTI
5079	28" LIVE OAK
5080	27" LIVE OAK
*5081	26" LIVE OAK MULTI
*5082	29" LIVE OAK MULTI
5083	26" LIVE OAK MULTI
*5084	27" LIVE OAK
*5085	29" LIVE OAK MULTI
5086	26" LIVE OAK MULTI
5087	27" LIVE OAK MULTI
*5088	31" LIVE OAK MULTI

TREES TO BE REMOVED

LEGEND

- = REMOVE TREE
- = PRESERVED/PROTECTED TREE ADD FENCE/PLANK PROTECTION PER DETAILS
- SF = SILT FENCE
- =ROCK BERM
- =LIMITS OF CONSTRUCTION
- = 15' VEGETATIVE FILTER STRIP
- = INLET PROTECTION
- = PROPERTY BOUNDARY

TREE PROTECTION NOTES:

1. See Sheet 30 for Tree Protection Notes

HERITAGE TREE MITIGATION

REMOVAL INCHES PHASE A	0
REMOVAL INCHES PHASE B	116
REMOVAL INCHES PHASE C	30
REMOVAL INCHES PHASE D	64
REMOVAL INCHES PHASE E	142
REMOVAL INCHES TOTAL	352"

PROPOSED TREE MITIGATION:
FEE IN LOU: $65,120

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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:	05-15-2021 DATE
SJT, AEC, BLM DRAWN BY:	05-15-2021 DATE
CHECKED BY:	05-15-2021 DATE
APPROVED BY:	05-15-2021 DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED PROFESSIONAL ENGINEER
11/11/21

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

PHASE E EROSION & SEDIMENTATION CONTROL PLAN

SOMERSET HILLS PHASES A-E

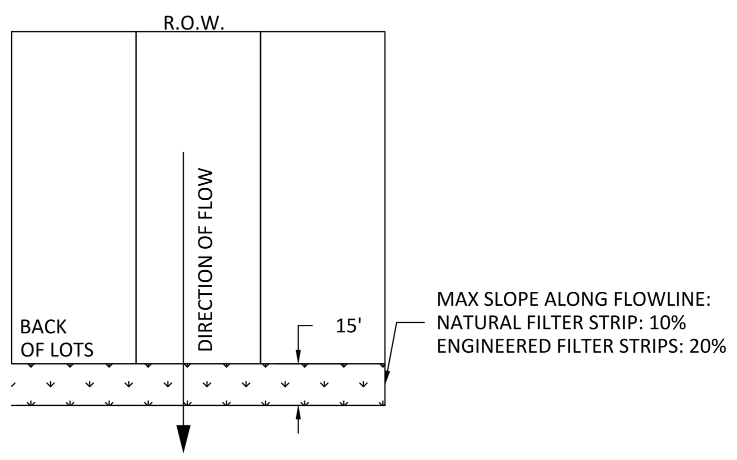
City of Georgetown
Williamson County, Texas

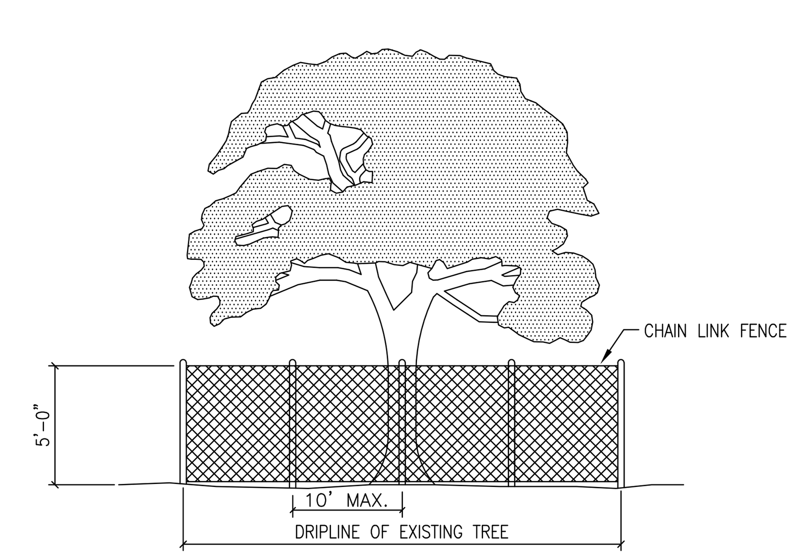
Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P:\22000-22999 SOMERSET HILLS
Xref DWG FILE:	
Sheet Number:	34 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\34 PHASE E EROSION & SEDIMENTATION CONTROL PLAN.dwg By: Brandon Montoya Date: 10/29/2021 1:45 PM

TYPICAL VEGETATIVE FILTER STRIP





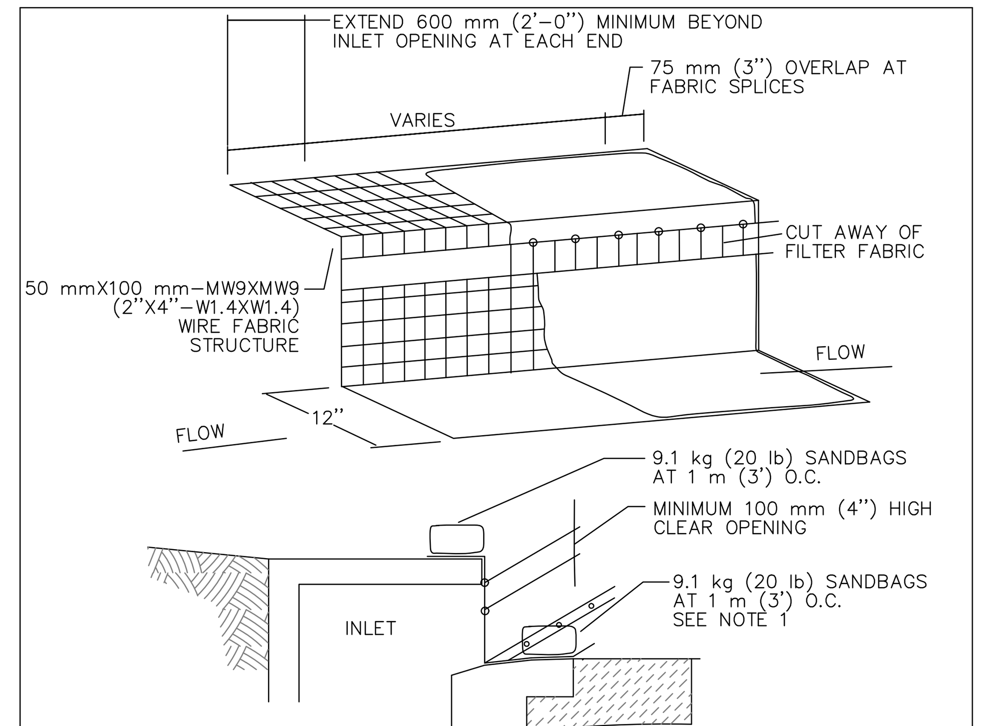
NOTES:

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.

REVISION NOTE: ADOPTED 6/21/2006

GEORGETOWN TEXAS — CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS — TREE PROTECTION – CHAIN LINK FENCE — DRAWING NAME: EC09 — SCALE: NTS — DATE: 1/2003 — DRAWN BY: MRS — APPROVED BY: TRB

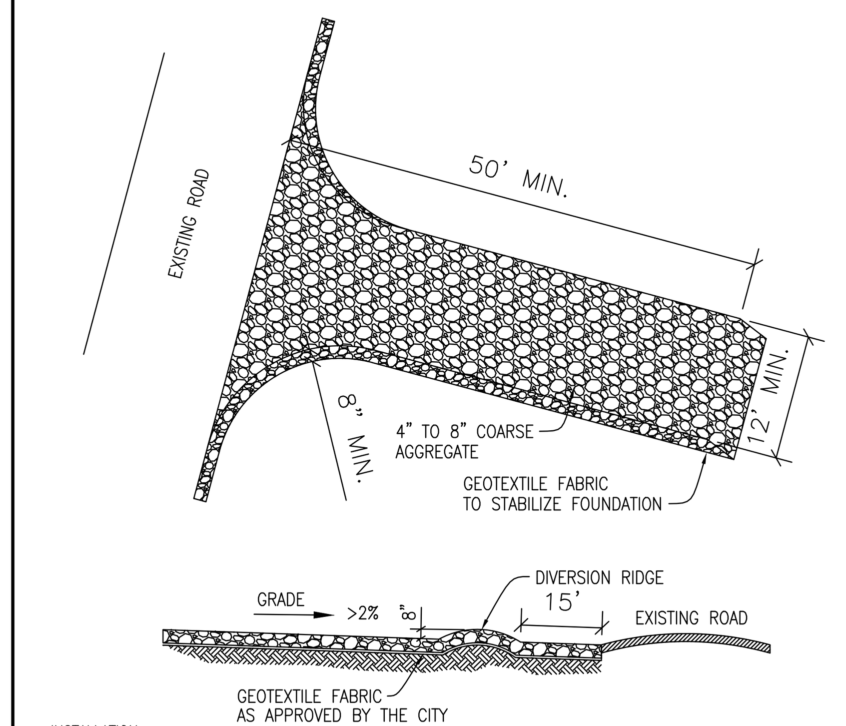


NOTES:

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 SUBSITIUTE 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 STABILZED.

DEPARTMENT OF WATERSHED PROTECTION AND DEVELOPMENT REVIEW — FILTER DIKE CURB INLET PROTECTION

RECORD COPY SIGNED BY HENRY CASAS — 1/2/07 ADOPTED — THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. — STANDARD NO. 628S-2



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.

REVISION NOTE: ADOPTED 6/21/2006

GEORGETOWN TEXAS — CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS — STABILIZED CONSTRUCTION ENTRANCE — DRAWING NAME: EC06 — SCALE: NTS — DATE: 1/2003 — DRAWN BY: MRS — APPROVED BY: TRB

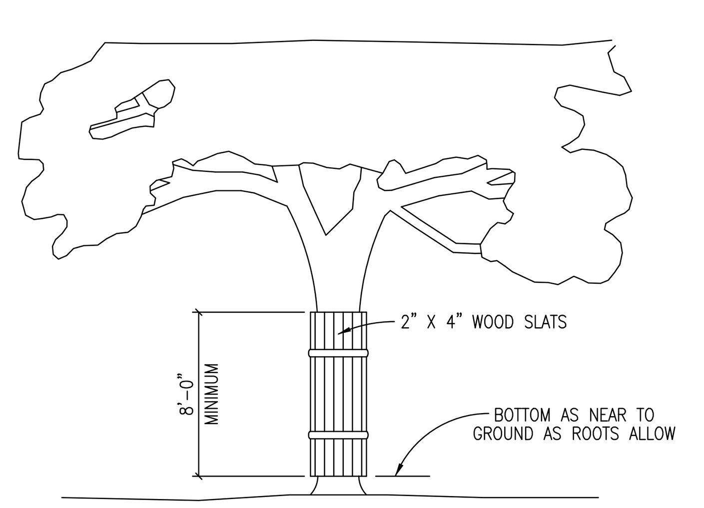
NOTE: THIS SECTION IS INTENDED TO ASSIST THOSE PERSONS PREPARING WATER POLLUTION ABATEMENT PLANS (WPAP) OR STORM WATER POLLUTION PREVENTION PLANS (SW3P) THAT COMPLY WITH FEDERAL, STATE AND/OR LOCAL STORM WATER REGULATIONS.

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 82% 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.

REVISION NOTE: ADOPTED 6/21/2006

GEORGETOWN TEXAS — CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS — EROSION AND SEDIMENTATION AND TREE PROTECTION NOTES — DRAWING NAME: EC01A — SCALE: NTS — DATE: 1/2003 — DRAWN BY: MRS — APPROVED BY: TRB



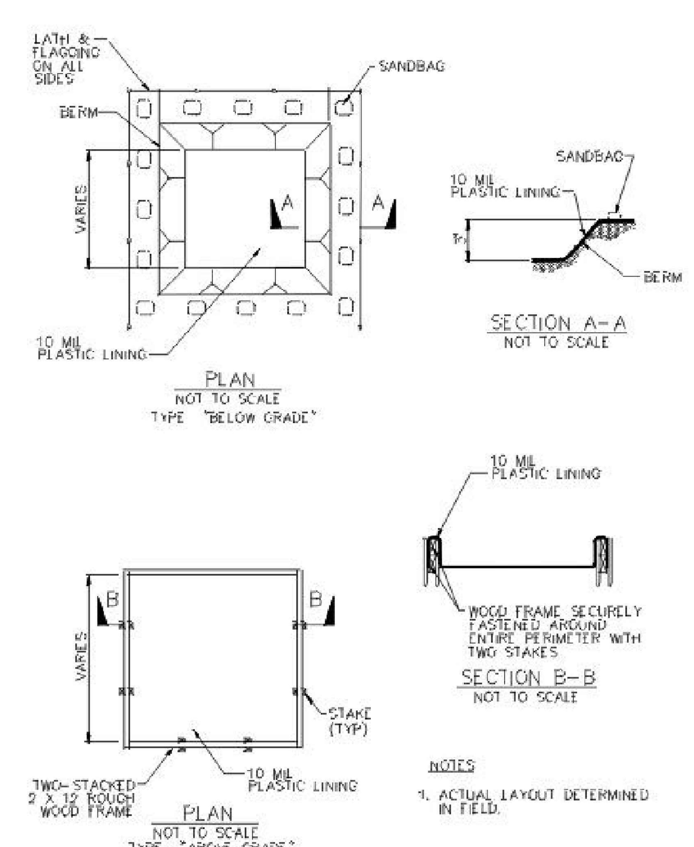
NOTES:

1. WHERE ANY EXCEPTIONS RESULT IN A FENCE BEING CLOSER THAN FOUR FEET (4'-0") TO A TREE TRUNK; PROTECT THE TRUNK WITH STRAPPED-ON-PLANKING TO A HEIGHT OF EIGHT FEET (8'-0"), OR TO THE LIMITS OF LOWER BRANCHING IN ADDITION TO THE REDUCED FENCING PROVIDED.
2. ANY ROOTS EXPOSED BY CONSTRUCTION ACTIVITY SHALL BE PRUNED FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOP SOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN TWO (2) DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE, AND MINIMIZES WATER LOSS DUE TO EVAPORATION.
3. PRIOR EXCAVATION OR GRADE CUTTING WITHIN TREE DRIPLINE. MAKE A CLEAN CUT BETWEEN THE DISTURBED AND UNDISTURBED ROOT ZONES WITH A ROCK SAW OR SIMILAR EQUIPMENT, TO MINIMIZE DAMAGE TO REMAINING ROOTS.
4. TREES MOST HEAVILY IMPACTED BY CONSTRUCTION ACTIVITIES SHOULD BE WATERED DEEPLY ONCE A WEEK DURING PERIODS OF HOT, DRY WEATHER. TREE CROWNS SHOULD BE SPRAYED WITH WATER PERIODICALLY TO REDUCE DUST ACCUMULATION ON THE LEAVES.
5. ANY TRENCHING REQUIRED FOR THE INSTALLATION OF LANDSCAPE IRRIGATION SHALL BE PLACED AS FAR FROM EXISTING TREE TRUNKS AS POSSIBLE.
6. NO LANDSCAPE TOPSOIL DRESSING GREATER THE FOUR INCHES (4") SHALL BE PERMITTED WITHIN THE DRIPLINE OF A TREE. NO SOIL IS PERMITTED ON THE ROOT FLARE OF ANY TREE.
7. PRUNING TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC AND EQUIPMENT SHALL TAKE PLACE BEFORE CONSTRUCTION BEGINS.

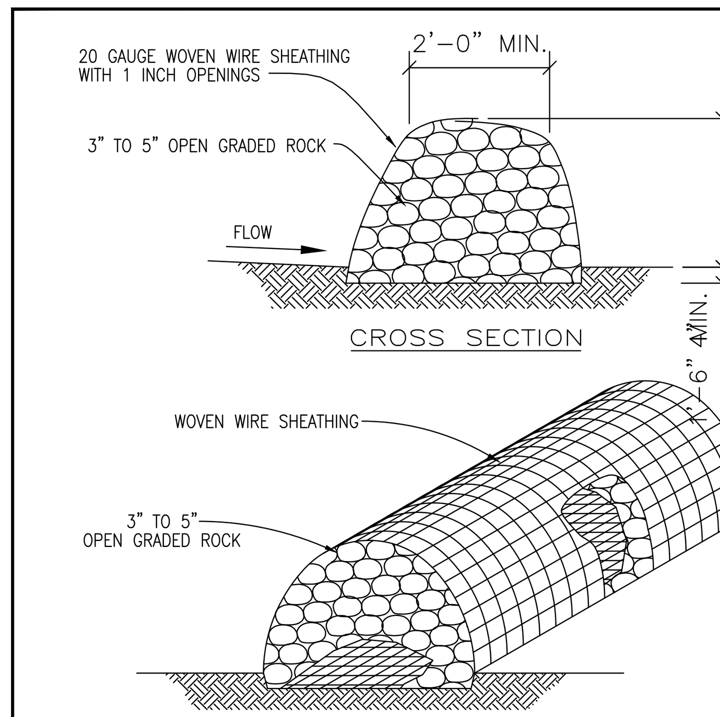
The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

GEORGETOWN TEXAS — CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS — TREE PROTECTION – WOOD SLATS — DRAWING NAME: EC10 — SCALE: NTS — DATE: 1/2003 — DRAWN BY: MRS — APPROVED BY: TRB



Temporary Concrete Washout Area Detail



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.
- REPAIR 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.

REVISION NOTE: ADOPTED 6/21/2006

GEORGETOWN TEXAS — CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS — ROCK BERM DETAIL — DRAWING NAME: EC03 — SCALE: NTS — DATE: 1/2003 — DRAWN BY: MRS — APPROVED BY: 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.

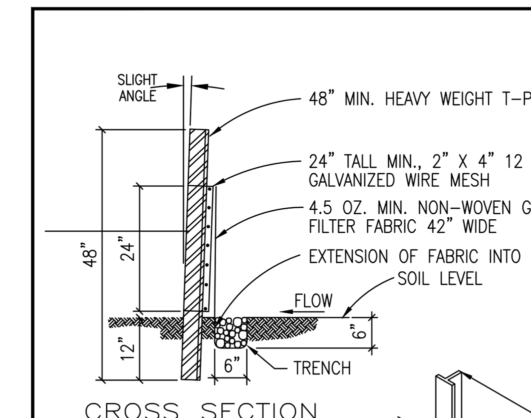
** HIGH SERVICE ROCK BERMS MAY BE REQUIRED IN AREAS OF ENVIRONMENTAL SIGNIFICANCE AS DETERMINED BY THE CITY OF GEORGETOWN.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

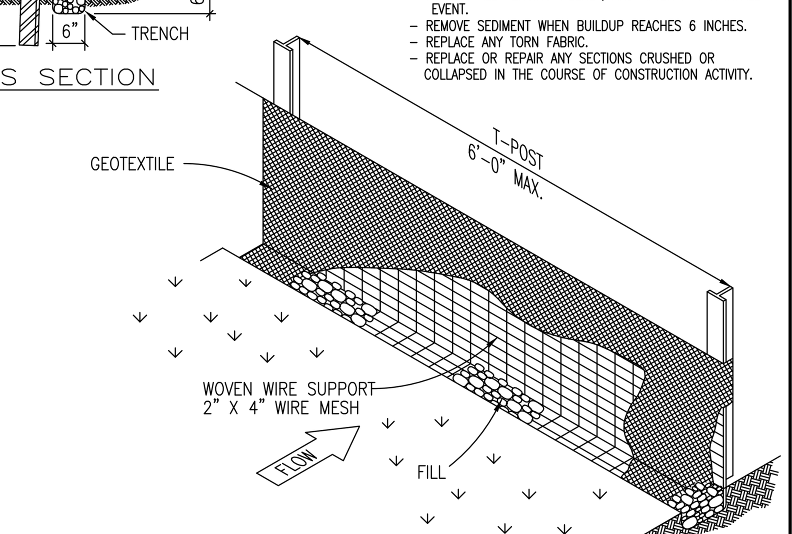
GEORGETOWN TEXAS — CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS — TEMPORARY EROSION AND SEDIMENTATION CONTROL GUIDELINES — DRAWING NAME: EC01 — SCALE: NTS — DATE: 1/2003 — DRAWN BY: MRS — APPROVED BY: TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.



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 CONCENTRATED 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.

REVISION NOTE: ADOPTED 6/21/2006

GEORGETOWN TEXAS — CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS — SILT FENCE DETAIL — DRAWING NAME: EC02 — SCALE: NTS — DATE: 1/2003 — DRAWN BY: MRS — APPROVED BY: TRB

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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 — 05-15-2021 — DESIGNED BY: DATE
SJT, AEC, BLM — 05-15-2021 — DRAWN BY: DATE
05-15-2021 — CHECKED BY: DATE
05-15-2021 — APPROVED BY: DATE

STATE OF TEXAS — BRYAN ERIC MOORE — 98920 — LICENSED PROFESSIONAL ENGINEER — 11/11/21

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

EROSION & SEDIMENTATION CONTROL DETAILS

SOMERSET HILLS PHASES A-E

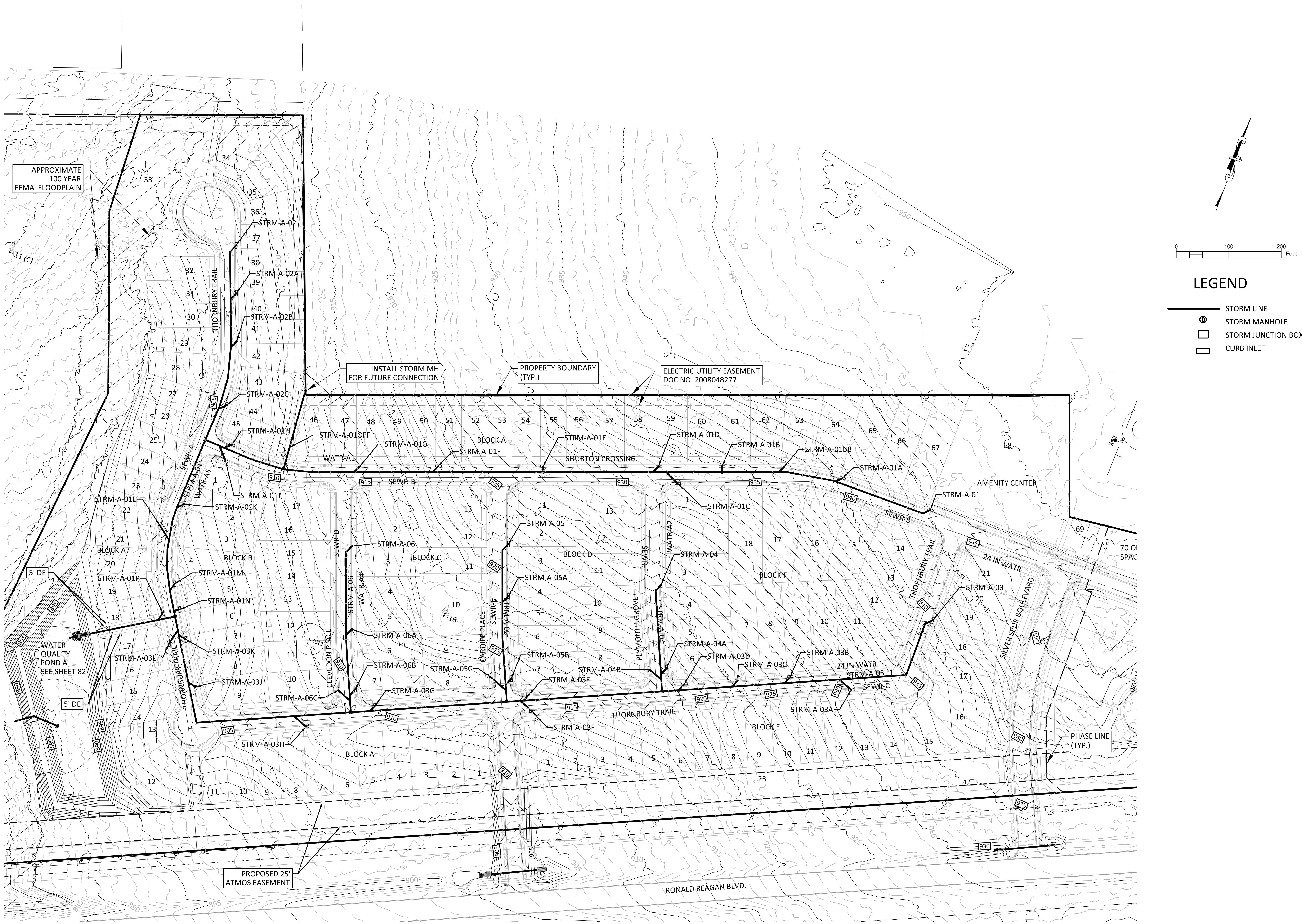
City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P:\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: P:\22000-22999 SOMERSET HILLS
Xref DWG FILE:
Sheet Number: 35 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\35 EROSION & SEDIMENTATION CONTROL DETAILS.dwg By: Brandon Montoya Date: 10/29/2021 1:45 PM

3



THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

	DATE
TLH, CL, EJH, TG	03-15-2024
DESIGNED BY: TEH, TG, CL, EJH	03-15-2024
DRAWN BY: TLH	03-15-2024
CHECKED BY: TLH	03-15-2024
APPROVED BY:	

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

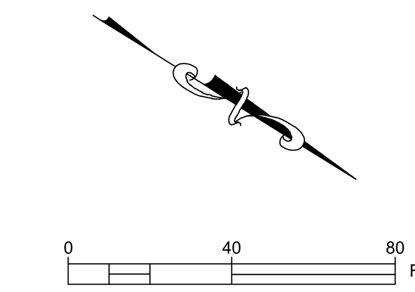
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

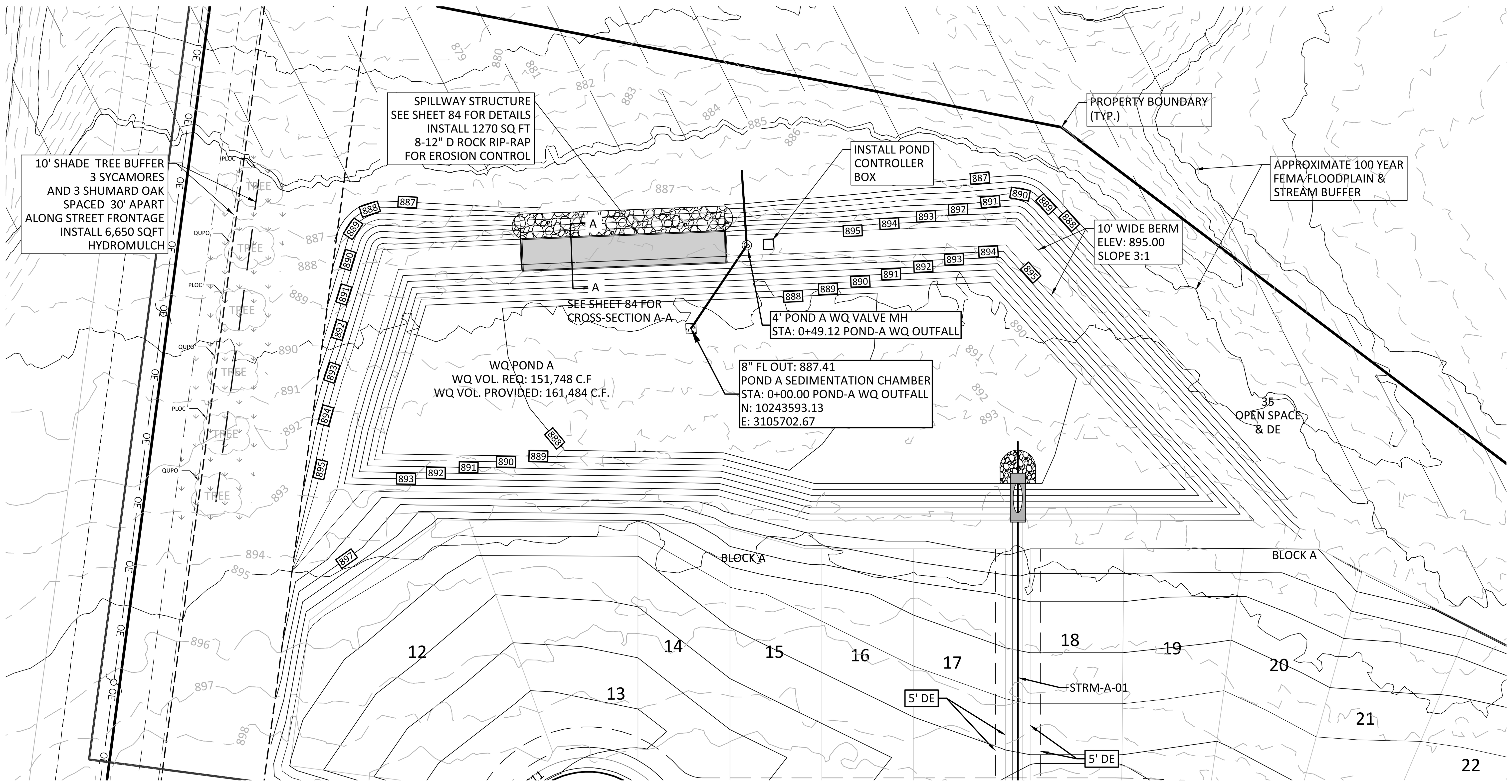
PHASE A OVERALL STORM SEWER PLAN
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	69 of 218 sheets

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\69 PHASE A OVERALL STORM SEWER PLAN.dwg By: Kevin Langford Date: 5/7/2024 9:50 AM

2021-21-CON





Pond A Volume			
Stage (ft)	Area (sf)	Avg End Area Volume (cf)	Avg End Area Cumulative Volume (cf)
887.08	0	0	0
888	12,517	5,758	5,758
889	27,136	19,826	25,584
890	31,360	29,248	54,832
891	34,107	32,734	87,566
892	36,938	35,523	123,088
893	39,854	38,396	161,484
894	42,854	41,354	202,838
895	45,938	44,396	247,234
	WQ Volume Required:		124,717

Construction Phase - Temporary Sediment Basin A

Elevation [ft]	Area [s.f.]	Avg End Incremental	Avg End Cumulative
887.08	0	0	0.00
888	12516.8	5758	5,757.73
889	27135.8	19826	25,584.03
890	31360.4	29248	54,832.13
891	34107	32734	87,565.83
892	36938.1	35523	123,088.38
893	39853.6	38396	161,484.23
894	42853.7	41354	202,837.88
895	45938.25	44396	247,276.08
3,000 Ft^3/Ac		Required =	126,534.00

100 YEAR DEV CFS	WQ POND A		
252.5	Elevation (ft)	Storage (cf)	Discharge (cfs)
Maximum WSE (ft)	887.08	0	0
894	888	5,758	0
Weir Elevation (ft)	889	25,584	0
893	890	54,832	0
Weir Length (ft)	891	87,566	0
100	892	123,088	0
	893	161,484	0
	894	202,838	300
	895	247,234	849
	100 YEAR CFS TO POND A		252.50

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = POND A

Total drainage basin/outfall area = **42.18** acres
Predevelopment impervious area within drainage basin/outfall area = **0.00** acres
Post-development impervious area within drainage basin/outfall area = **18.49** acres
st-development impervious fraction within drainage basin/outfall area = **0.44**
$L_{M\ THIS\ BASIN}$ = **16095** lbs. **17118 AT 85% REMOVAL**

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Batch Detention**
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 = **29.27** acres
A_I = **18.10** acres
A_P = **11.17** acres
L_R = **18412** lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = **17118** lbs.

F = **0.93**

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 = **2.20** inches
Post Development Runoff Coefficient = **0.43**
On-site Water Quality Volume = **101447** cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP = **15.55** 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 = **2484** cubic feet

Storage for Sediment = **20786**
Total Capture Volume (required water quality volume(s) x 1.20) = 124717 cubic feet

NOTES:
1. ALL VOLUMES WERE CALCULATED USING THE AVERAGE END AREA METHOD
2. THE BASIN SHALL BE STABILIZED WITH VEGETATION

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG — 03-15-2024
DESIGNED BY: DATE
TEH, TG, CL, EJH — 03-15-2024
DRAWN BY: DATE
TLH — 03-15-2024
CHECKED BY: DATE
TLH — 03-15-2024
APPROVED BY: DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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 A PLAN
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

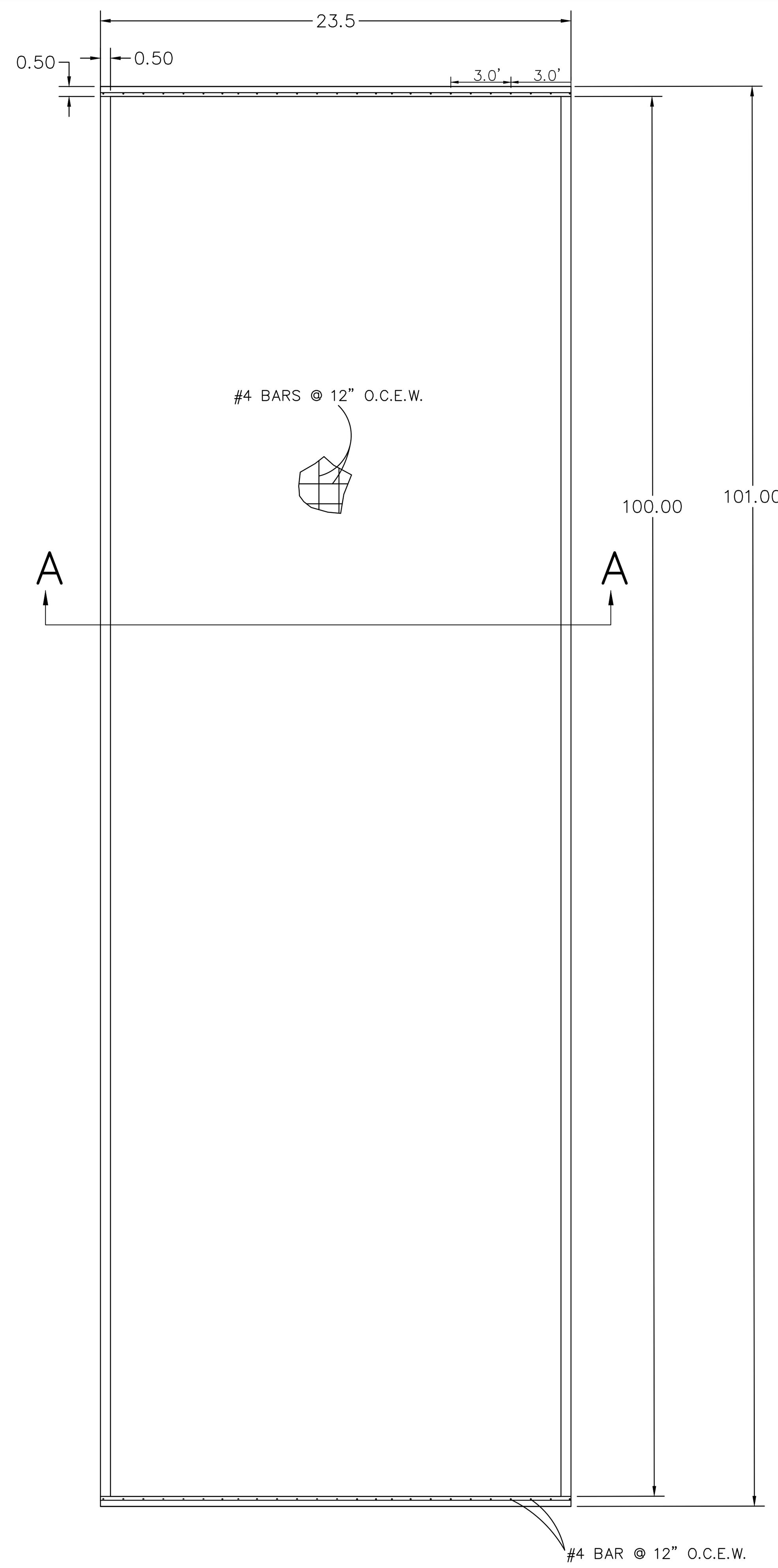
Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:
Sheet Number: 82 of 218 sheets

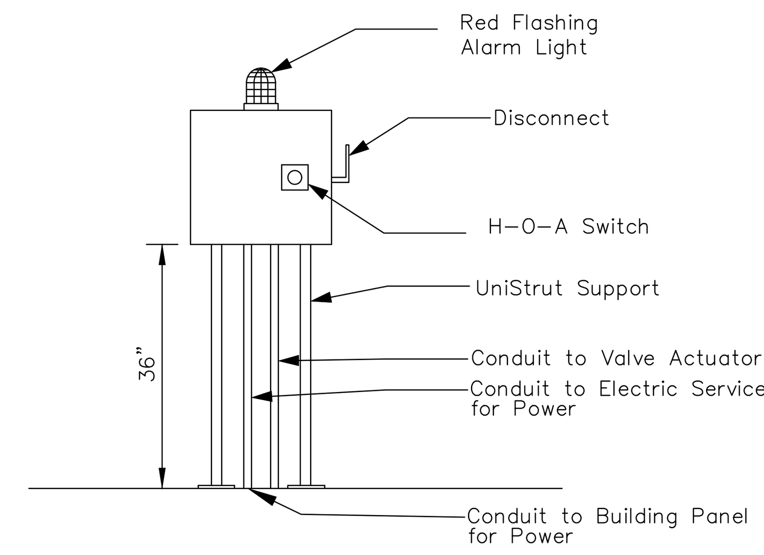
2021-21-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\82 WATER QUALITY POND A PLAN.dwg By: Kevin Langford Date: 5/7/2024 9:55 AM

3

SPILLWAY STRUCTURE FOR BATCH DETENTION BASIN



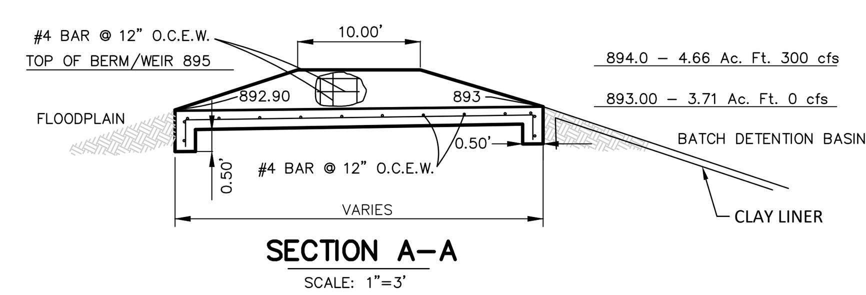


CONTROL / ALARM

NTS

WQ A OUTFALL WEIR PLAN

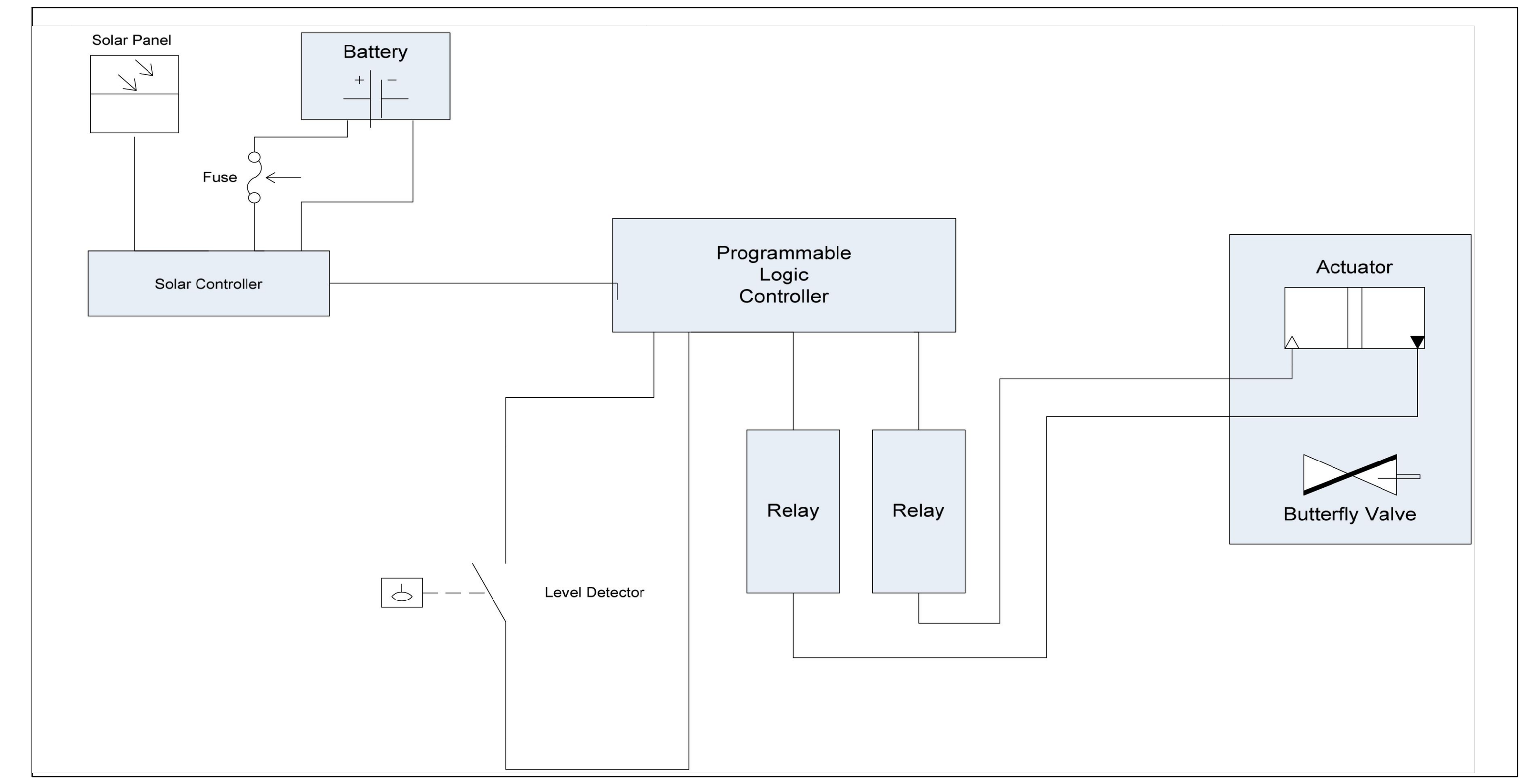
NOT TO SCALE



SECTION A–A

SCALE: 1"=3'

NOTE:
1. A BROAD CRESTED WEIR WITH A COEFFICENT OF 3.0 WAS USED FOR ALL CALCULATIONS



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 powdered 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).

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.

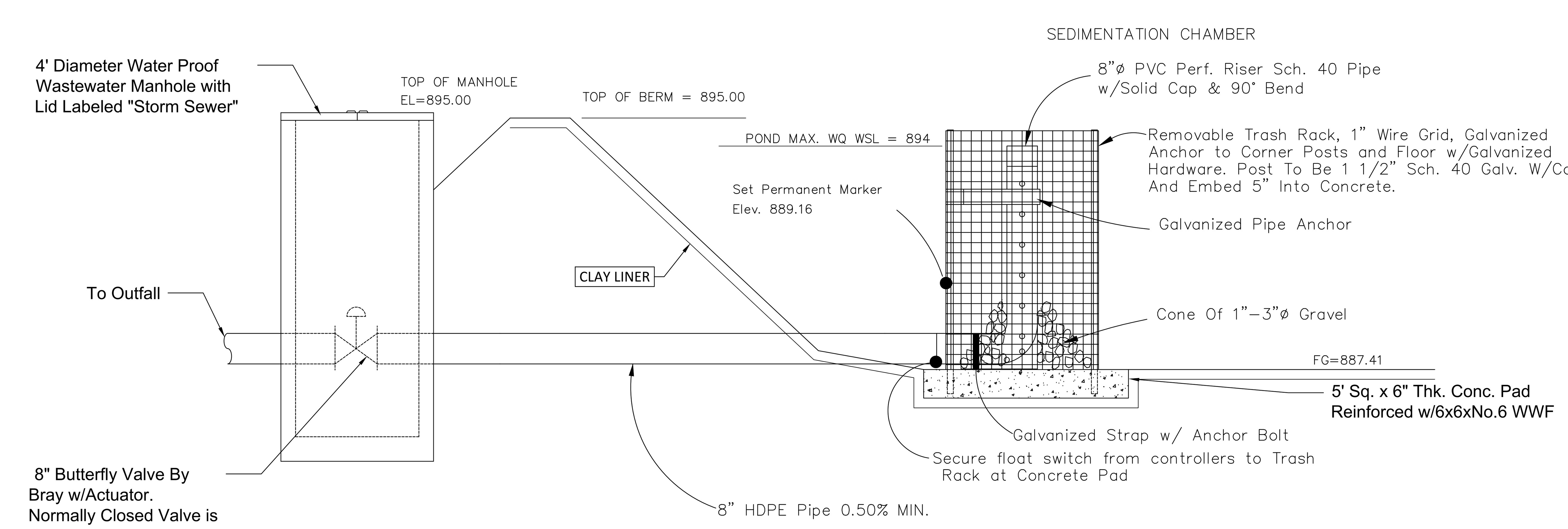
CLAY LINER SPECIFICATIONS (MIN. THICKNESS = 12")

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.)



Perforated Riser Pipes

Riser Pipe ø	Vert. Spacing Between Rows O.C.	No. Perforations Per Row	Diameter of Perforations
8"	4"	4	1"

SEDIMENTATION RISER PIPE

NTS

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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 A DETAILS

SOMERSET HILLS - PHASES A-E

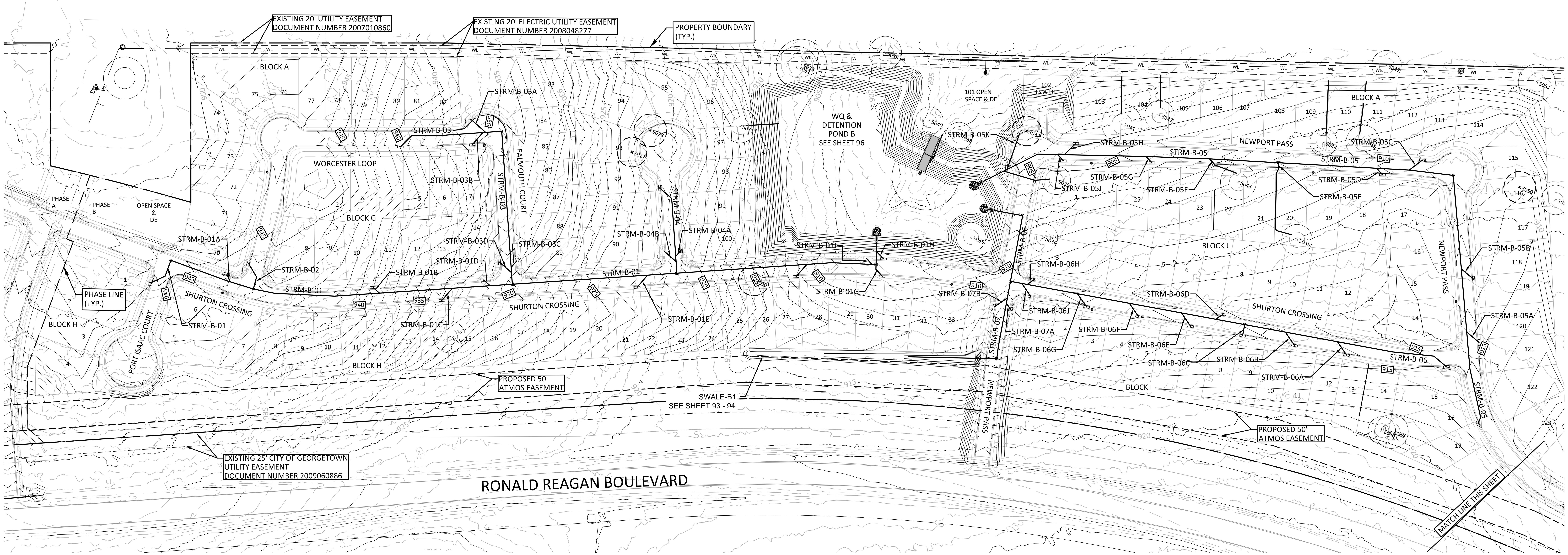
City of Georgetown
Williamson County, Texas

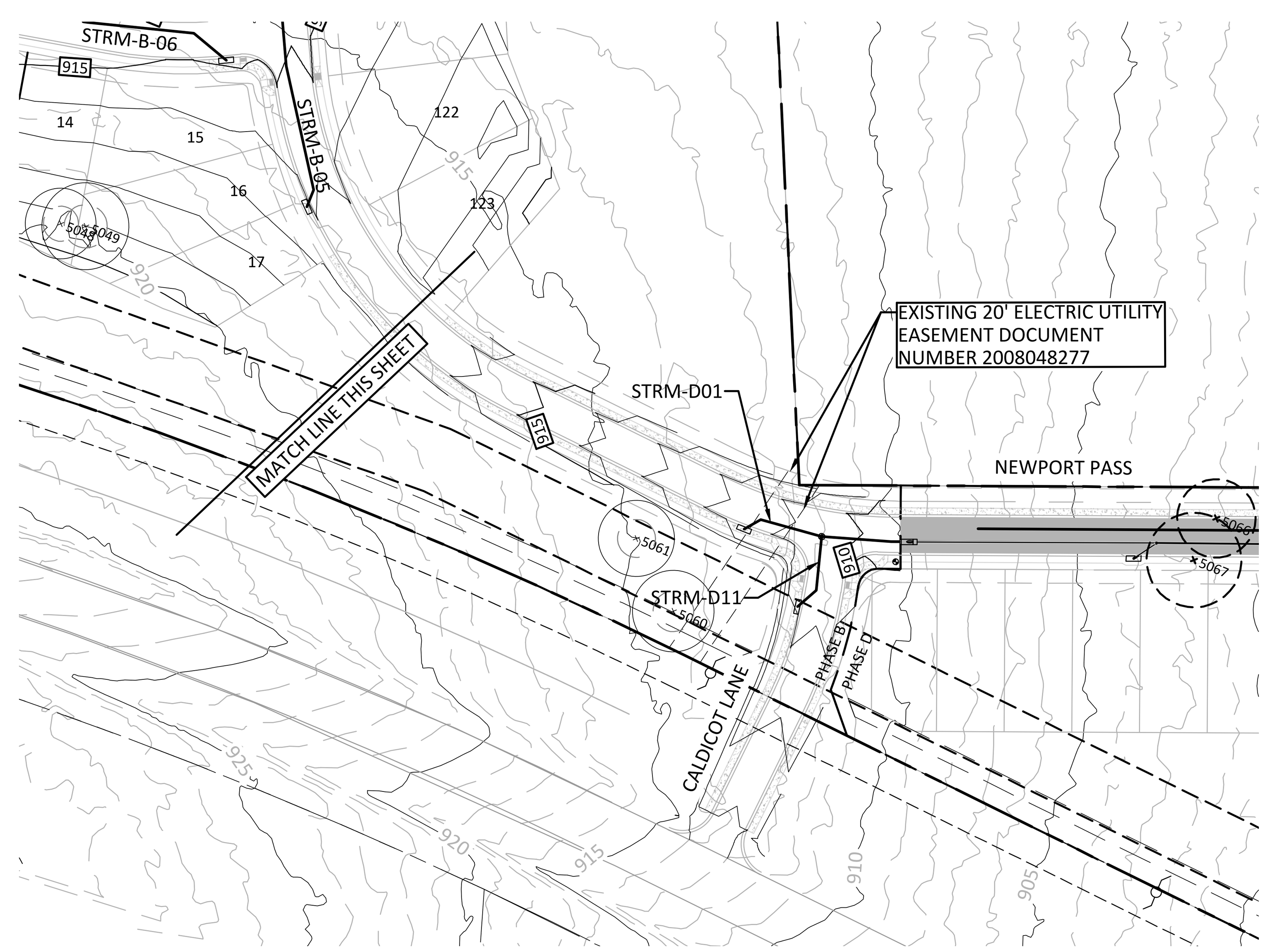
Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.	
Sheet Number:	83 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\83 WATER QUALITY POND A DETAILS.dwg By: Kevin Langford Date: 5/7/2024 12:49 PM

3





LEGEND

STORM LINE	
STORM MANHOLE	
STORM JUNCTION BOX	
CURB INLET	

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

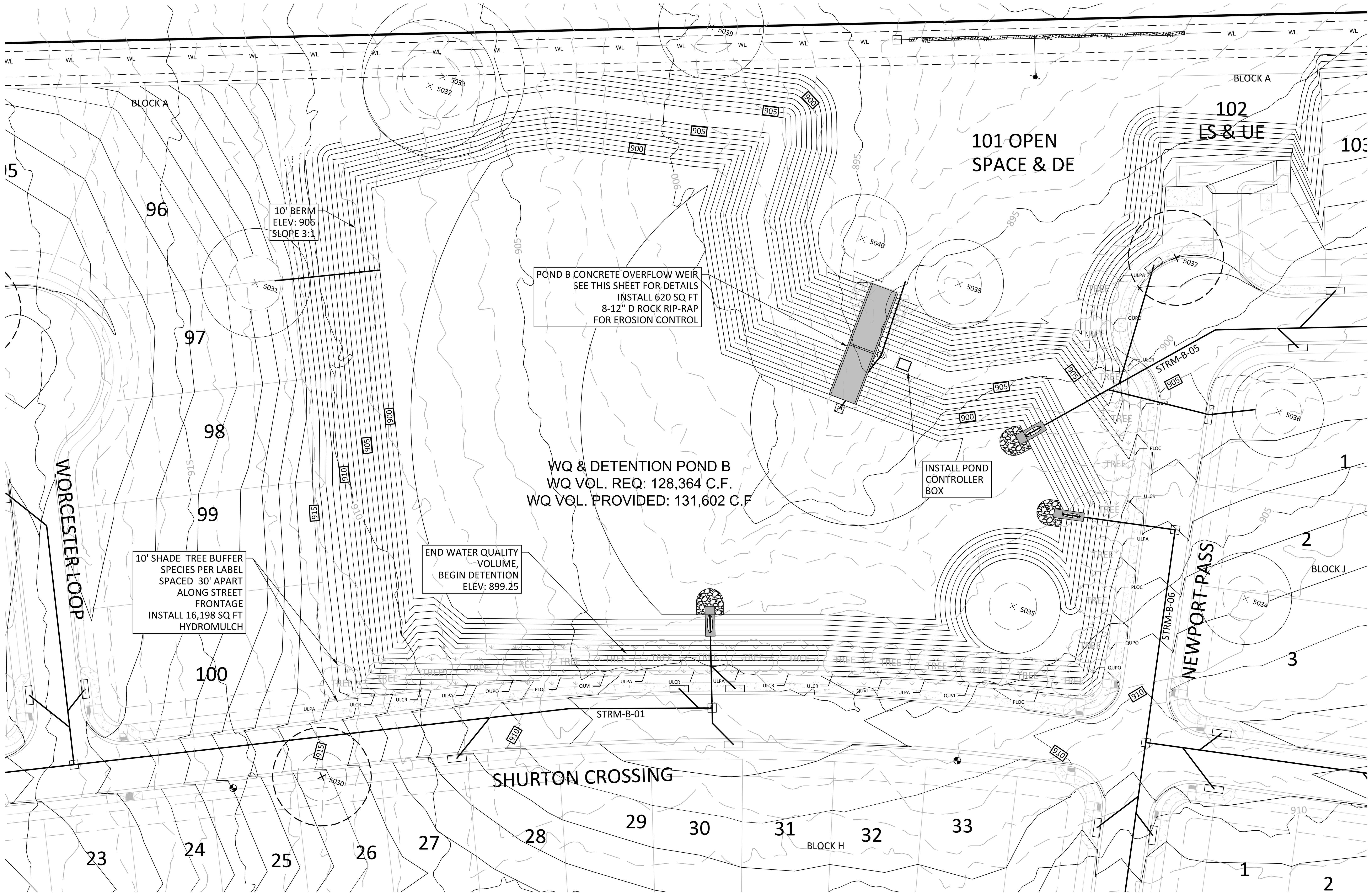
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

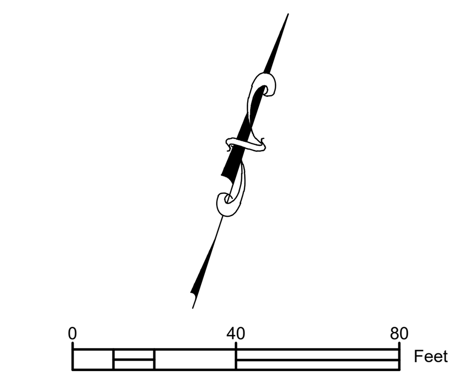
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	84 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\84 PHASE B OVERALL STORM SEWER PLAN.dwg By: Kevin Langford Date: 5/7/2024 10:08 AM





Construction Phase - Temporary Sediment Basin B			
Elevation [ft]	Area [s.f.]	Avg End Incremental	Avg End Cumulative
895.36	0	0	0.00
896	6,837	2188	2,187.81
897	36,205	21521	23,708.91
898	67,995	52100	75,809.16
899	76,384	72190	147,998.66
900	80,285	78334	226,332.91
901	84,322	82303	308,636.21
902	88,504	86413	395,049.16
903	92,803	90653	485,702.56
904	99,863	96333	582,035.46
905	104,116	288930	683,979.61
906	108,436	106276	790,255.86
3,000 Ft^3/Ac		Required =	151,917.00

NOTES:
1. ALL VOLUMES WERE CALCULATED USING THE AVERAGE END AREA METHOD
2. THE BASIN SHALL BE STABILIZED WITH VEGETATION

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = POND B

Total drainage basin/outfall area = 50.64 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 19.64 acres
Post-development impervious fraction within drainage basin/outfall area = 0.39
$L_{M\ THIS\ BASIN}$ = 17093 lbs. 18180 AT 85% REMOVAL

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
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 = 38.68 acres
A_I = 18.93 acres
A_P = 19.75 acres
L_R = 19387 lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 18180 lbs.

F = 0.94

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 = 2.40 inches
Post Development Runoff Coefficient = 0.35
On-site Water Quality Volume = 118546 cubic feet

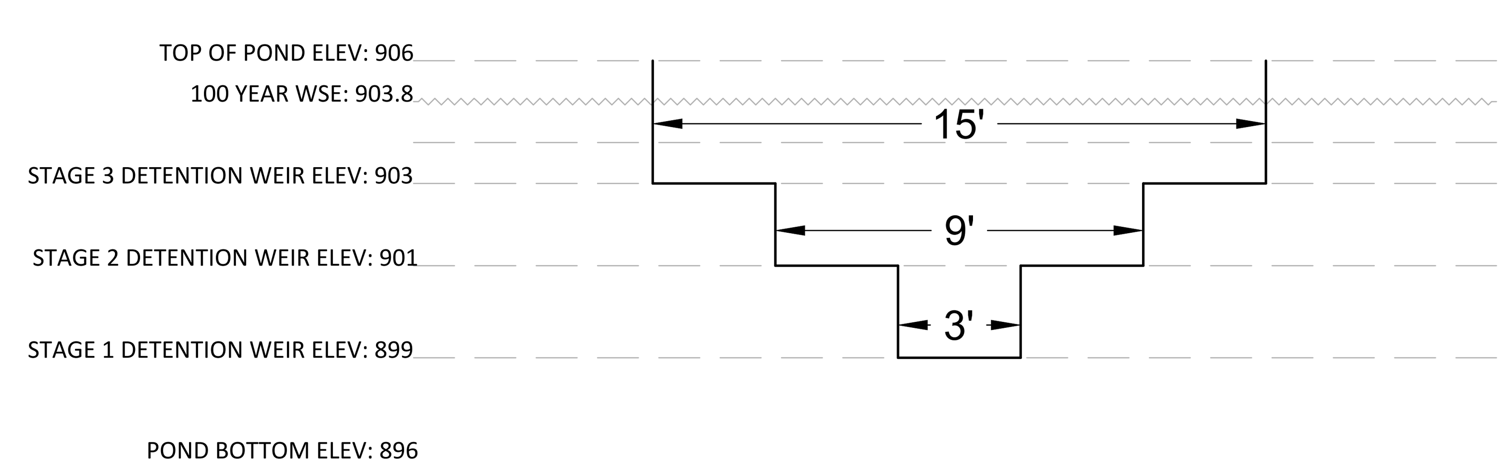
Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP = 7.35 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 = 1281 cubic feet

Storage for Sediment = 23965
Total Capture Volume (required water quality volume(s) x 1.20) = 143792 cubic feet

POND B OUTFALL STRUCTURE

N.T.S



ELEV: 899.00
WQ VOLUME MET
BEGIN DETENTION

POND B DETENTION ANALYSIS				
STORM	2	10	25	100
EX Q	110.9	199.5	250.4	326.4
PROP Q	26.5	83.2	123.4	190.5
MAX WSE	901	902.3	903	903.9

POND B VOLUME			
Stage (ft)	Area (sf)	Avg End Area Volume (cf)	Avg End Area Cumulative Volume (cf)
895.36	0	0	0
896	6,837	2,188	2,188
897	36,205	21,521	23,709
898	67,995	52,100	75,809
899	76383.8	72,190	147,999
900	80284.7	78,334	226,333
901	84321.9	82,303	308,636
902	88504	86,413	395,049
903	92802.8	90,653	485,703
904	99863	96,333	582,035
905	104116	101,990	684,025
906	108436	106,276	790,301
		Required:	143,792

	Weir 1	Weir 2	Weir 3
FL Elevation	899.25	901	903
Weir Length (ft)	3	6	8

100 Year CFS	326.4

WSE	Weir 1	Weir 2	Weir 3	Weir 4	Total Discharge (cfs)
896	0	0	0	0	0
897	0	0	0	0	0
898	0	0	0	0	0
899	0	0	0	0	0
899.25	0	0	0	0	0
900	5.845671	0	0	0	5.85
901	20.83529	0	0	0	20.84
902	41.04323	18	0	0	59.04
903	65.35659	50.91169	0	0	116.27
904	93.17146	93.53074	24	0	210.70
905	124.0921	144	67.88225	0	335.97
906	157.8331	201.2461	124.7077	0	483.79

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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 B PLAN

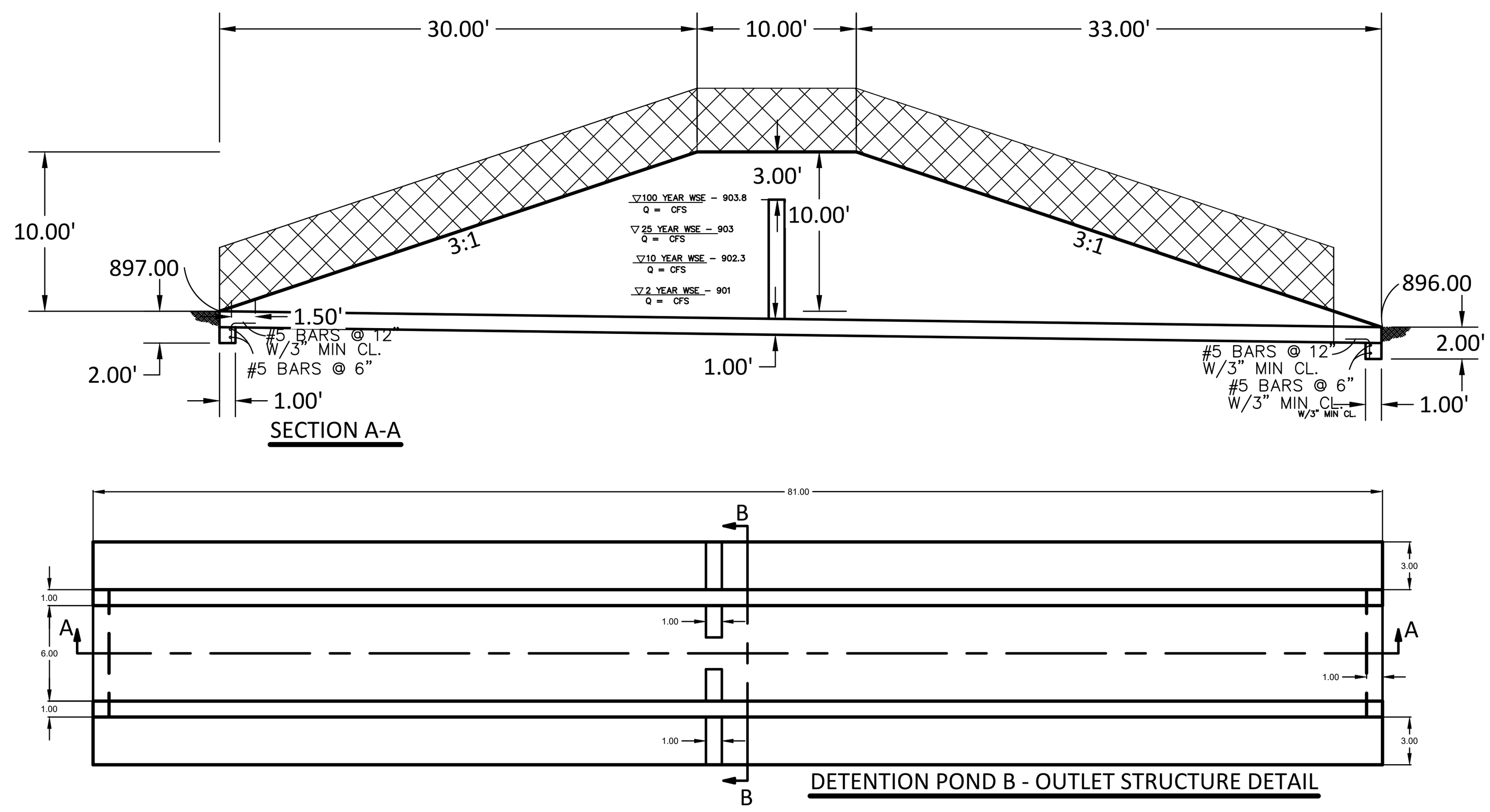
SOMERSET HILLS - PHASES A-E

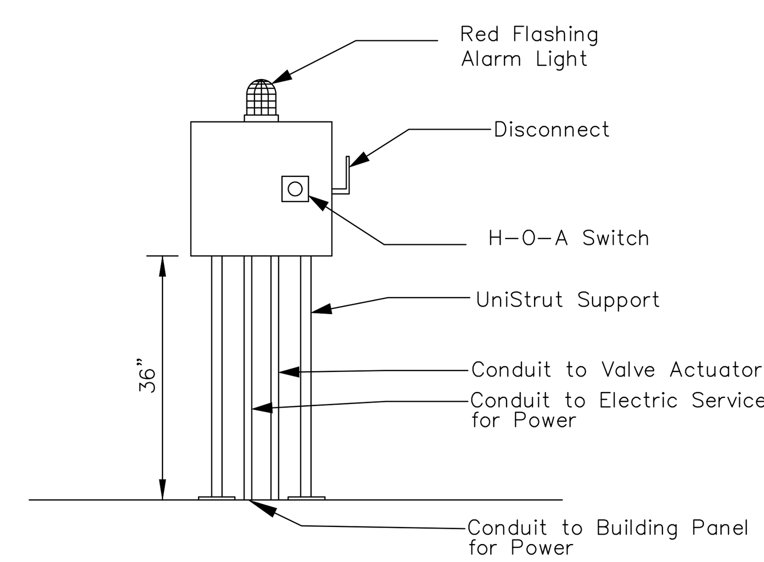
City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.
Sheet Number: 97 of 218 sheets

2021-21-CON

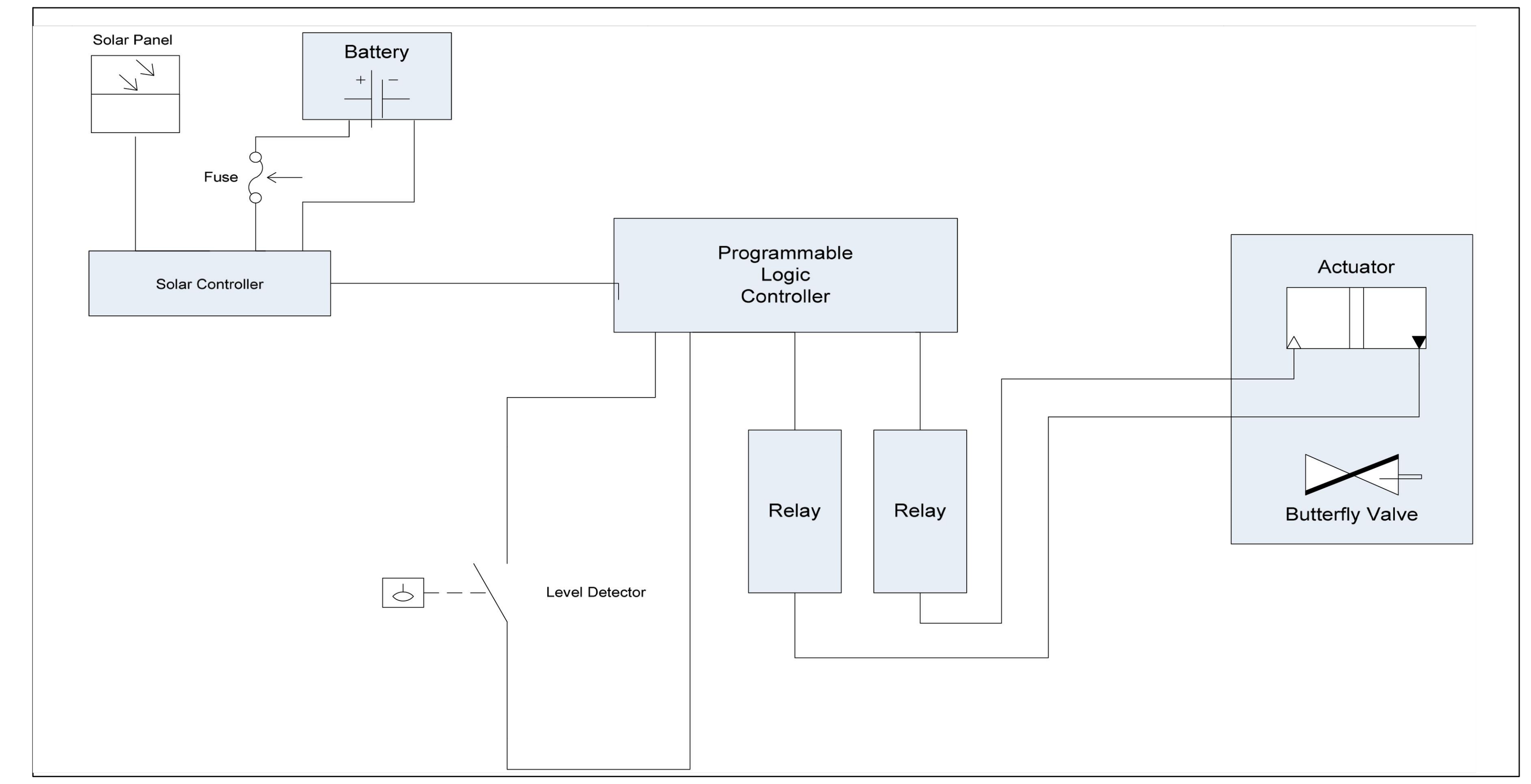
File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\97 WATER QUALITY AND DETENTION POND B PLAN.dwg By: Kevin Langford Date: 5/7/2024 10:07 AM





CONTROL / ALARM

NTS



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 powdered 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).

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")

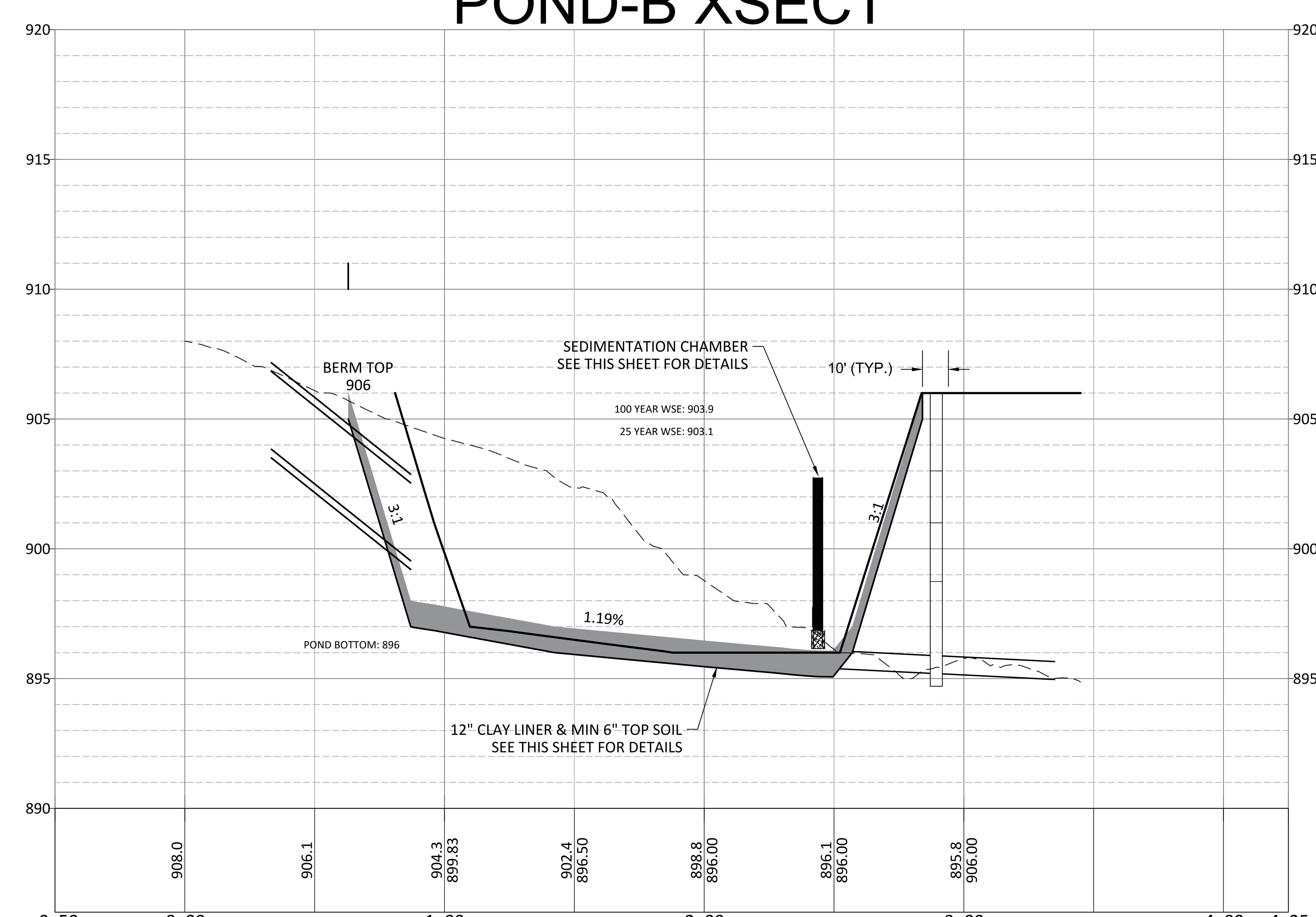
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
PERMEABILITY	ASTM D-2434	Cm/Sec	$1X10^{(-6)}$
PLASTICITY INDEX OF CLAY	ASTM D-423 & D-424	%	NOT LESS THAN 15
LIQUID LIMIT OF CLAY	ASTM D-2216	%	NOT LESS THAN 30
CLAY PARTICLES PASSING	ASTM D-422	%	NOT LESS THAN 30
CLAY COMPACTION	ASTM D-2216	%	95% OF STANDARD PROCTOR 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.

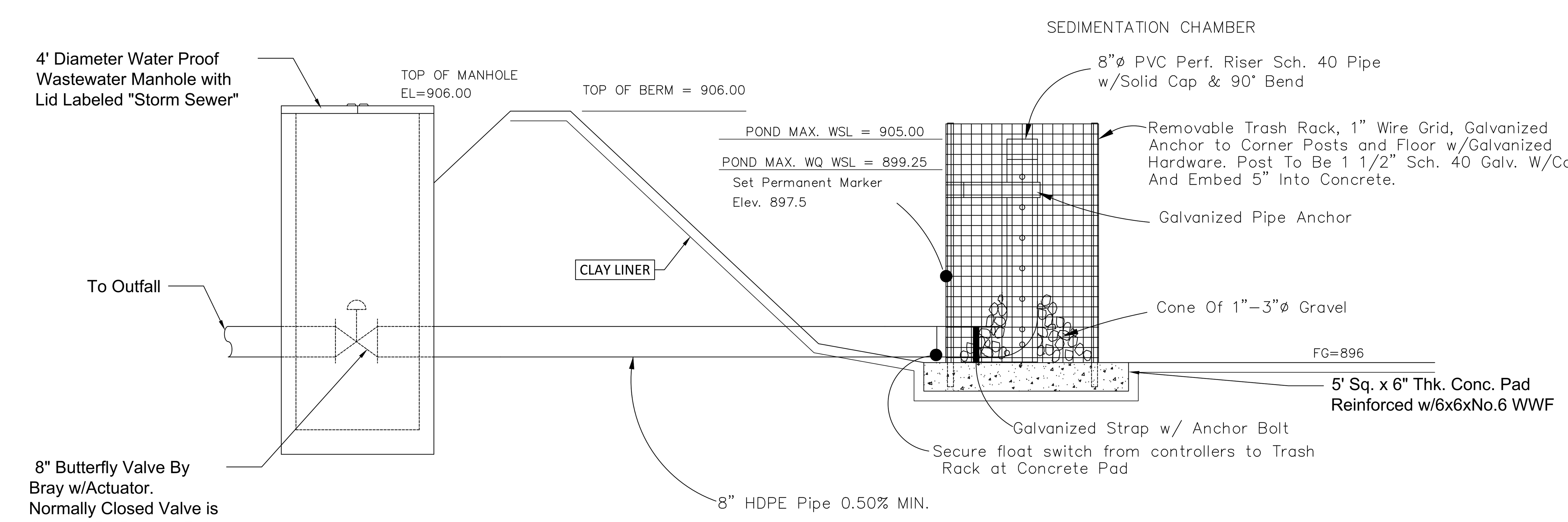
GEOTEXTILE FABRIC DATA

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-B XSECT



THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.



Perforated Riser Pipes

Riser Pipe ø	Vert. Spacing Between Rows O.C.	No. Perforations Per Row	Diameter of Perforations
8"	4"	4	1"

SEDIMENTATION RISER PIPE

NTS

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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/7/2024

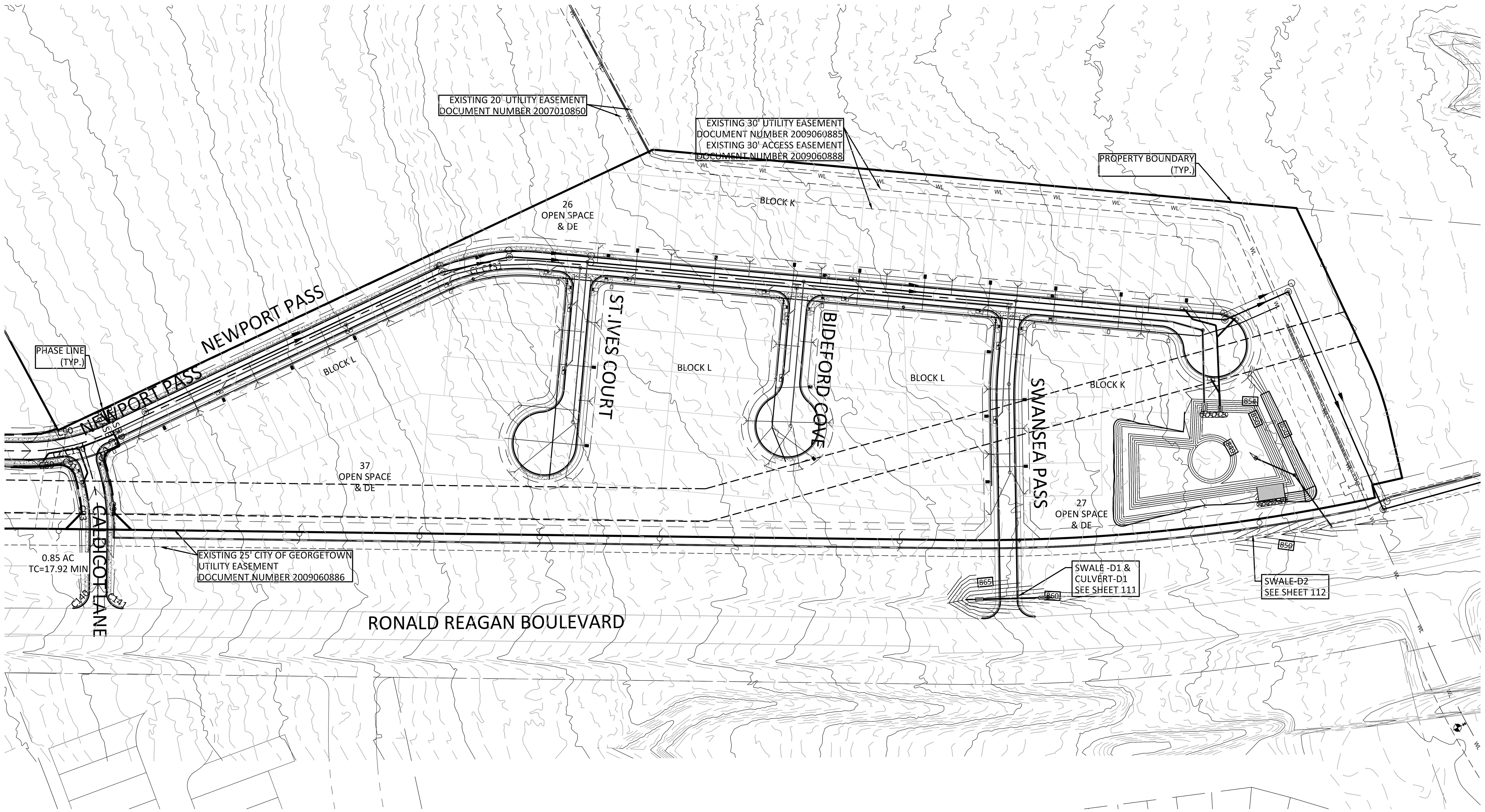
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

WATER QUALITY POND B DETAILS
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.	
Sheet Number:	98 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\98 WATER QUALITY POND B DETAILS.dwg By: Kevin Langford Date: 5/7/2024 12:54 PM



0 100 200 Feet

LEGEND

- STORM MANHOLE
- STORM JUNCTION BOX
- WASTEWATER MANHOLE
- CURB INLET
- AREA INLET

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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

TLH, CL, EJH, TG — 03-15-2024
DESIGNED BY: DATE
TEH, TG, CL, EJH — 03-15-2024
DRAWN BY: DATE
TLH — 03-15-2024
CHECKED BY: DATE
TLH — 03-15-2024
APPROVED BY: DATE

STATE OF TEXAS — BRYAN ERIC MOORE — 98920 — LICENSED PROFESSIONAL ENGINEER — 11/11/21

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

PHASE D OVERALL STORM SEWER PLAN

SOMERSET HILLS - PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.
Sheet Number: 104 of 218 sheets

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\104 PHASE D OVERALL STORM SEWER PLAN.dwg By: Kevin Langford Date: 5/7/2024 12:57 PM

2021-21-CON

POND C VOLUME

Stage (ft)	Contour Area (sf)	Avg End Area Volume (cf)	Avg End Area Cumulative Volume (cf)
847	25	0	0
848	6,481	3,253	3,253
849	14,007	10,244	13,497
850	16,499	15,253	28,750
851	19,091	17,795	46,545
852	23,934	21,513	68,058
853	26,114	25,024	93,082
854	28,368	27,241	120,323
	WQ Volume Required:		**39,411**

EMERGENCY OVERFLOW WEIR CALCULATIONS

Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
847	0	0
848	0.07	0
849	0.31	0
850	0.66	0
851	1.07	0
852	1.56	0
853	2.14	120
854	2.76	339.411255
100 YEAR CFS TO POND B		117.44

Construction Phase - Temporary Sediment Basin C

Elevation [ft]	Area [s.f.]	Avg End Incremental Volume [c.f.]	Avg End Cumulative Volume [c.f.]
847	25	0	0.00
848	6481	3253	3,253.00
849	14007.2857	10244	13,497.14
850	16498.9442	15253	28,750.26
851	19091.0055	17795	46,545.23
852	23934.094	21513	68,057.78
853	26113.8765	25024	93,081.77
854	28368.2469	27241	120,322.83
3,000 Ft^3/Ac		Required =	61,728.00

NOTES:
1. ALL VOLUMES WERE CALCULATED USING THE AVERAGE END AREA METHOD
2. THE BASIN SHALL BE STABILIZED WITH VEGETATION

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = POND C

Total drainage basin/outfall area = **20.58** acres
Predevelopment impervious area within drainage basin/outfall area = **0.00** acres
Post-development impervious area within drainage basin/outfall area = **6.33** acres
Post-development impervious fraction within drainage basin/outfall area = **0.31**
$L_{M\ THIS\ BASIN}$ = **5506** lbs. **5856 AT 85% REMOVAL**

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Batch Detention**
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 = **12.72** acres
A_I = **6.21** acres
A_P = **6.51** acres
L_R = **6355** lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = **5856** lbs.
F = **0.92**

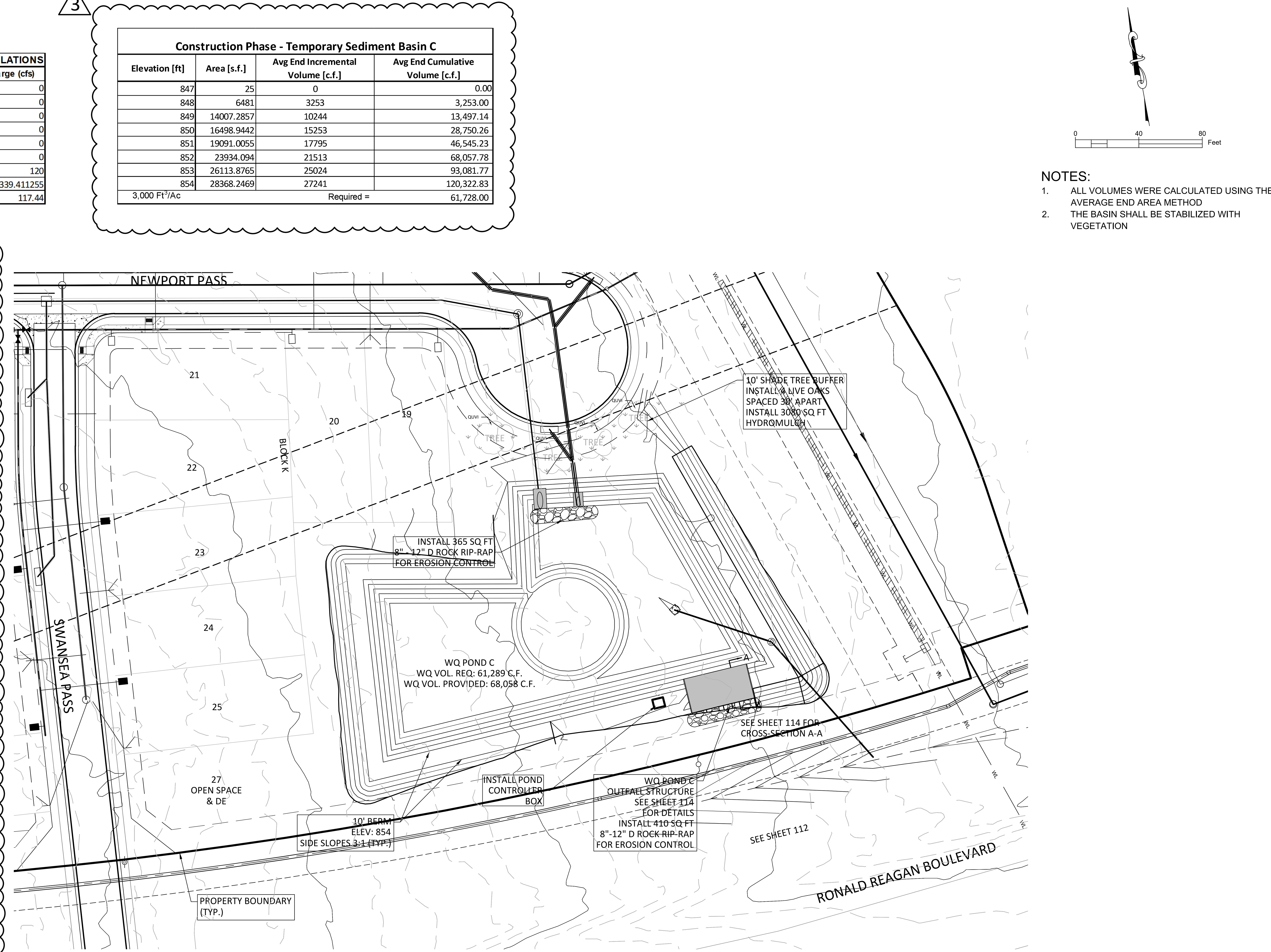
6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth = **2.00** inches
Post Development Runoff Coefficient = **0.35**
On-site Water Quality Volume = **32405** cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP = **3.01** 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 = **437** cubic feet

Storage for Sediment = **6568**
Total Capture Volume (required water quality volume(s) x 1.20) = 39411 cubic feet



THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.

STATE OF TEXAS — TYSON L. HASZ — 145151 — LICENSED PROFESSIONAL ENGINEER — 5/7/2024

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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG — 03-15-2024
DESIGNED BY: — DATE
TEH, TG, CL, EJH — 03-15-2024
DRAWN BY: — DATE
TLH — 03-15-2024
CHECKED BY: — DATE
TLH — 03-15-2024
APPROVED BY: — DATE

STATE OF TEXAS — BRYAN ERIC MOORE — 98920 — LICENSED PROFESSIONAL ENGINEER — 11/11/21

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

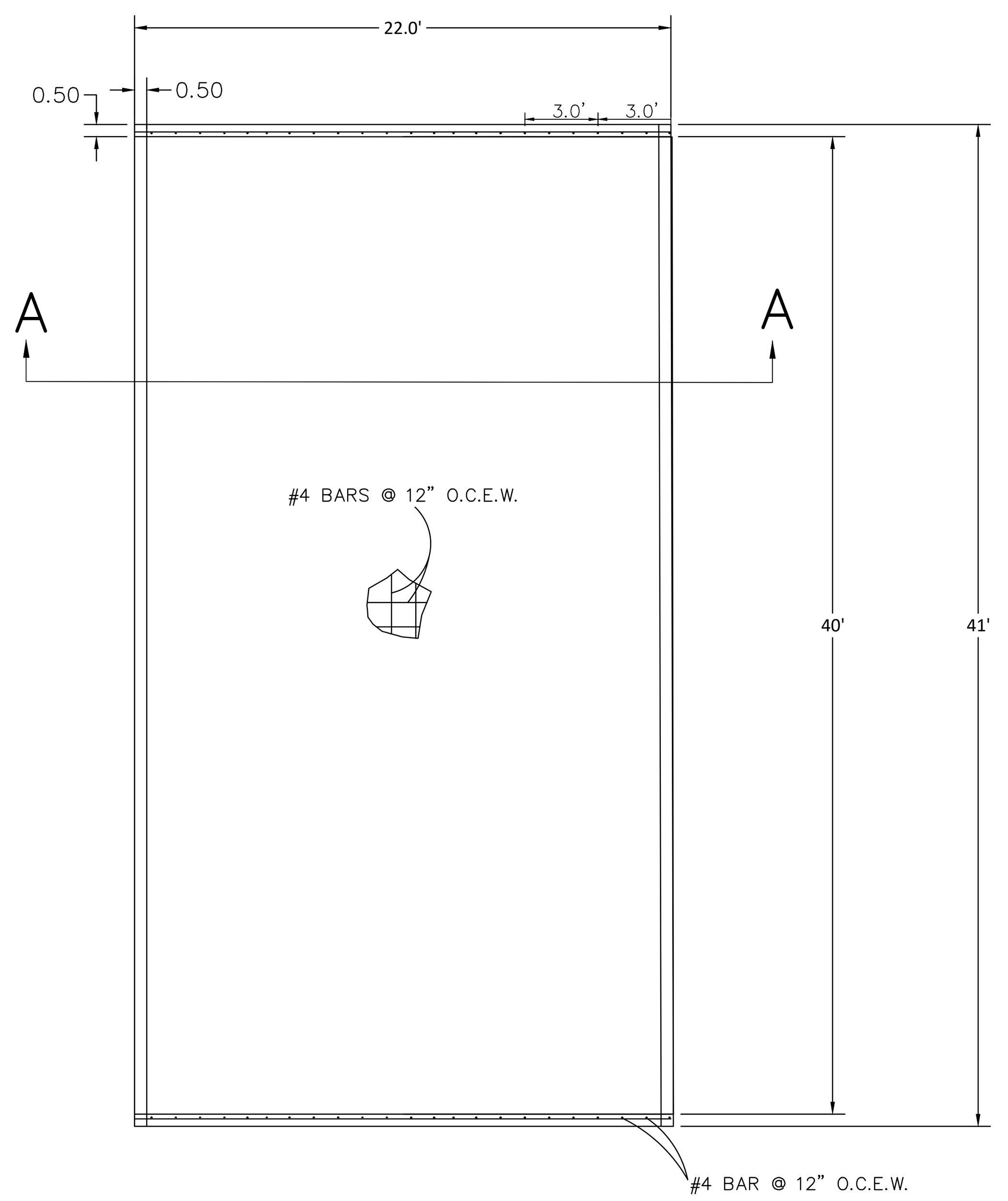
WATER QUALITY POND C PLAN
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

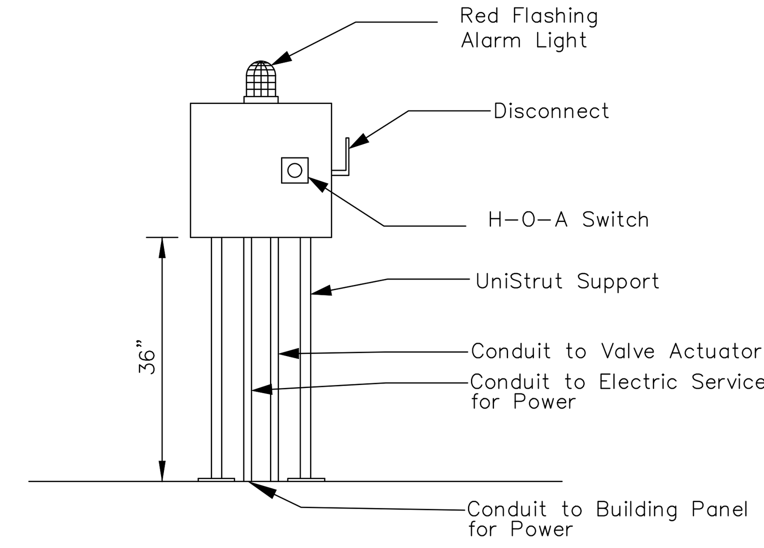
Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.
Sheet Number: 113 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\113 WATER QUALITY POND C PLAN.dwg By: Kevin Langford Date: 5/7/2024 5:02 PM

SPILLWAY STRUCTURE FOR BATCH DETENTION BASIN C



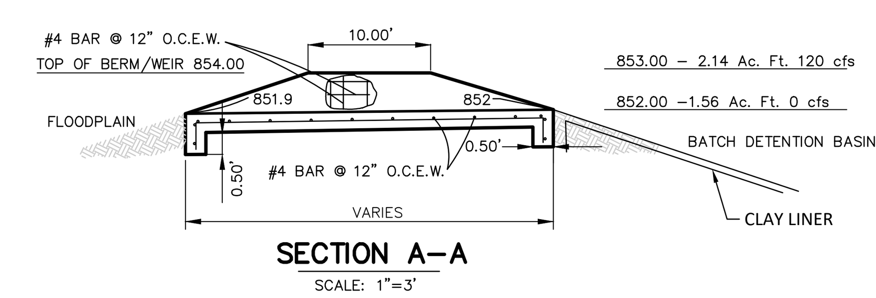


CONTROL / ALARM

NTS

WQ C OUTFALL WEIR PLAN

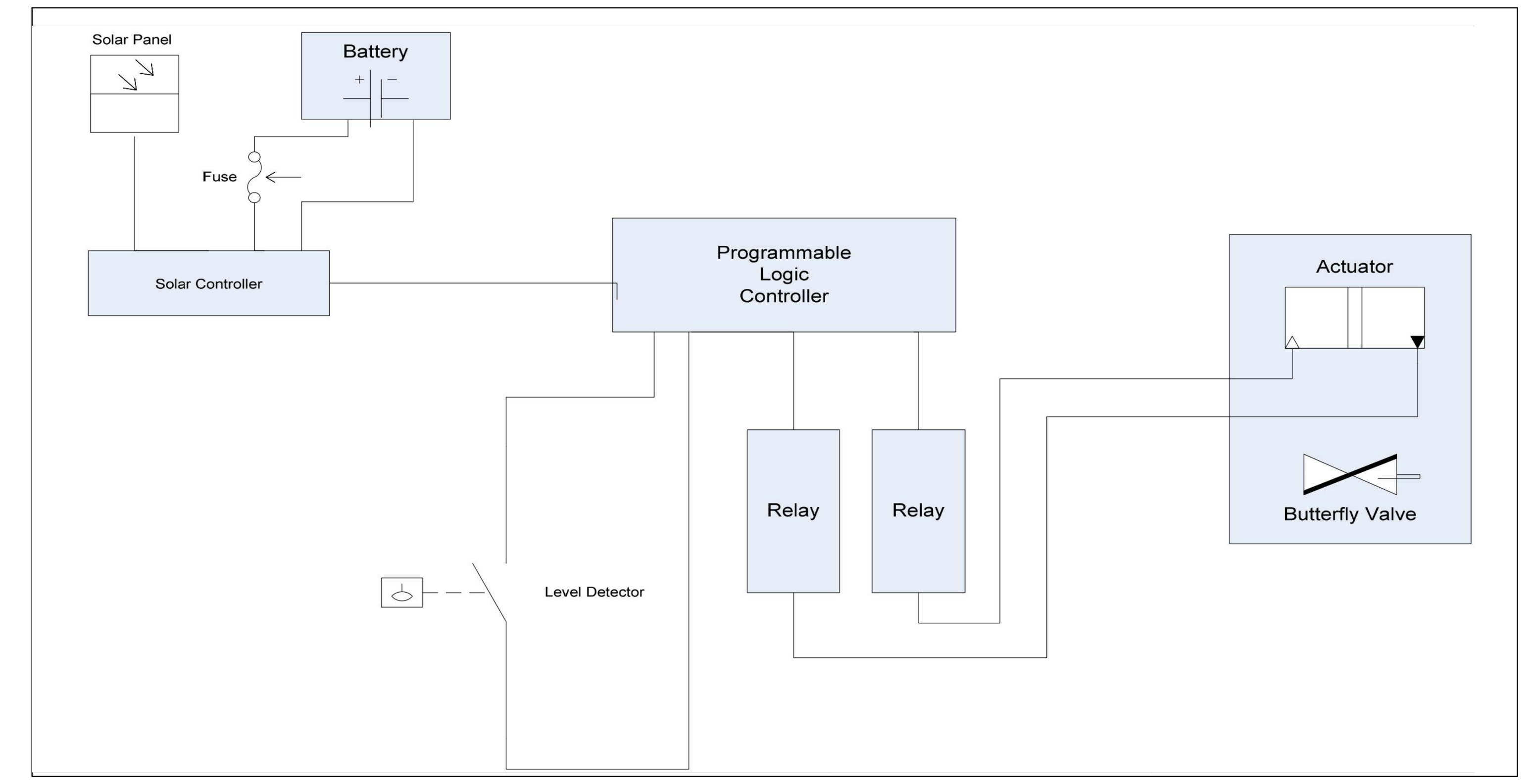
NOT TO SCALE



SECTION A–A

SCALE: 1"=3'

NOTE:
1. A BROAD CRESTED WEIR WITH A COEFFICENT OF 3.0 WAS USED FOR ALL CALCULATIONS



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 powdered 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).

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")

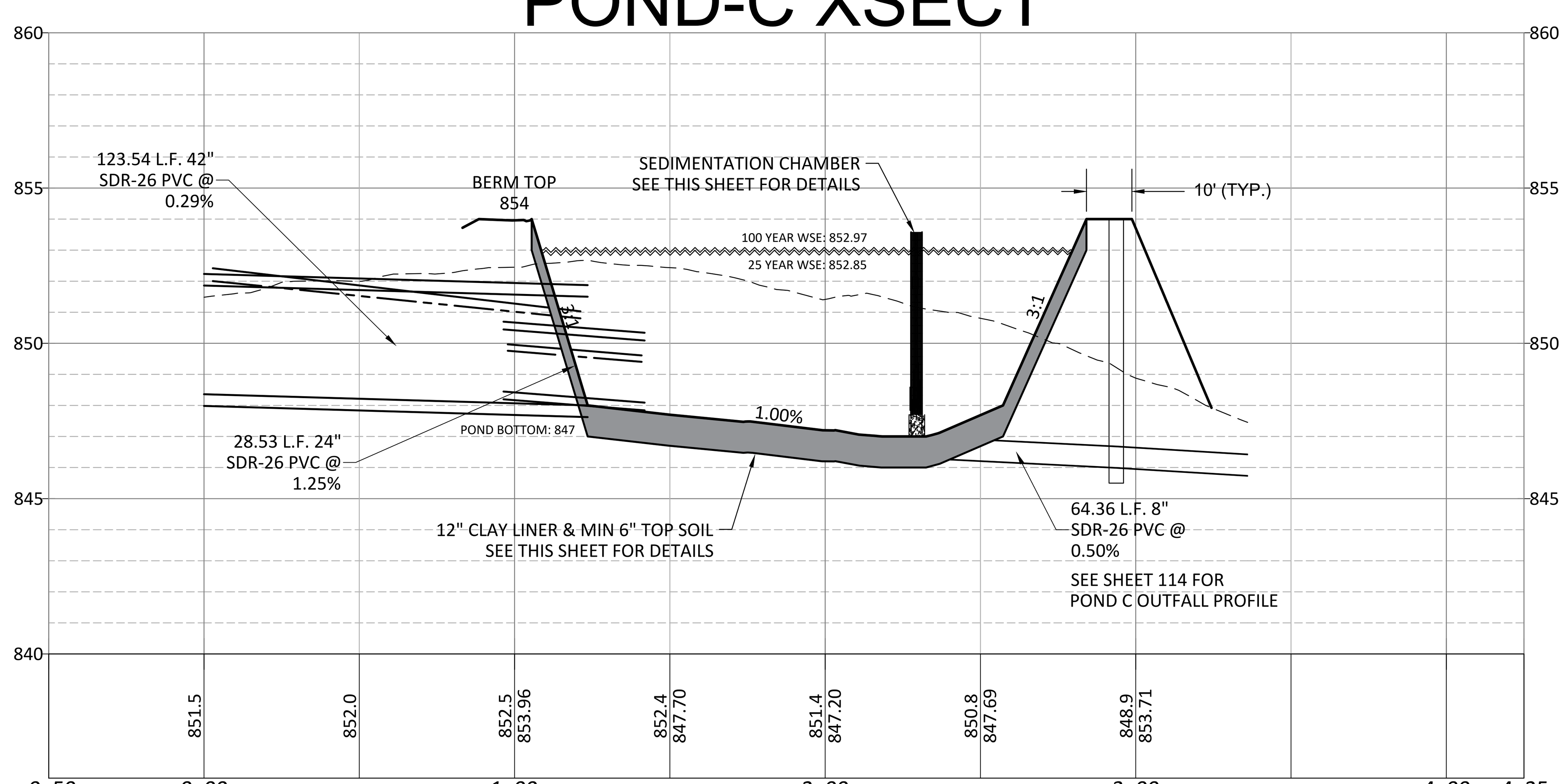
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
PERMEABILITY	ASTM D-2434	Cm/Sec	$1X10^{(-6)}$
PLASTICITY INDEX OF CLAY	ASTM D-423 & D-424	%	NOT LESS THAN 15
LIQUID LIMIT OF CLAY	ASTM D-2216	%	NOT LESS THAN 30
CLAY PARTICLES PASSING	ASTM D-422	%	NOT LESS THAN 30
CLAY COMPACTION	ASTM D-2216	%	95% OF STANDARD PROCTOR 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.

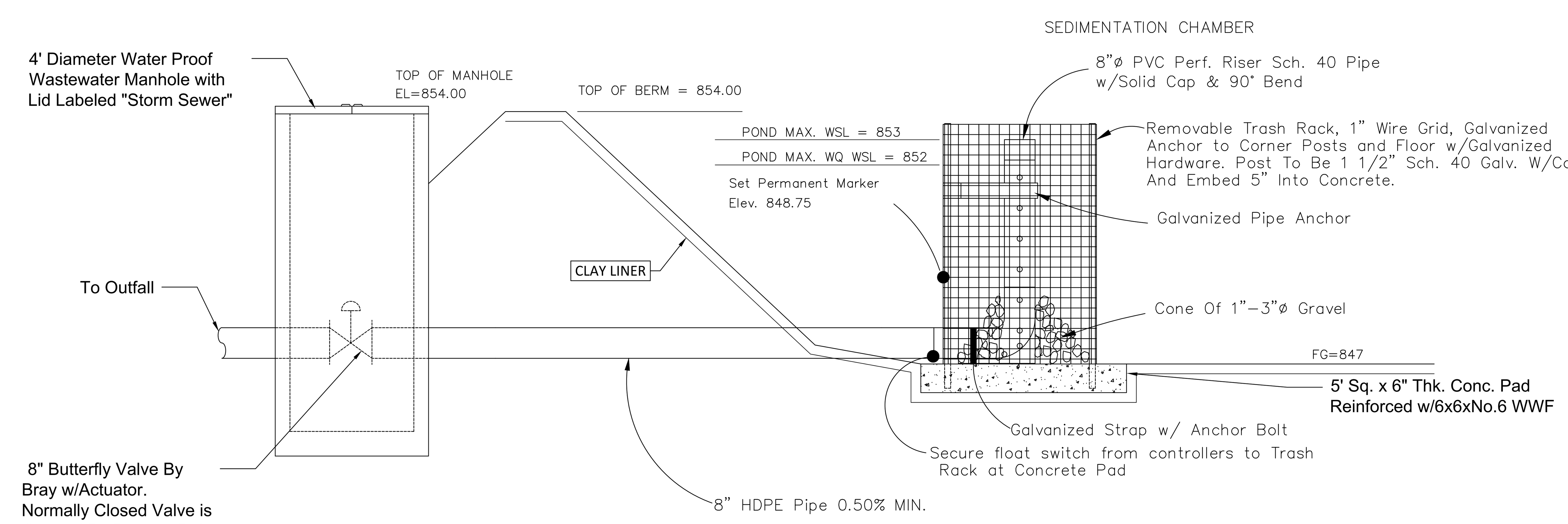
GEOTEXTILE FABRIC DATA

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-C XSECT



THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.



Perforated Riser Pipes

Riser Pipe ø	Vert. Spacing Between Rows O.C.	No. Perforations Per Row	Diameter of Perforations
8"	4"	4	1"

SEDIMENTATION RISER PIPE

NTS

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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

STEGER BIZZELL

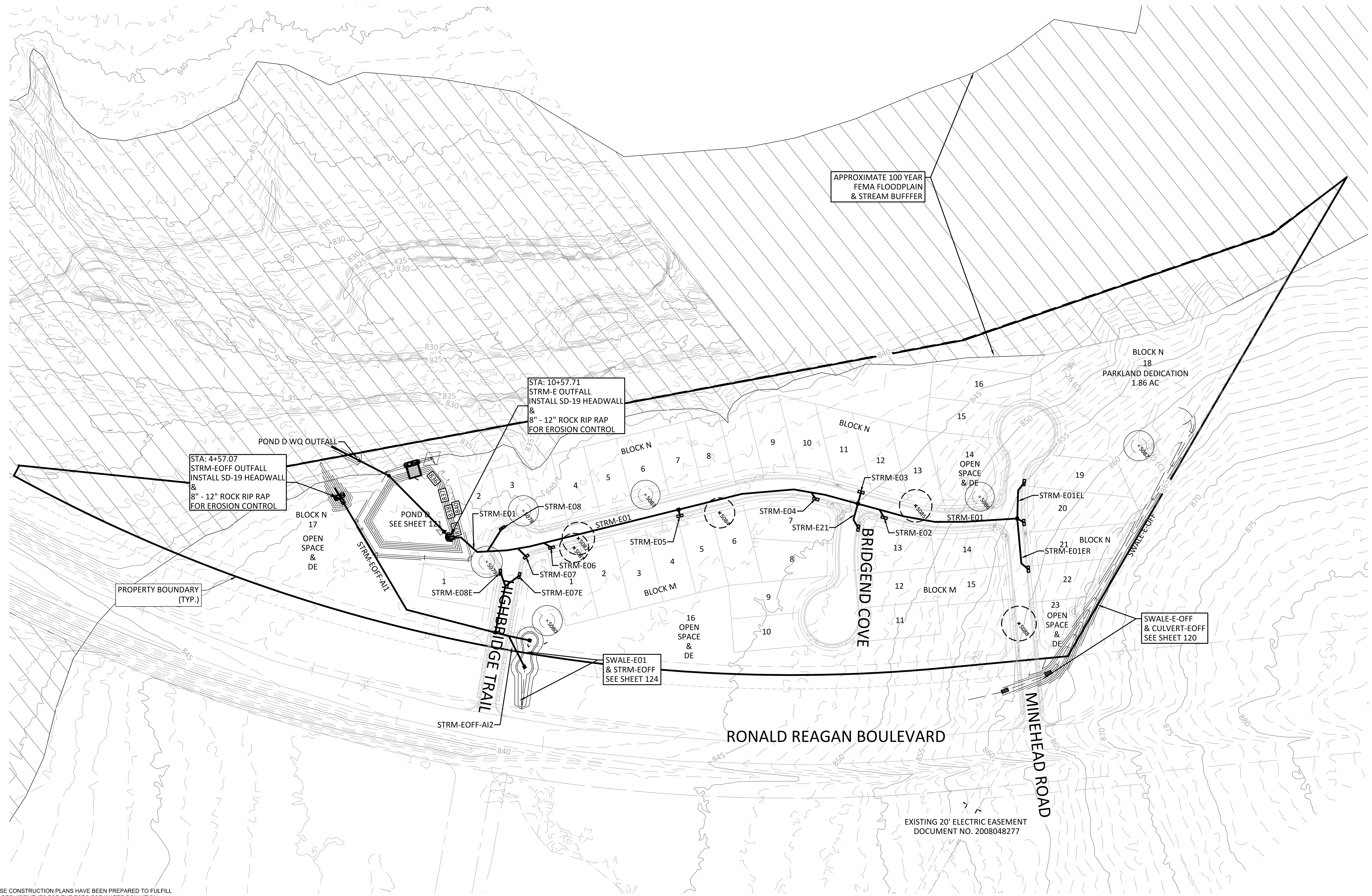
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

WATER QUALITY POND C DETAILS
SOMERSET HILLS PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P\22000-22999
Xref DWG FILE.	SOMERSET HILLS
Sheet Number:	114 of 218 sheets

File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\114 WATER QUALITY POND C DETAILS.dwg By: Amber Camilleri Date: 10/30/2021 12:18 PM

2021-21-CON



LEGEND

- STORM LINE
- STORM MANHOLE
- STORM JUNCTION BOX
- CURB INLET
- AREA INLET

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

PHASE E OVERALL STORM SEWER PLAN

SOMERSET HILLS PHASES A-E

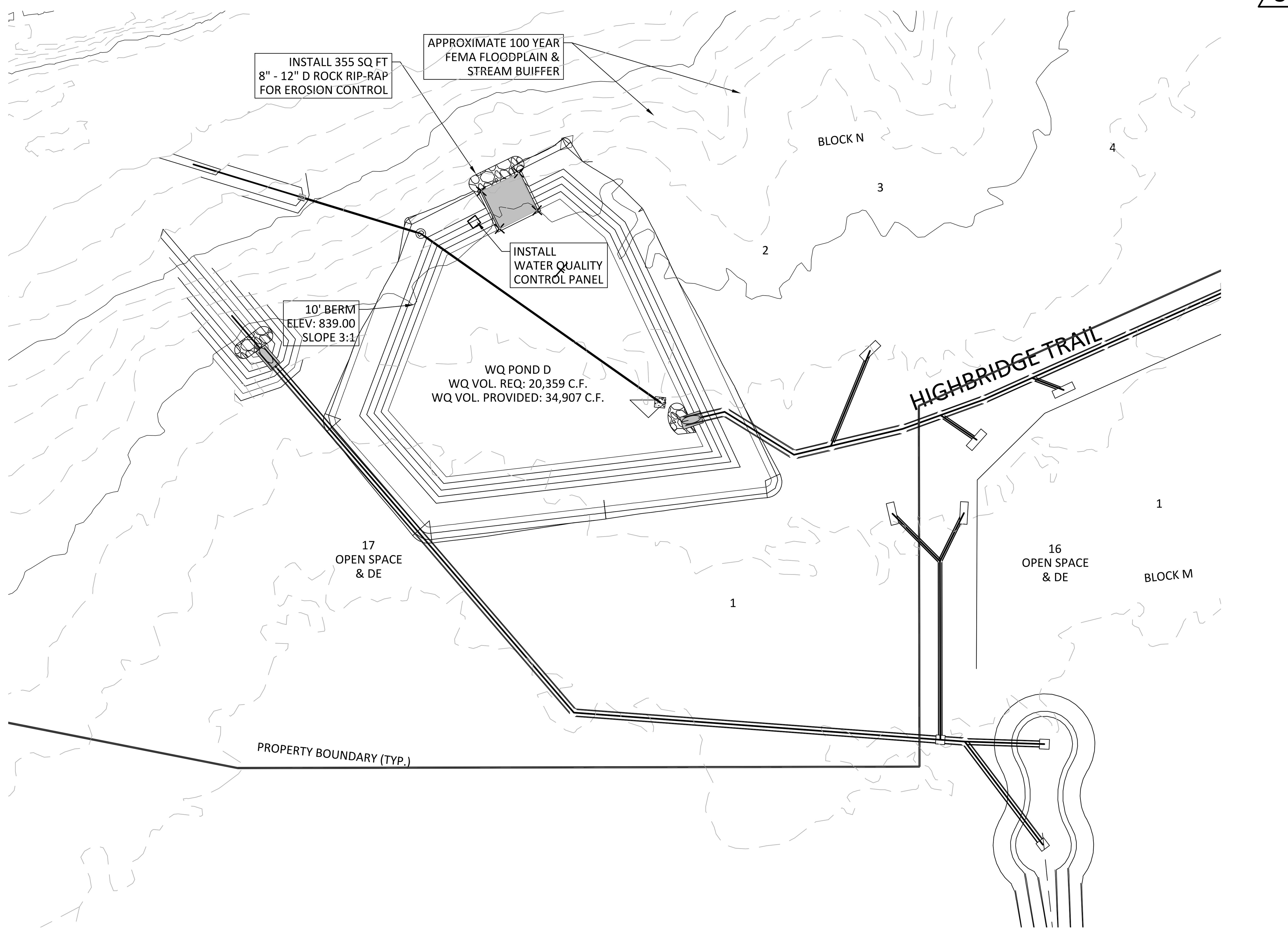
City of Georgetown
Williamson County, Texas

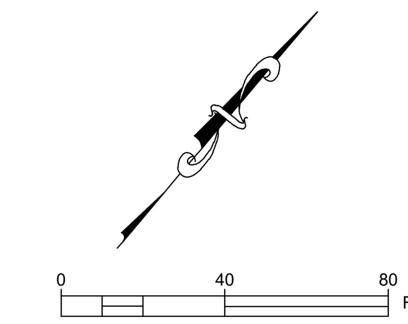
Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P\22000-22999 SOMERSET HILLS
Xref DWG FILE:	
Sheet Number:	115 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\115 PHASE E OVERALL STORM SEWER PLAN.dwg By: Amber Camilleri Date: 10/30/2021 12:41 PM

NOTES:
1. ALL VOLUMES WERE CALCULATED USING THE AVERAGE END AREA METHOD
2. THE BASIN SHALL BE STABILIZED WITH VEGETATION





3

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = POND D

Total drainage basin/outfall area =	19.77	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	3.88	acres
Post-development impervious fraction within drainage basin/outfall area =	0.20	
$L_{M\ THIS\ BASIN}$ =	3381	lbs.

3596 AT 85% REMOVAL

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Batch Detention**
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 =	7.17	acres
A_I =	3.66	acres
A_P =	3.51	acres
L_R =	3747	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = **3596** lbs.

F = **0.96**

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 =	2.80	inches
Post Development Runoff Coefficient =	0.36	
On-site Water Quality Volume =	26503	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 =	5301	
Total Capture Volume (required water quality volume(s) x 1.20) =	**31804**	cubic feet

3

POND D VOLUME

Stage (ft)	Area (sf)	Avg End Area Volume (cf)	Avg End Area Cumulative Volume (cf)
834	25	0	0
835	12,846	6,436	6,436
836	14,219	13,532	19,968
837	15,659	14,939	34,907
838	16,503	16,081	50,988
839	18,741	17,622	68,610
WQ Volume Required:			**31,804**

WEIR CALCULATIONS WQ POND D

Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
834	0	0
835	0.29	0
836	0.33	0
837	0.36	0
838	0.38	60
839	0.43	169.71
100 YEAR CFS TO POND D		57.66

Construction Phase - Temporary Sediment Basin D

Elevation [ft]	Area [s.f.]	Avg End Incremental Volume [c.f.]	Avg End Cumulative Volume [c.f.]
834	25	0	0.00
835	12846	6436	6,435.66
836	14219	13532	19,968.10
837	15659	14939	34,906.80
838	16503	16081	50,987.92
839	18741	17622	68,610.11
3,000 Ft^3/Ac		Required =	59,298.00

3

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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 D PLAN

SOMERSET HILLS - PHASES A-E

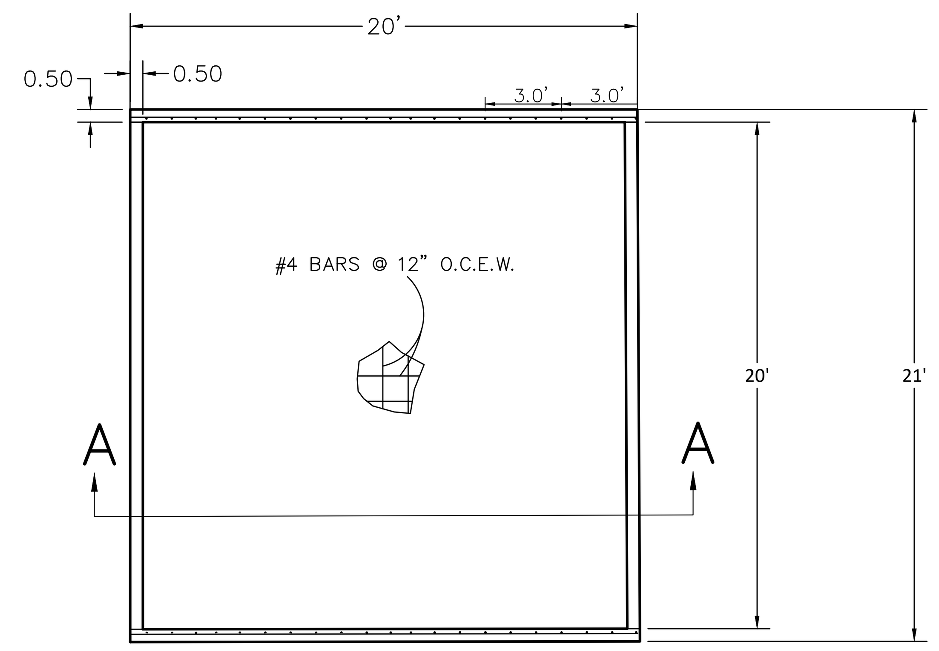
City of Georgetown
Williamson County, Texas

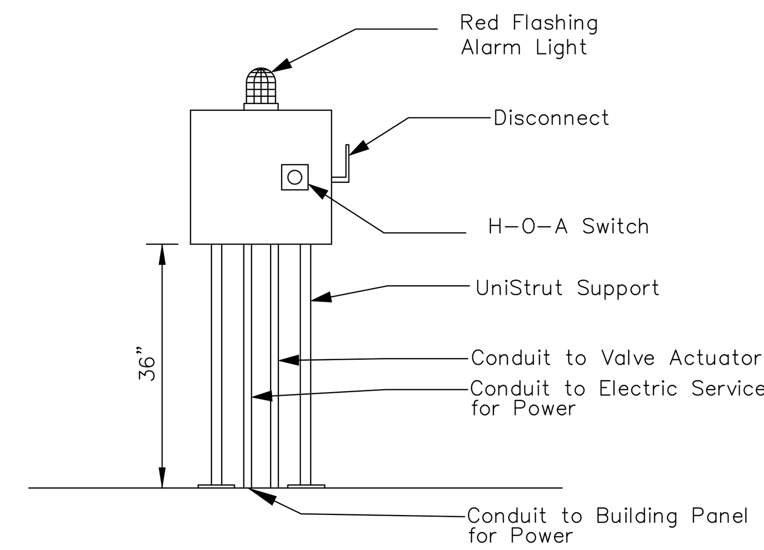
Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.	
Sheet Number:	121 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\121 WATER QUALITY POND D PLAN.dwg By: Kevin Langford Date: 5/7/2024 5:06 PM

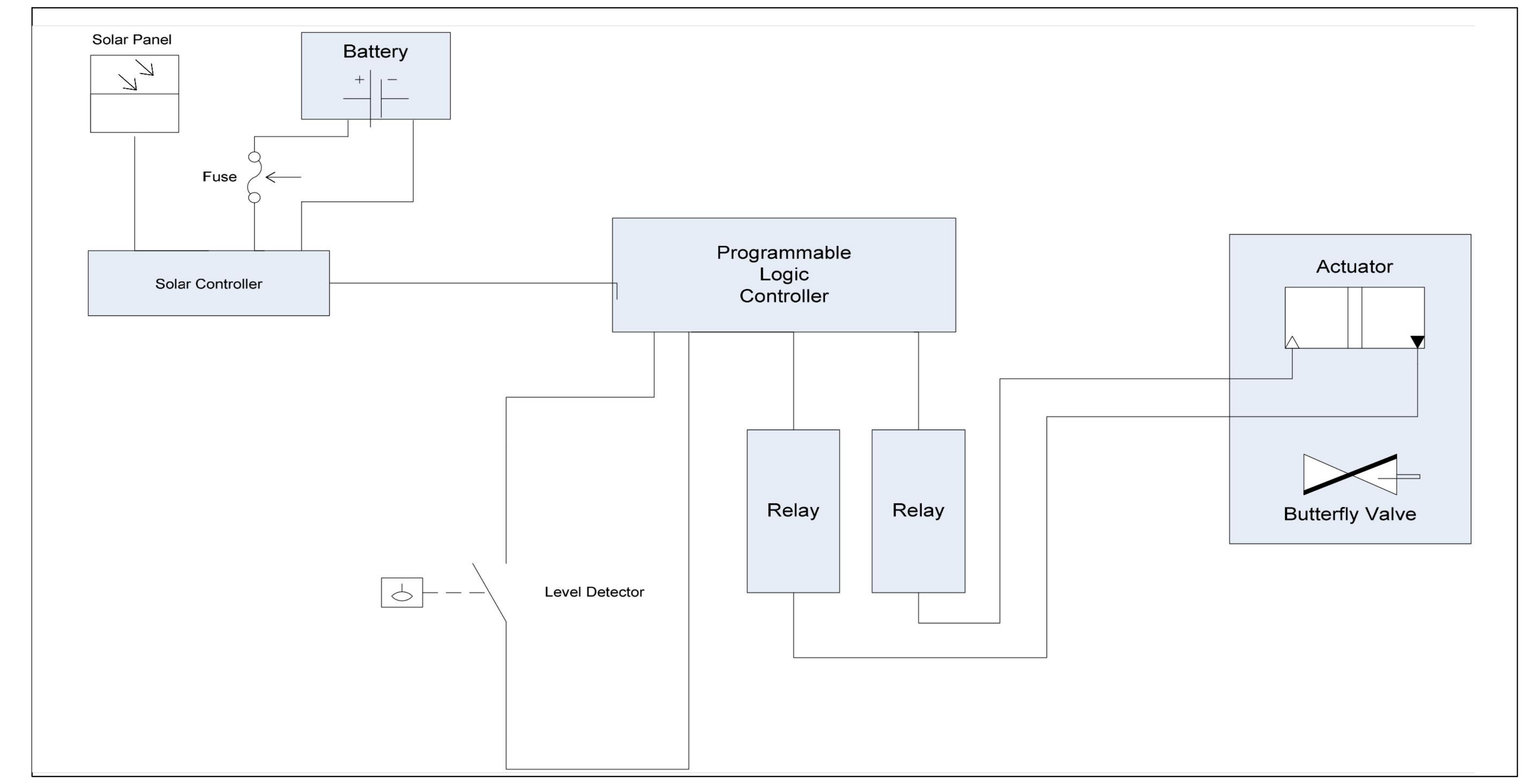
SPILLWAY STRUCTURE FOR BATCH DETENTION BASIN D





CONTROL / ALARM

NTS



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 powdered 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).

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

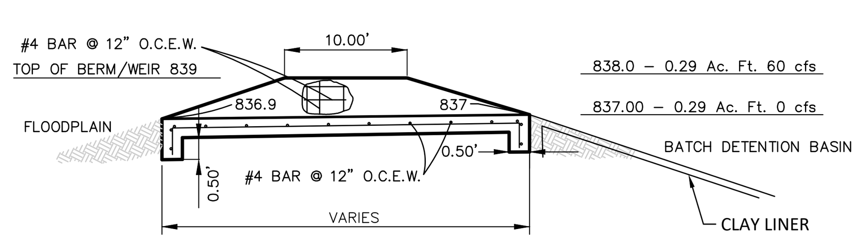
GEOSYNTHETIC CLAY LINERS (GCLS) ARE FACTORY MANUFACTURED HYDRAULIC BARRIERS TYPICALLY CONSISTING OF BENTONITE CLAY OR OTHER VERY LOW PERMEABILITY MATERIAL, SUPPORTED BY GEOTEXTILES AND/OR GEOMEMBRANES WHICH ARE HELD TOGETHER BY NEEDLING, STITCHING, OR CHEMICAL ADHESIVES. THESE LINERS MUST HAVE A HYDRAULIC 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.)

WQ D OUTFALL WEIR PLAN

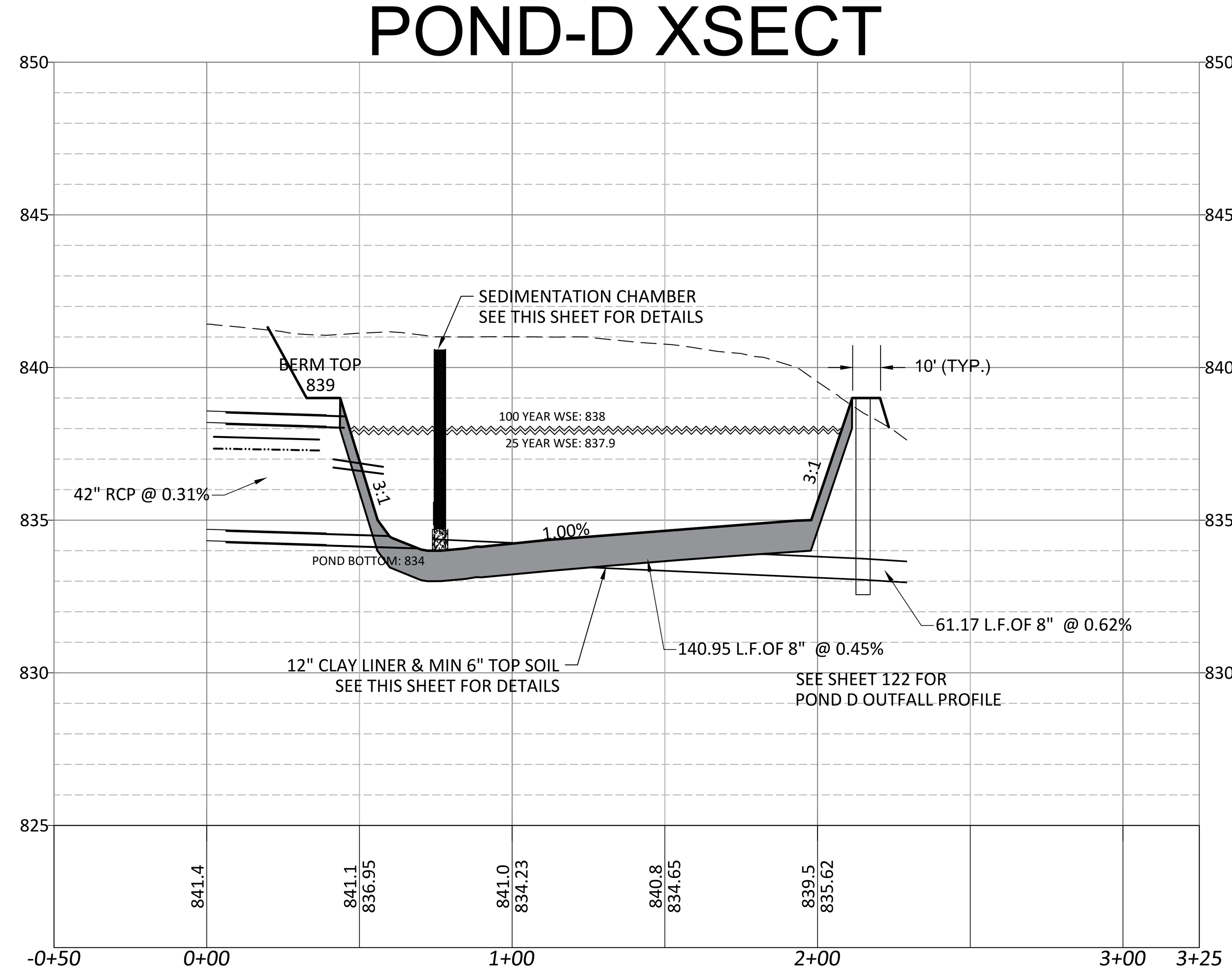
NOT TO SCALE

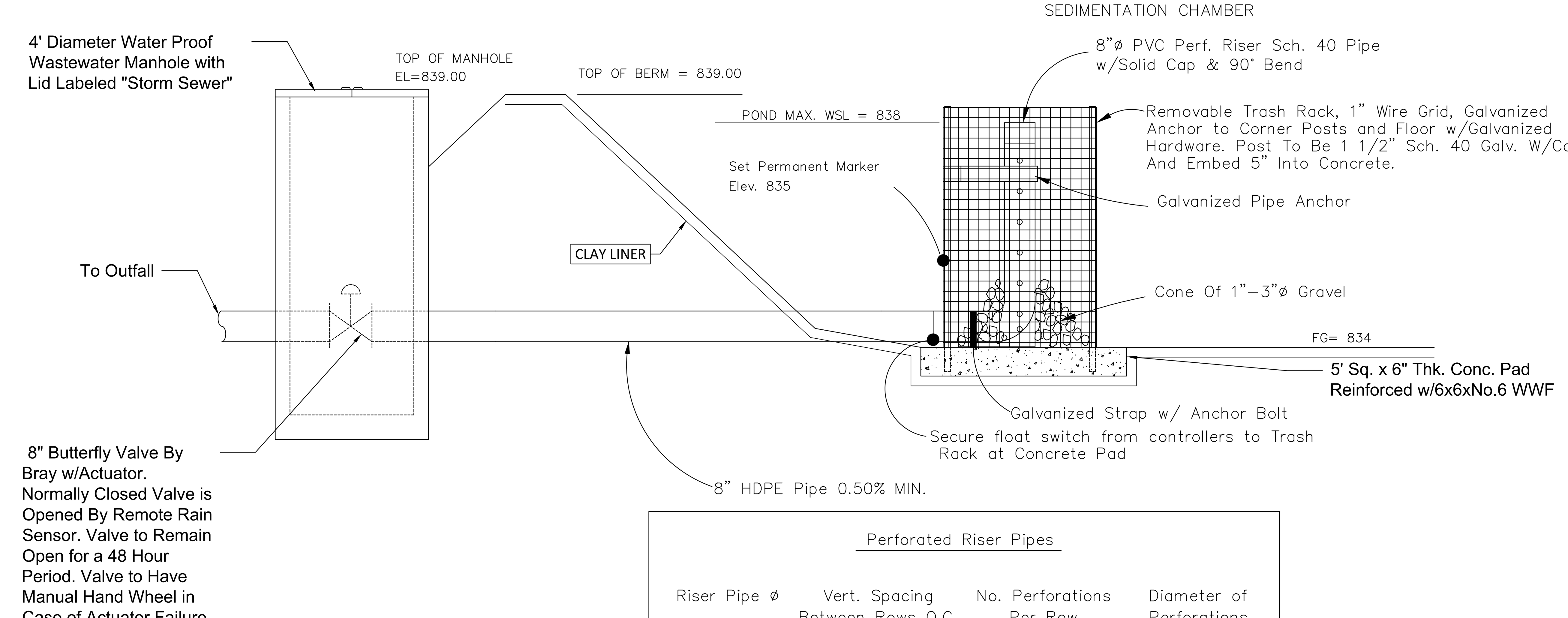


SECTION A-A

SCALE: 1"=3'

POND-D XSECT





Perforated Riser Pipes

Riser Pipe ø	Vert. Spacing Between Rows O.C.	No. Perforations Per Row	Diameter of Perforations
8"	4"	4	1"

SEDIMENTATION RISER PIPE

NTS

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

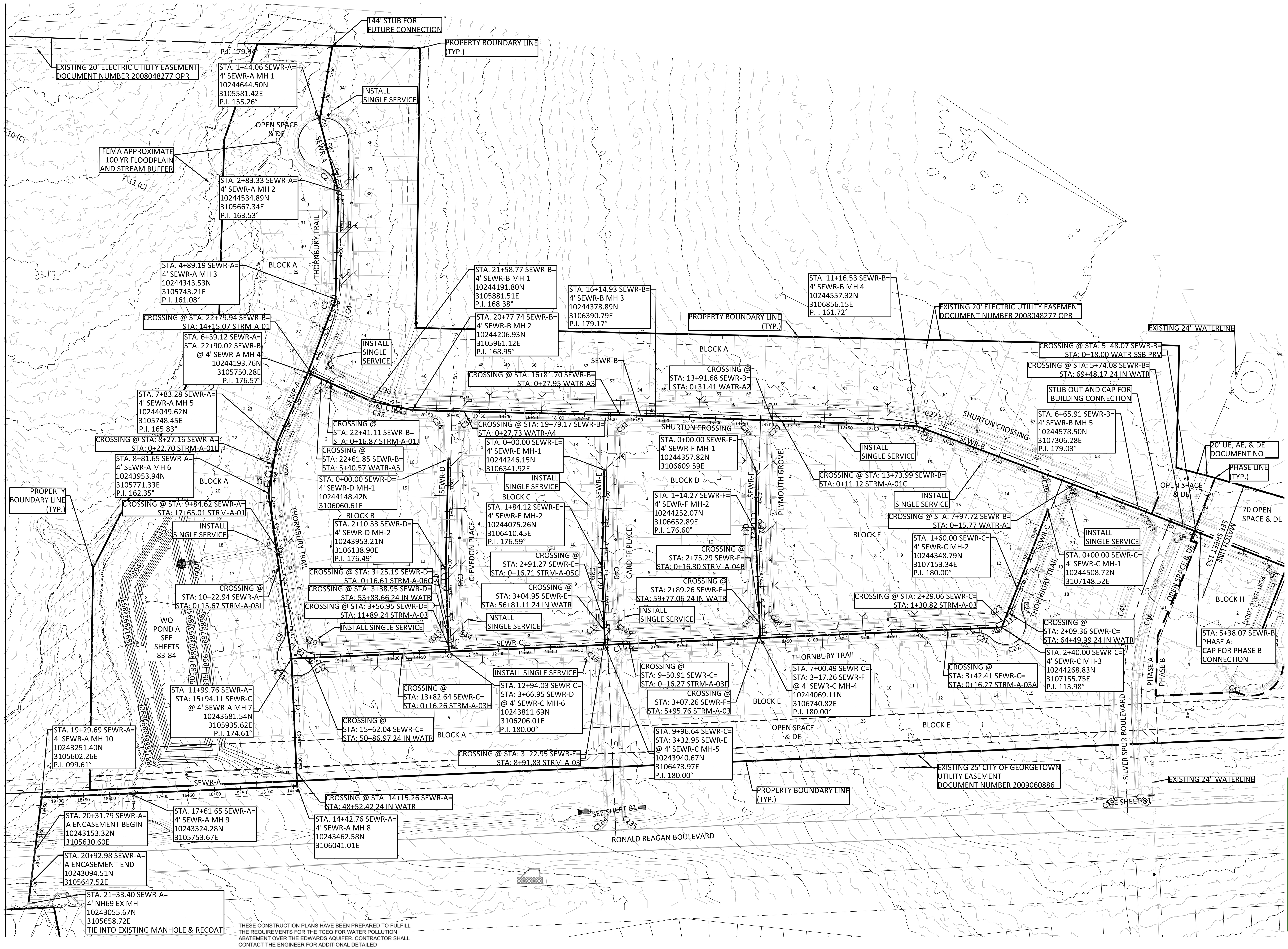
STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED PROFESSIONAL ENGINEER
11/11/21

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 D DETAILS
SOMERSET HILLS PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P\22000-22999 SOMERSET HILLS
Xref DWG FILE.	
Sheet Number:	122 of 218 sheets

2021-21-CON



THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.

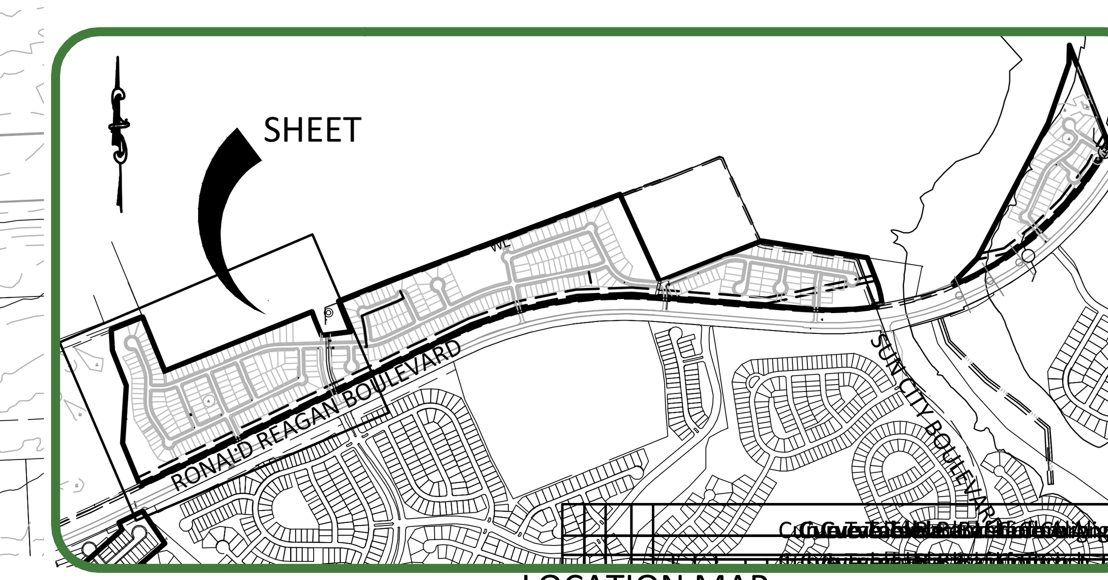
LEGEND

- PROPOSED WATER LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE

* SEE 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 1 year in the amount of 25% 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 on PDF disk (300 dpi).



LOCATION MAP
SCALE = 1":1500'

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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

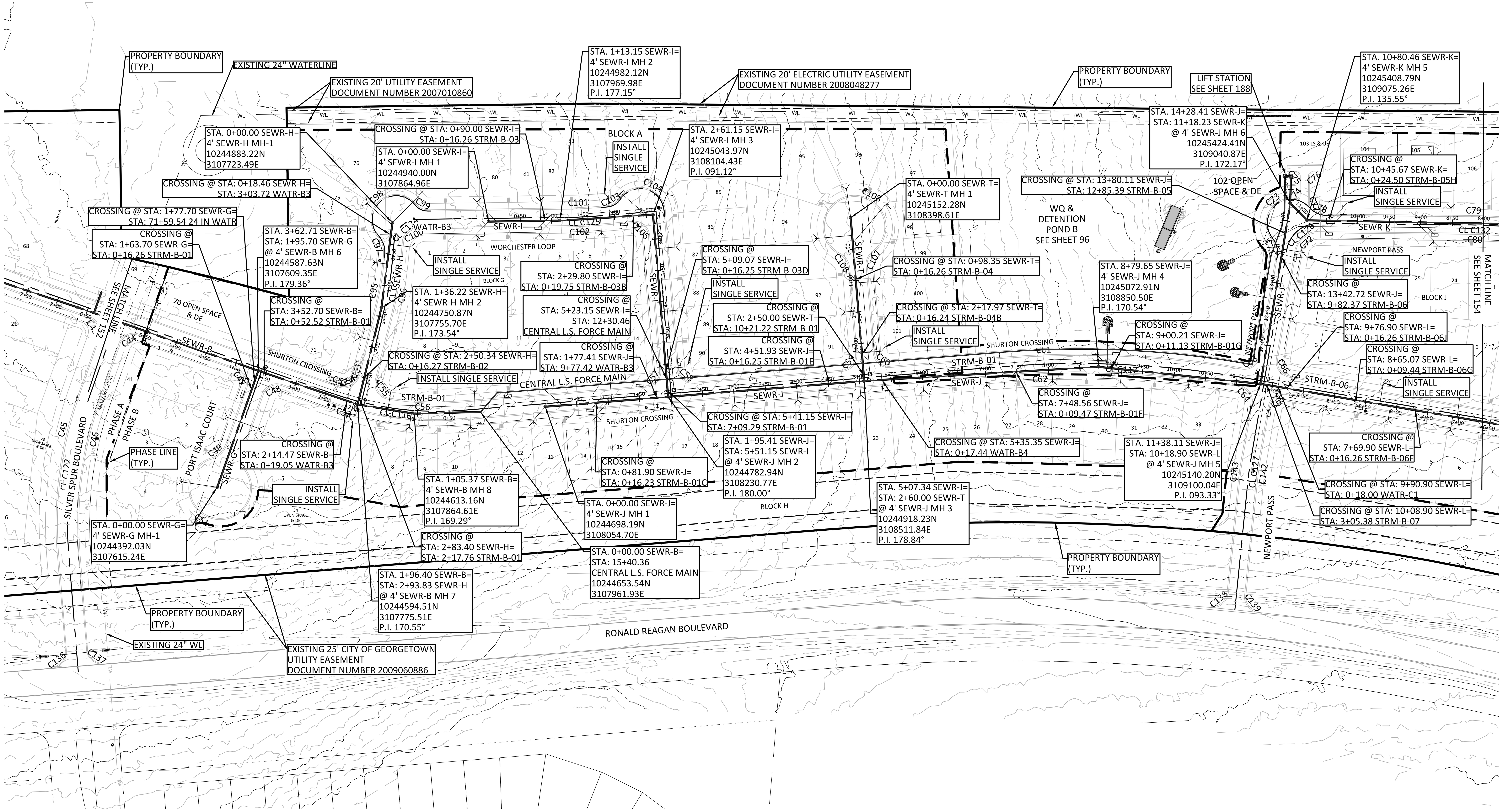
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

PHASE A OVERALL WASTEWATER PLAN

SOMERSET HILLS - PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	152 of 218 sheets



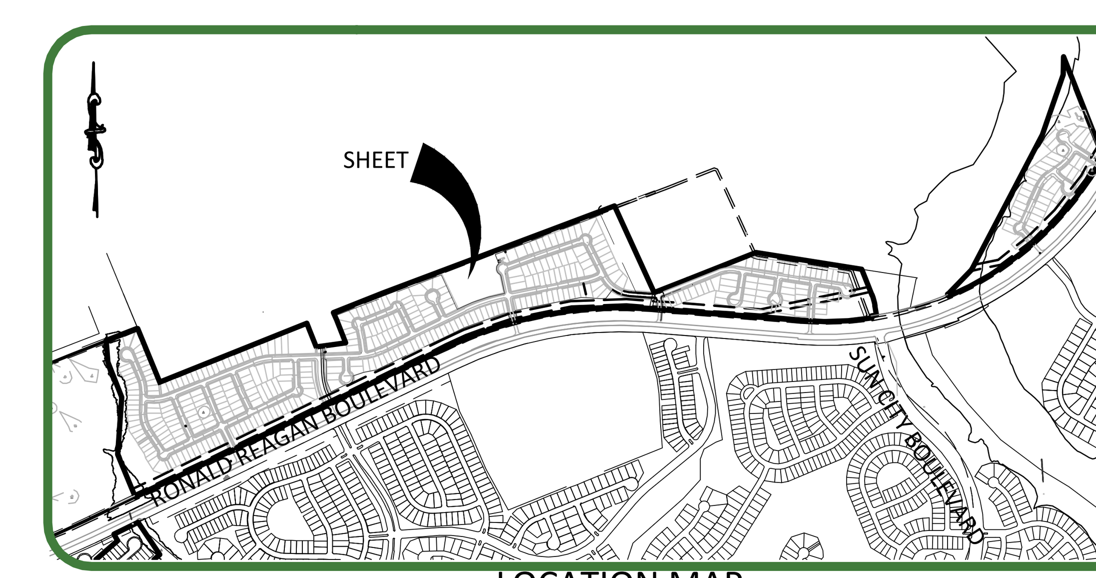
LEGEND

- PROPOSED WATER LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE

* SEE 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 1 year in the amount of 25% 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 on PDF disk (300 dpi).



LOCATION MAP
SCALE = 1":1500'

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/7/2024

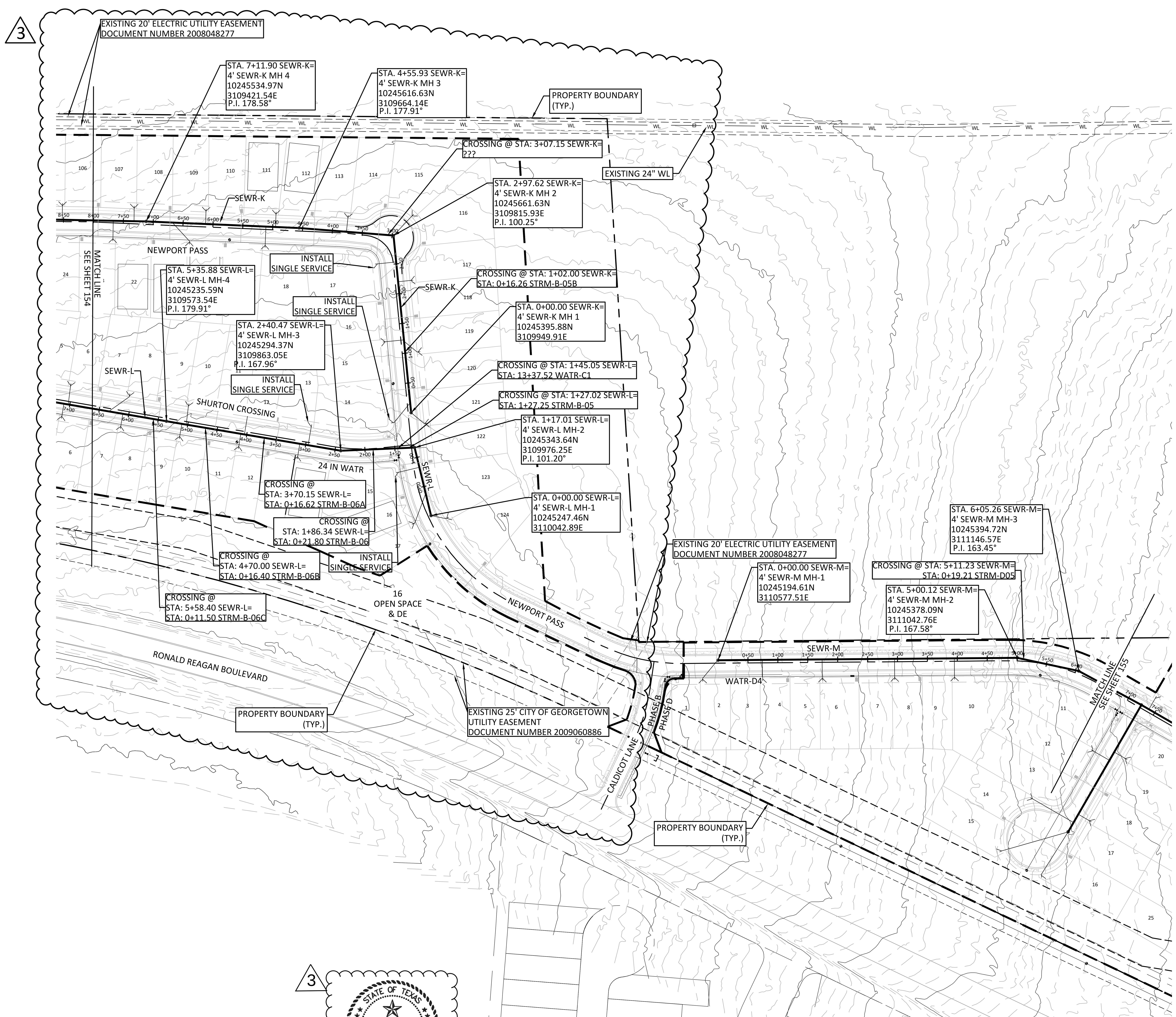
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

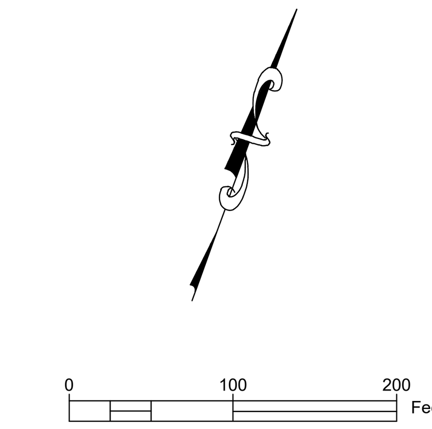
PHASE B OVERALL WASTEWATER PLAN (1 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	153 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\153 PHASE B OVERALL WASTEWATER PLAN (1 OF 2).dwg By: Kevin Langford Date: 5/7/2024 5:13 PM





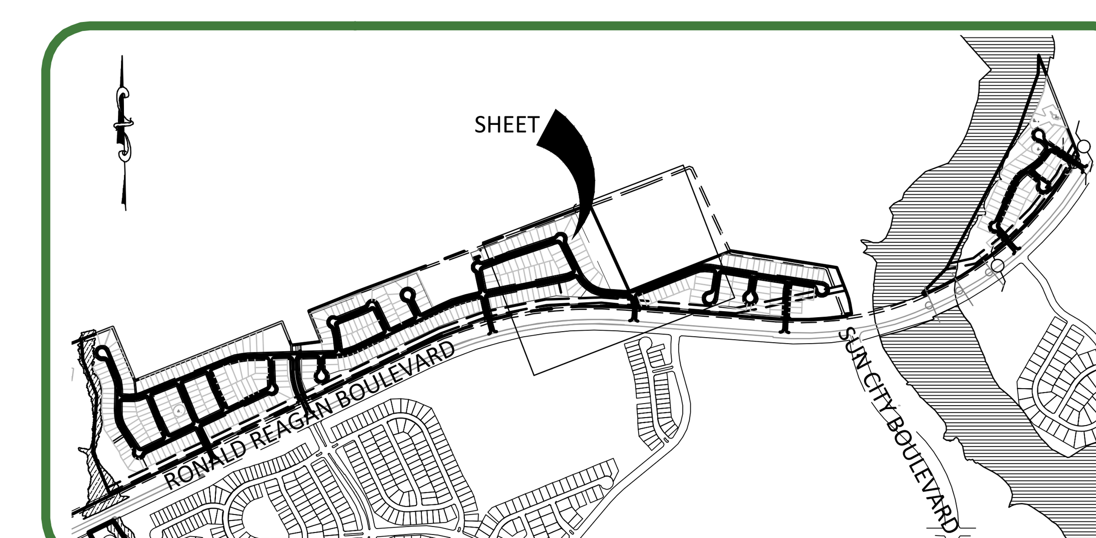
LEGEND

- PROPOSED WATER LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE

* SEE 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 1 year in the amount of 25% 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 on PDF disk (300 dpi).



LOCATION MAP
SCALE = 1":1500'

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.

3
STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

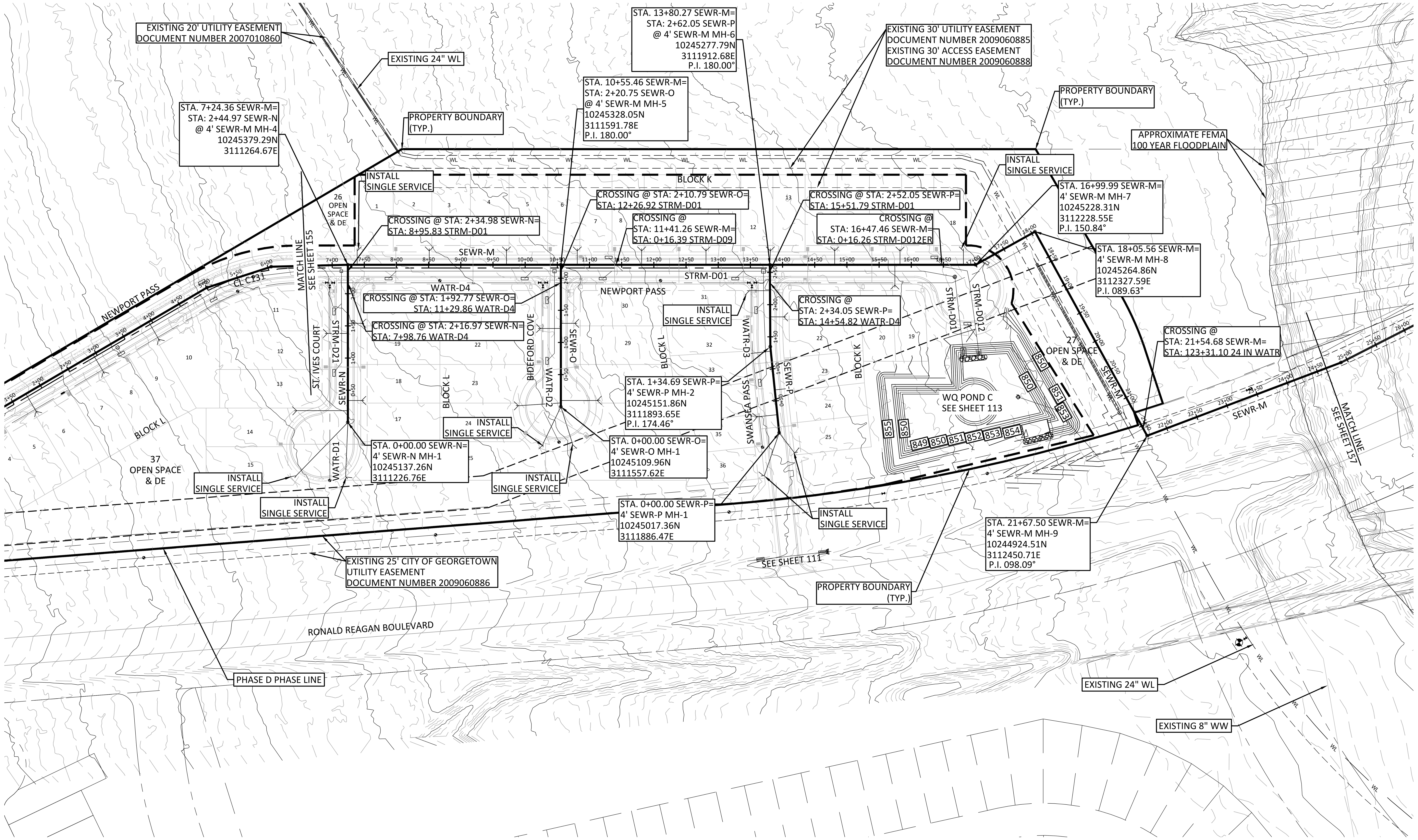
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

PHASE B OVERALL WASTEWATER PLAN (2 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.	
Sheet Number:	154 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\154 PHASE B OVERALL WASTEWATER PLAN (2 OF 2).dwg By: Kevin Langford Date: 5/7/2024 5:18 PM



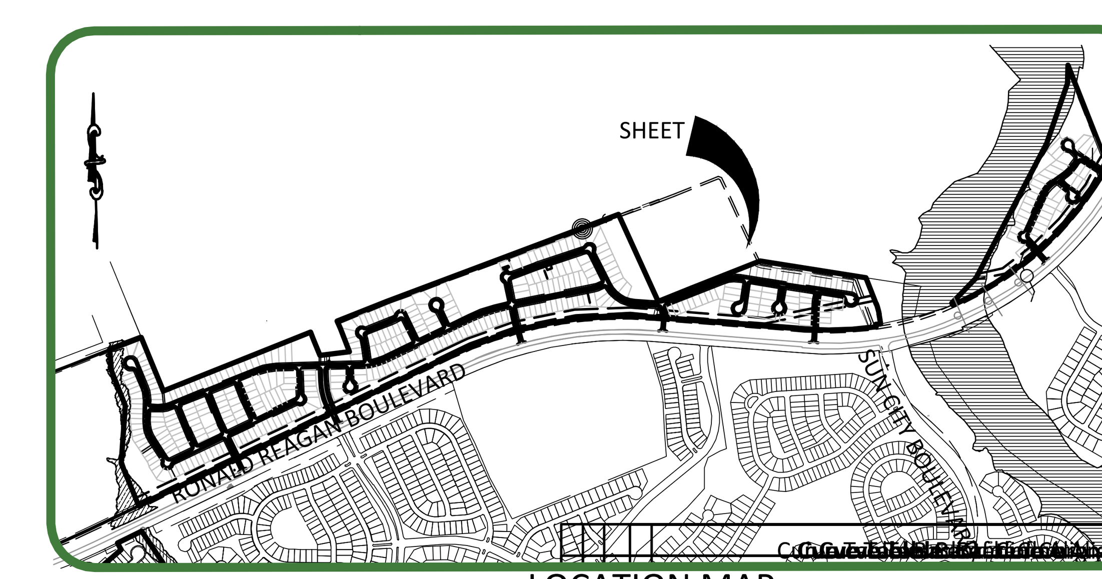
LEGEND

- PROPOSED WATER LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE

* SEE 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 1 year in the amount of 25% 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 on PDF disk (300 dpi).



LOCATION MAP
SCALE = 1":1500'

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

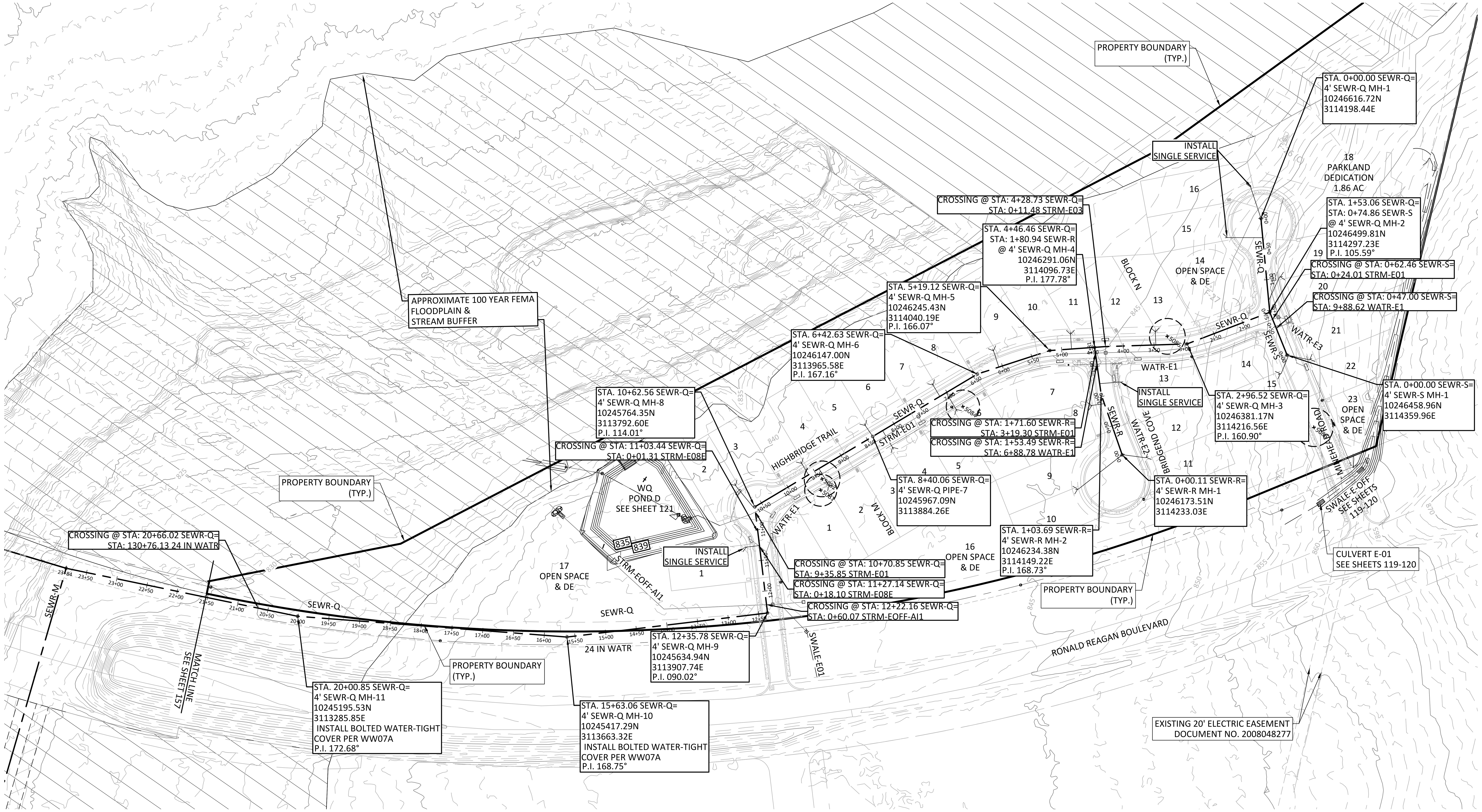
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

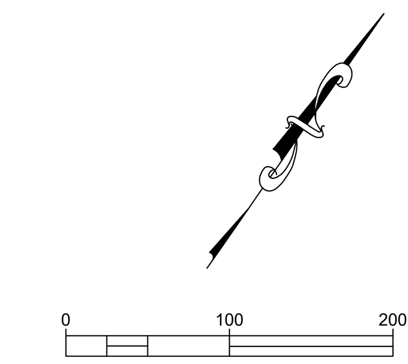
PHASE D OVERALL WASTEWATER PLAN
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	155 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\155 PHASE D OVERALL WASTEWATER PLAN.dwg By: Kevin Langford Date: 5/7/2024 8:20 AM





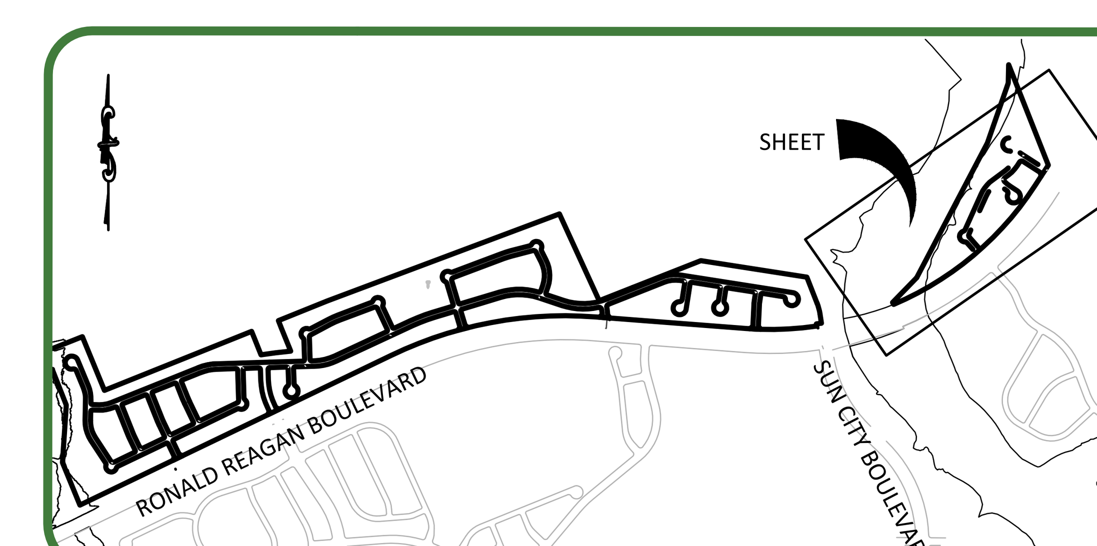
LEGEND

- PROPOSED WATER LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE

* SEE 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 1 year in the amount of 25% 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 on PDF disk (300 dpi).



LOCATION MAP
SCALE = 1":1500'

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

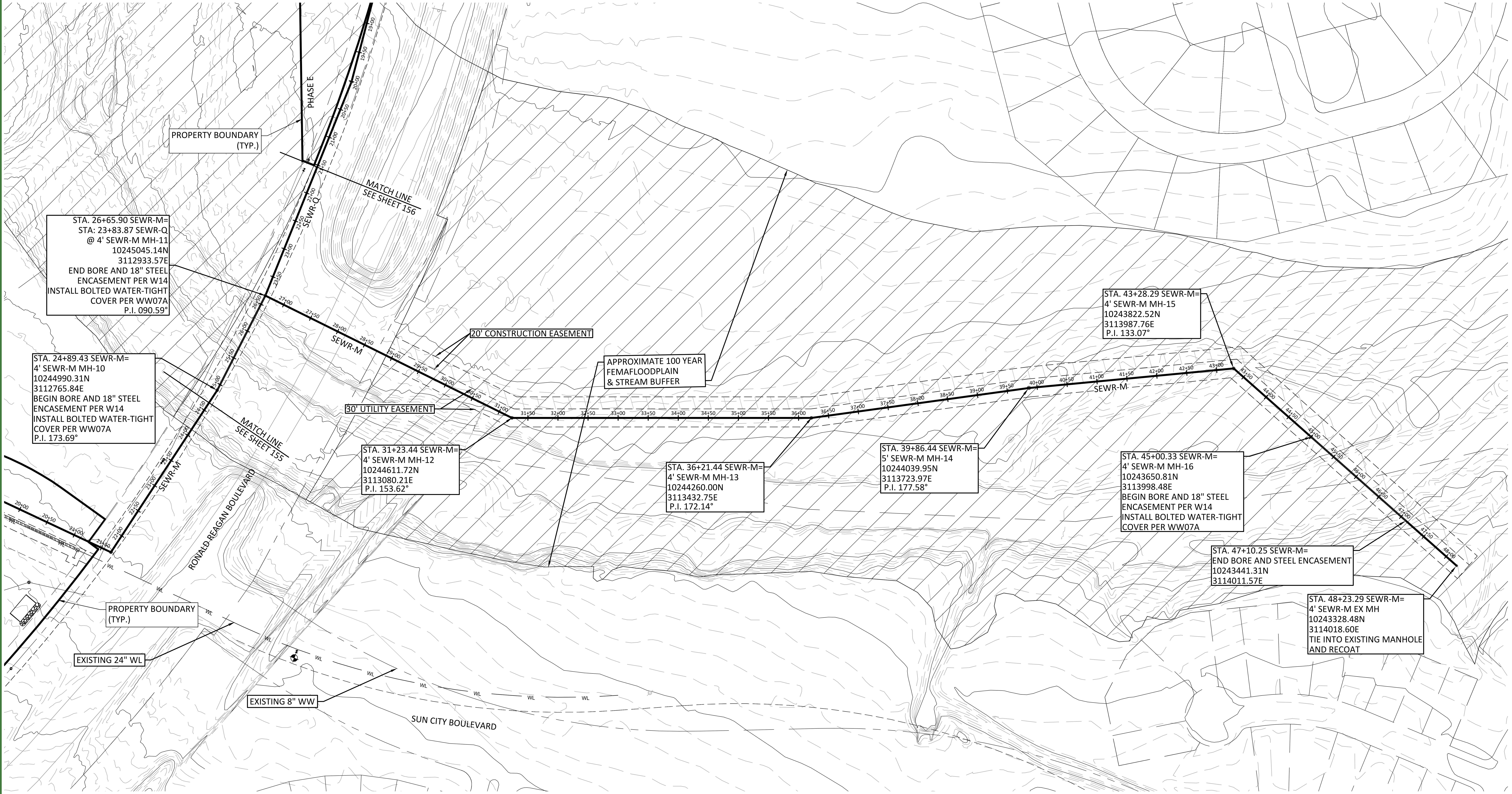
PHASE E OVERALL WASTEWATER PLAN

SOMERSET HILLS PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P:\22000-22999 SOMERSET HILLS
Xref DWG FILE:	
Sheet Number:	156 of 218 sheets

2021-21-CON



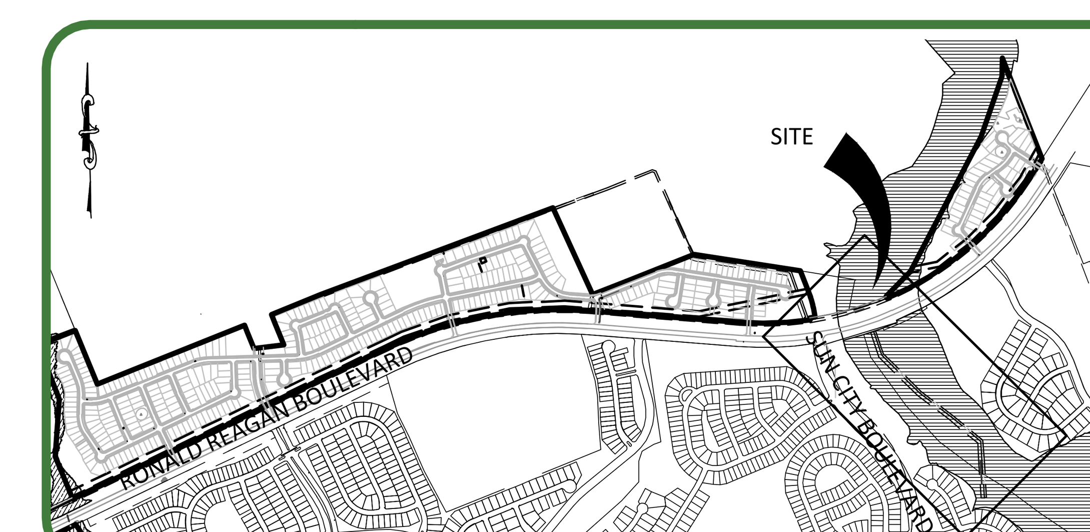
LEGEND

- PROPOSED WATER LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE

* SEE 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 1 year in the amount of 25% 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 on PDF disk (300 dpi).



LOCATION MAP
SCALE = 1":1500'

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED PROFESSIONAL ENGINEER
11/11/21

STEGER BIZZELL

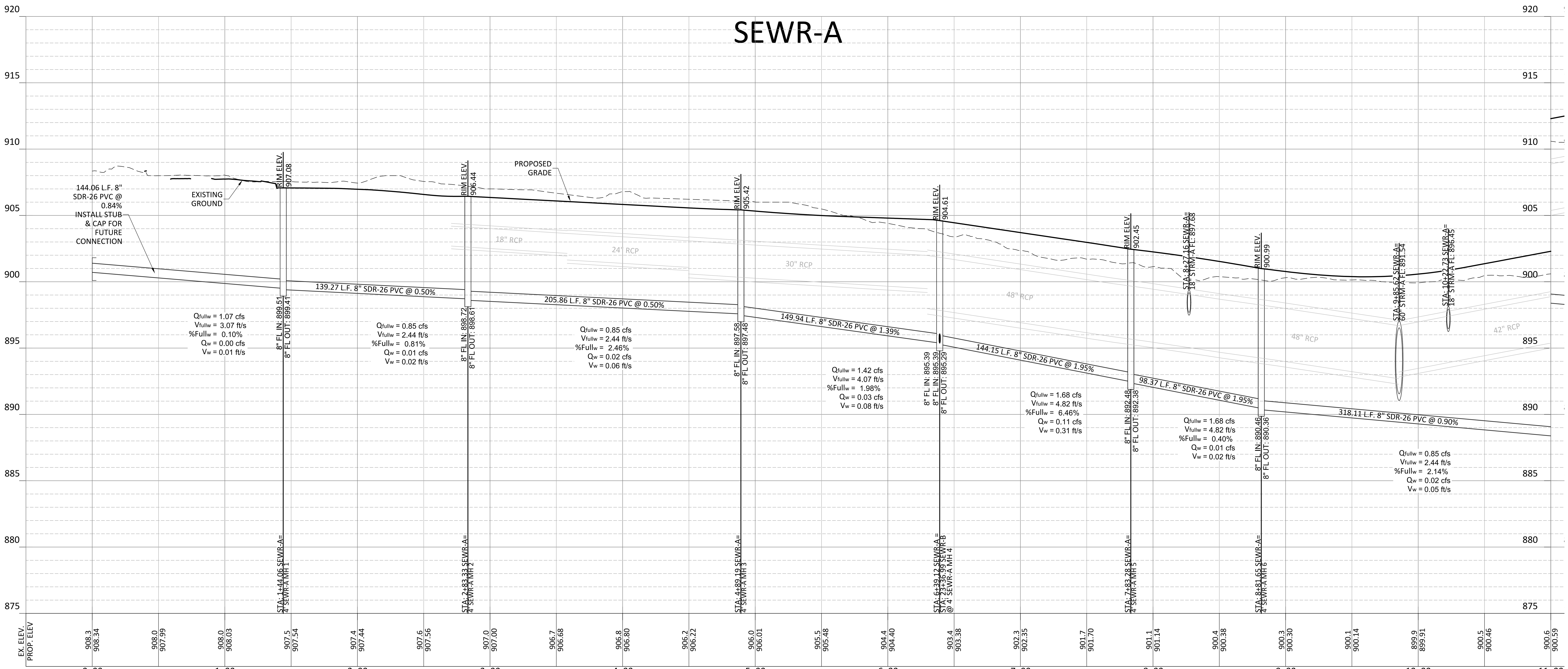
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

OFFSITE OVERALL WASTEWATER PLAN
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.	
Sheet Number:	157 of 218 sheets

2021-21-CON

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

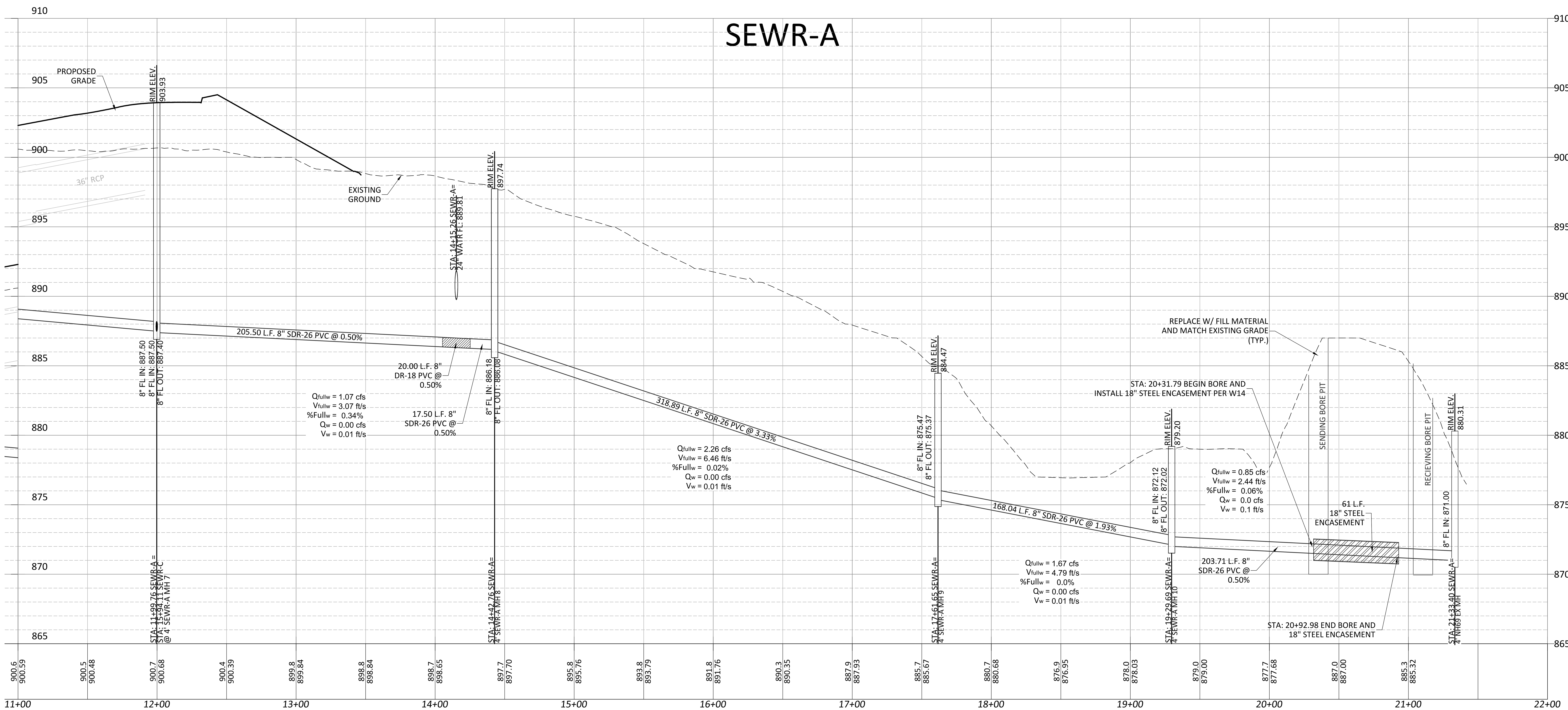
SEWR-A PROFILE (1 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	158 of 218 sheets

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\158 SEWR-A PROFILE (1 OF 2).dwg By: Kevin Langford Date: 5/7/2024 1:00 PM

2021-21-CON

3



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

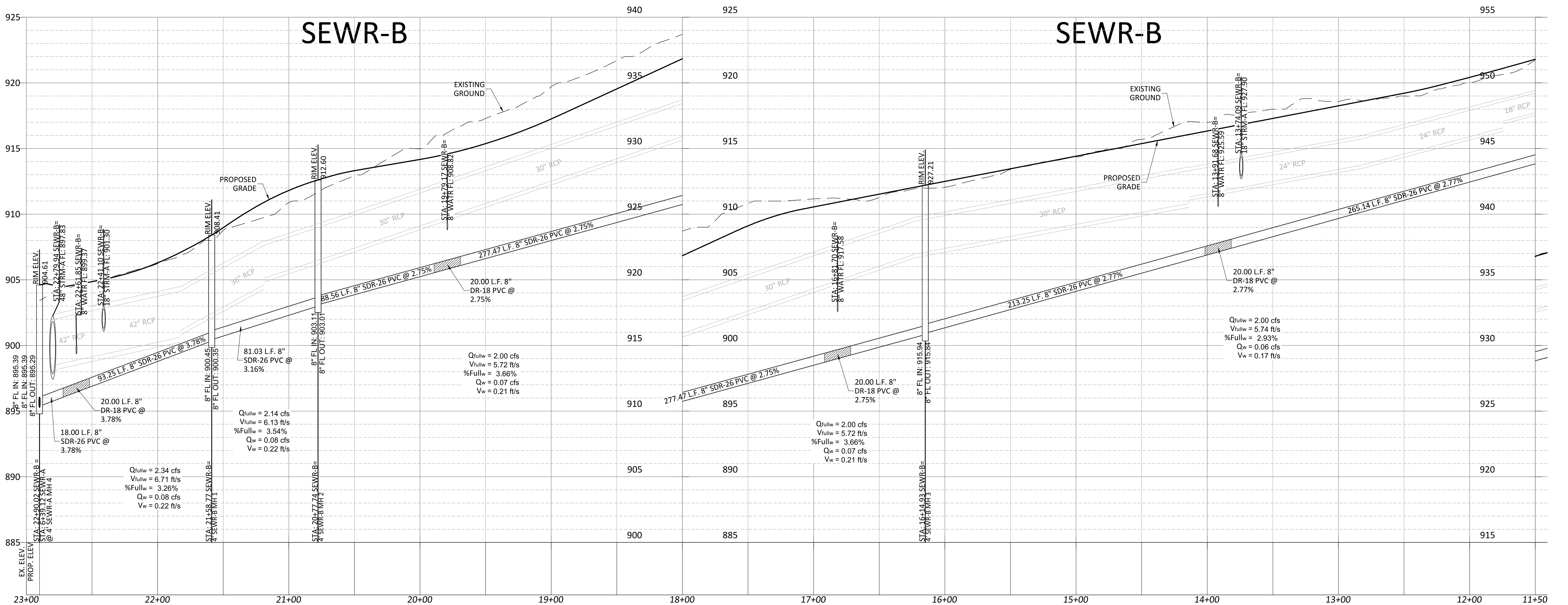
SEWR-A PROFILE (2 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.
Sheet Number: 159 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\159 SEWR-A PROFILE (2 OF 2).dwg By: Kevin Langford Date: 5/7/2024 1:01 PM

3



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

SEWR-B PROFILE (1 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	160 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\160 SEWR-B PROFILE (1 OF 2).dwg By: Kevin Langford Date: 5/7/2024 1:01 PM

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/7/2024

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

SEWR-B PROFILE (2 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	161 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\161 SEWR-B PROFILE (2 OF 2).dwg By: Kevin Langford Date: 5/6/2024 5:15 PM

SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

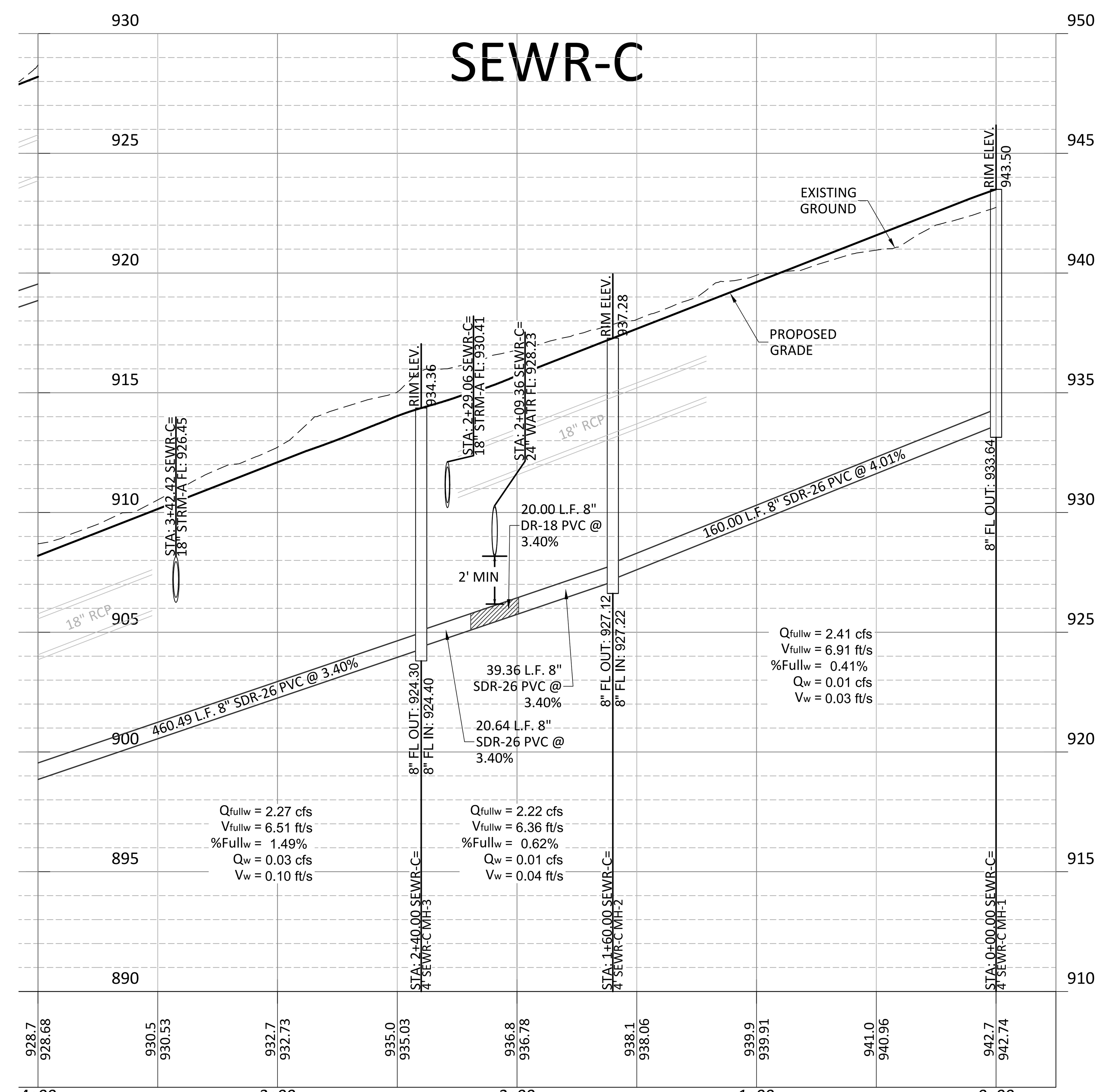
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

SEWR-C PROFILE (1 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	162 of 218 sheets

2021-21-CON

SEWR-C



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/7/2024

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

SEWR-C PROFILE (2 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

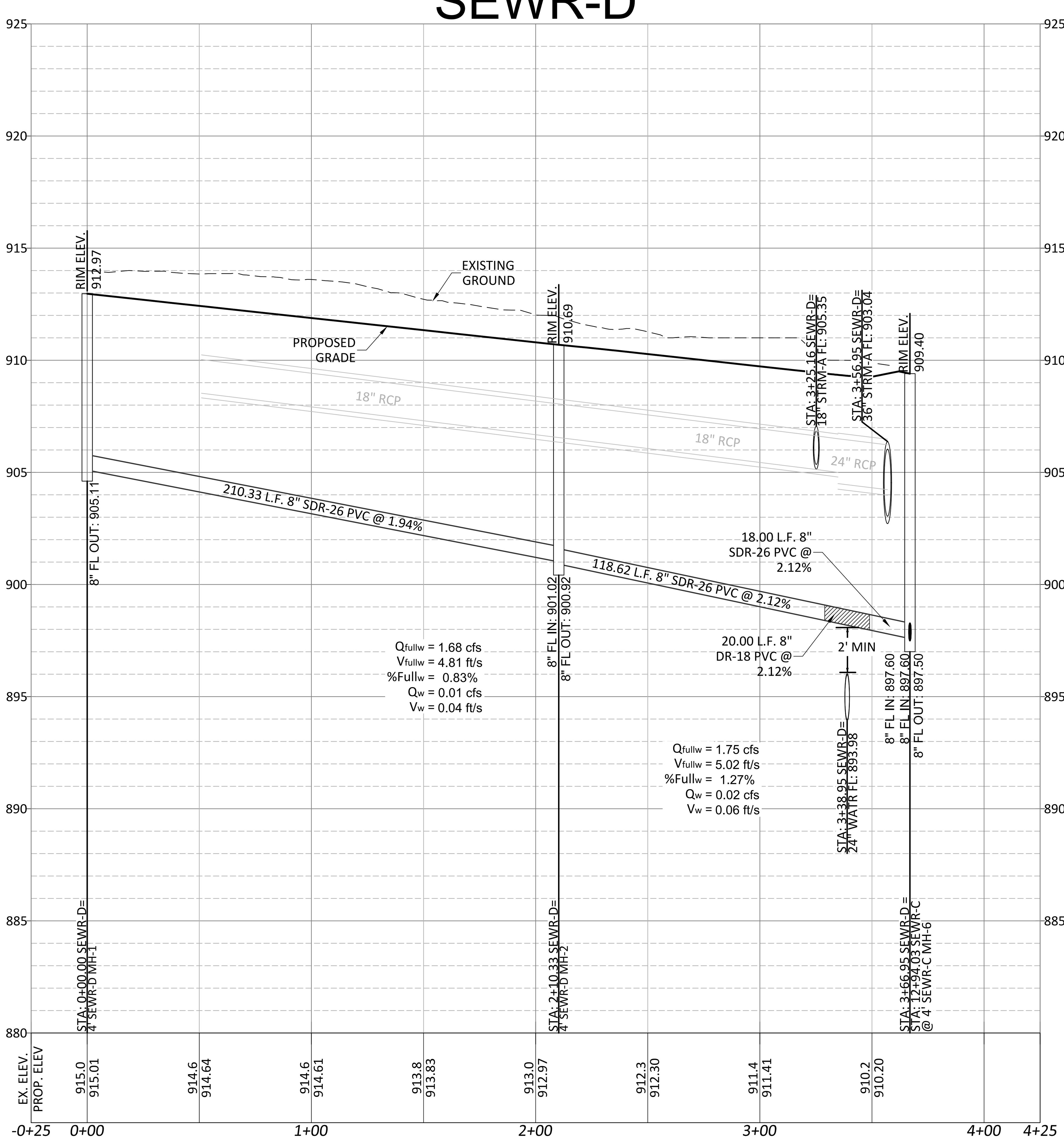
Project Number: 22226x
SCALE: AS NOTED
Project Path: P:\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:
Sheet Number: 163 of 218 sheets

2021-21-CON

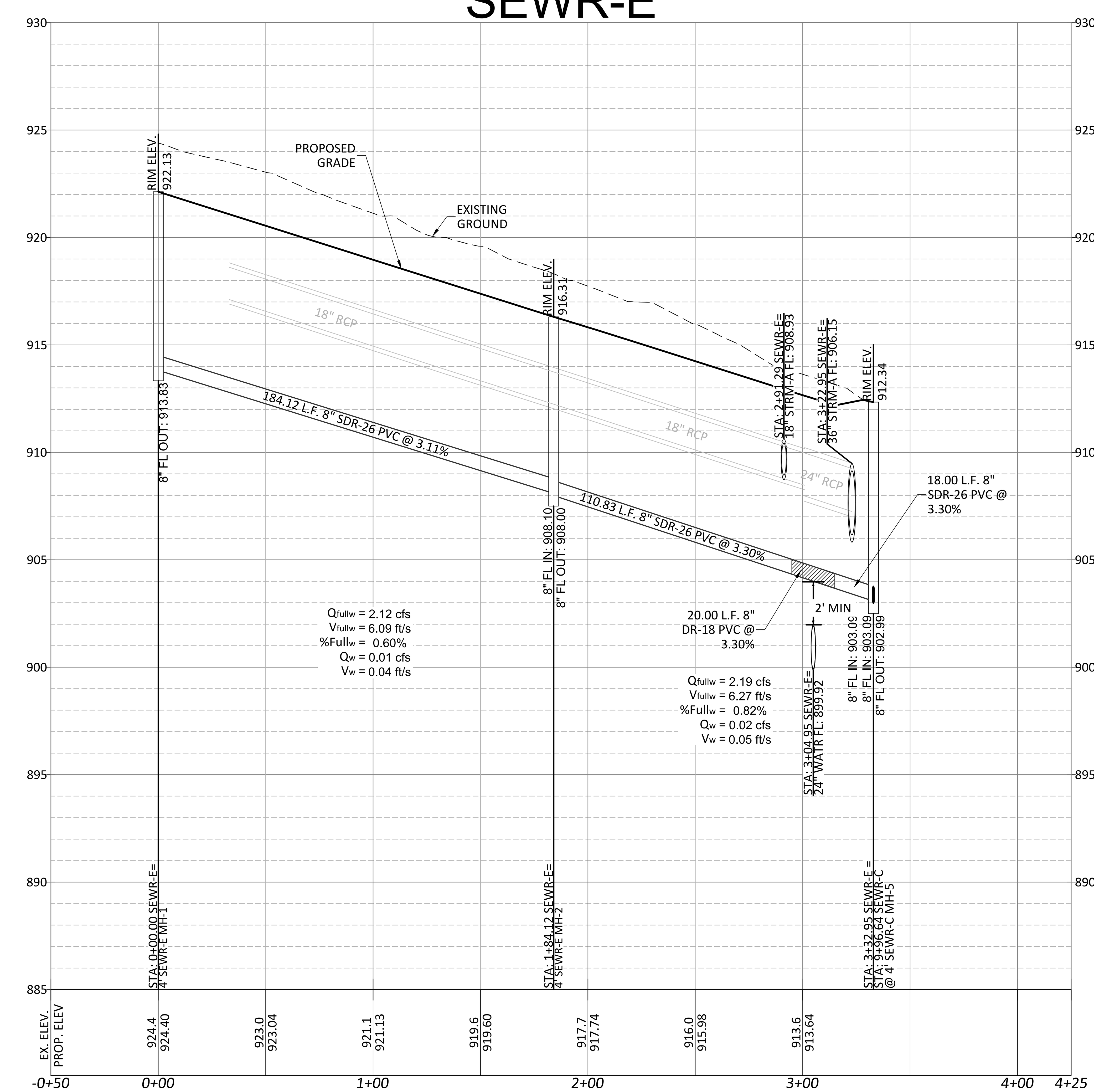
File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\163 SEWR-C PROFILE (2 OF 2).dwg By: Kevin Langford Date: 5/7/2024 1:10 PM

3

SEWR-D



SEWR-E



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

SEWR-D & SEWR-E PROFILE
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

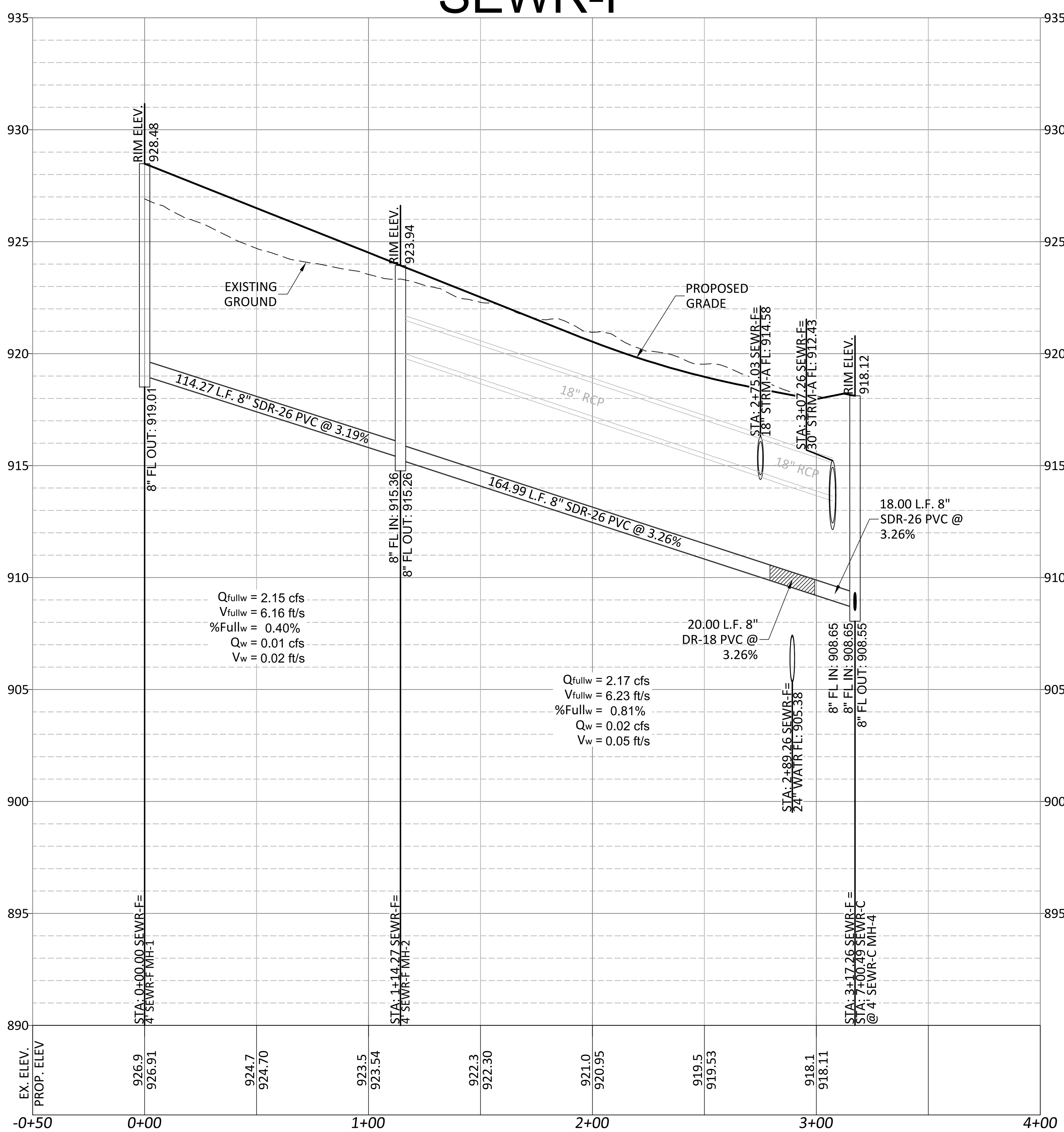
Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	164 of 218 sheets

2021-21-CON

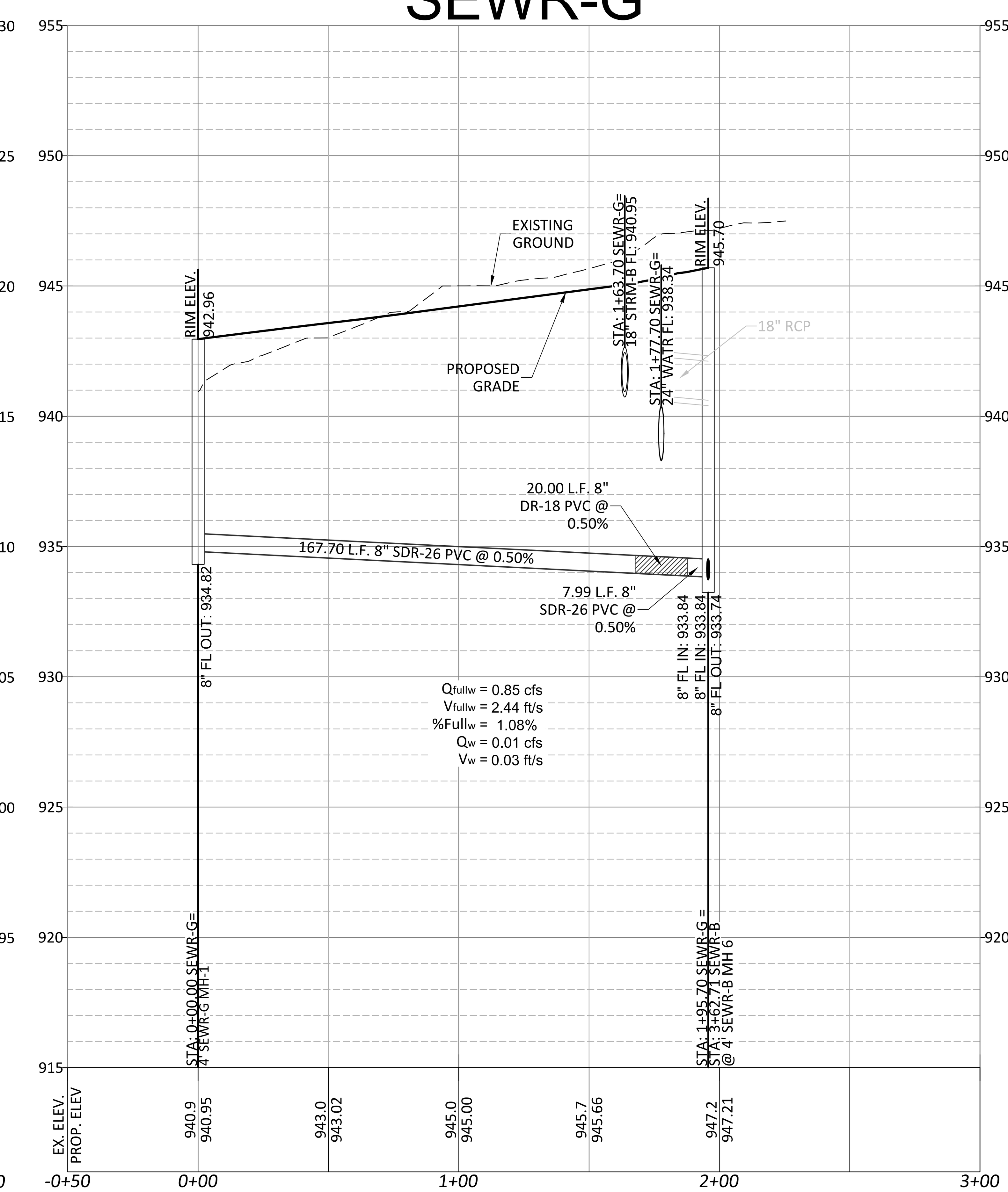
File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\164 SEWR-D & SEWR-E PROFILE.dwg By: Kevin Langford Date: 5/7/2024 1:11 PM

3

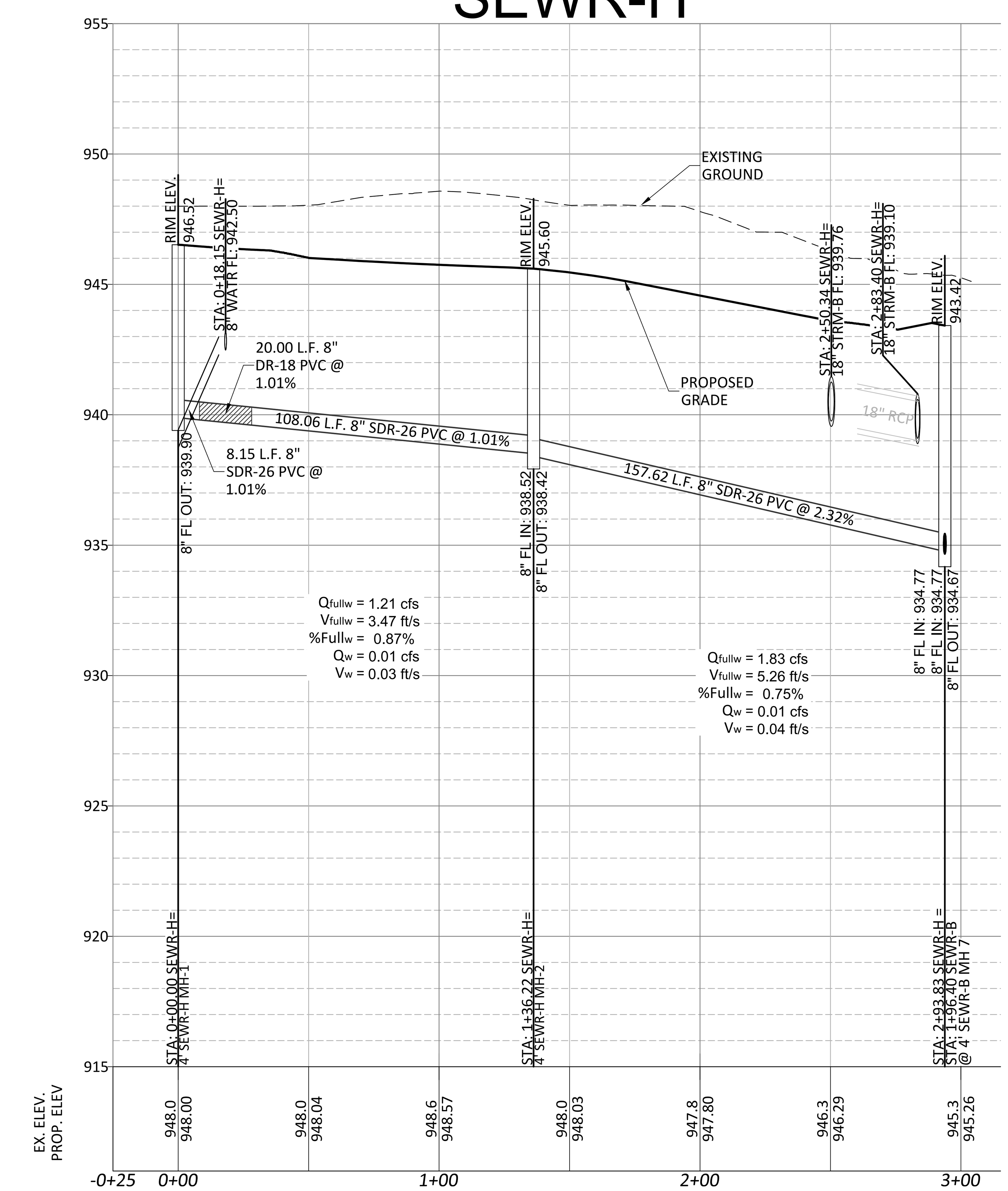
SEWR-F



SEWR-G



SEWR-H



THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

SEWR-F SEWR-G & SEWR-H PROFILE

SOMERSET HILLS - PHASES A-E

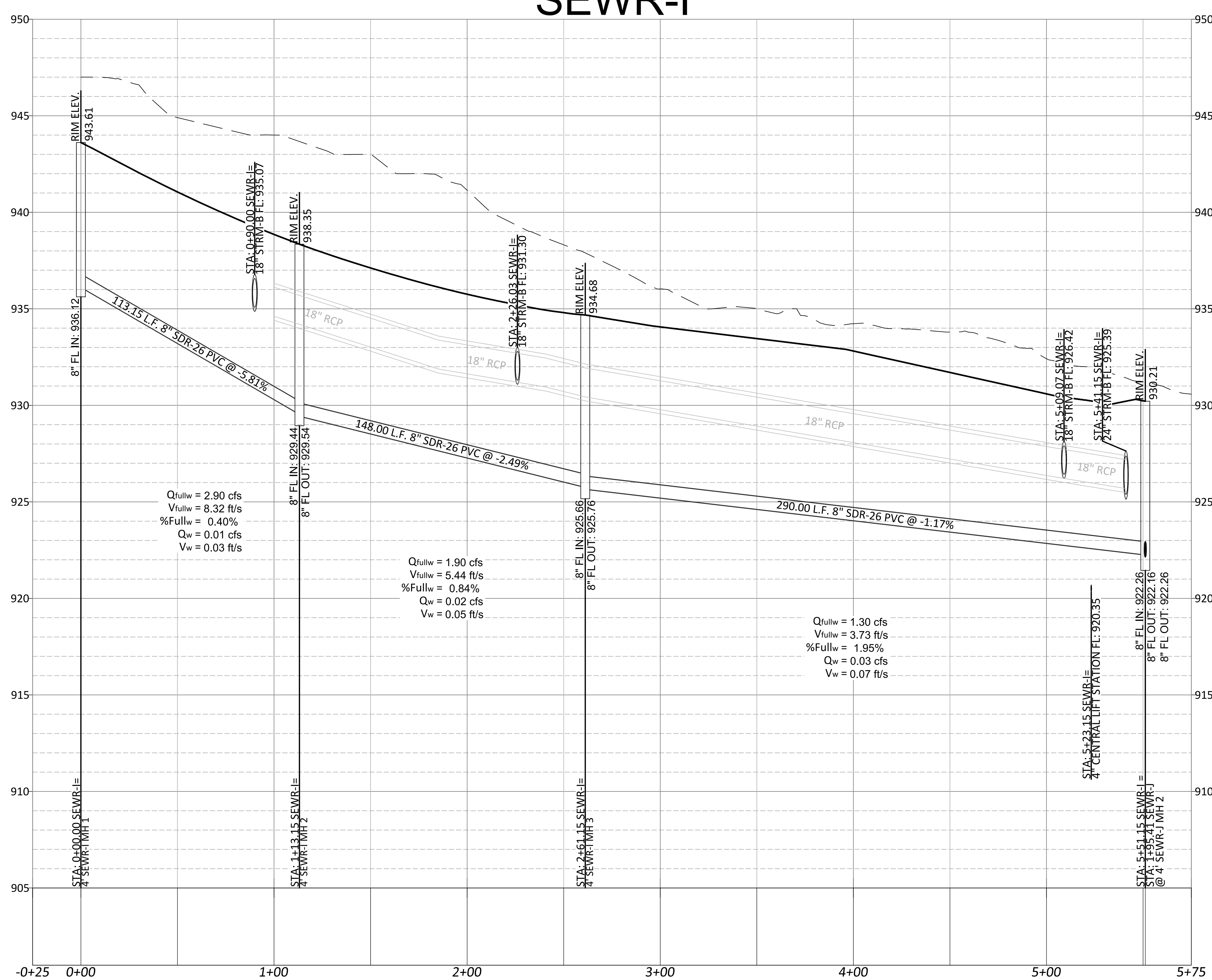
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	165 of 218 sheets

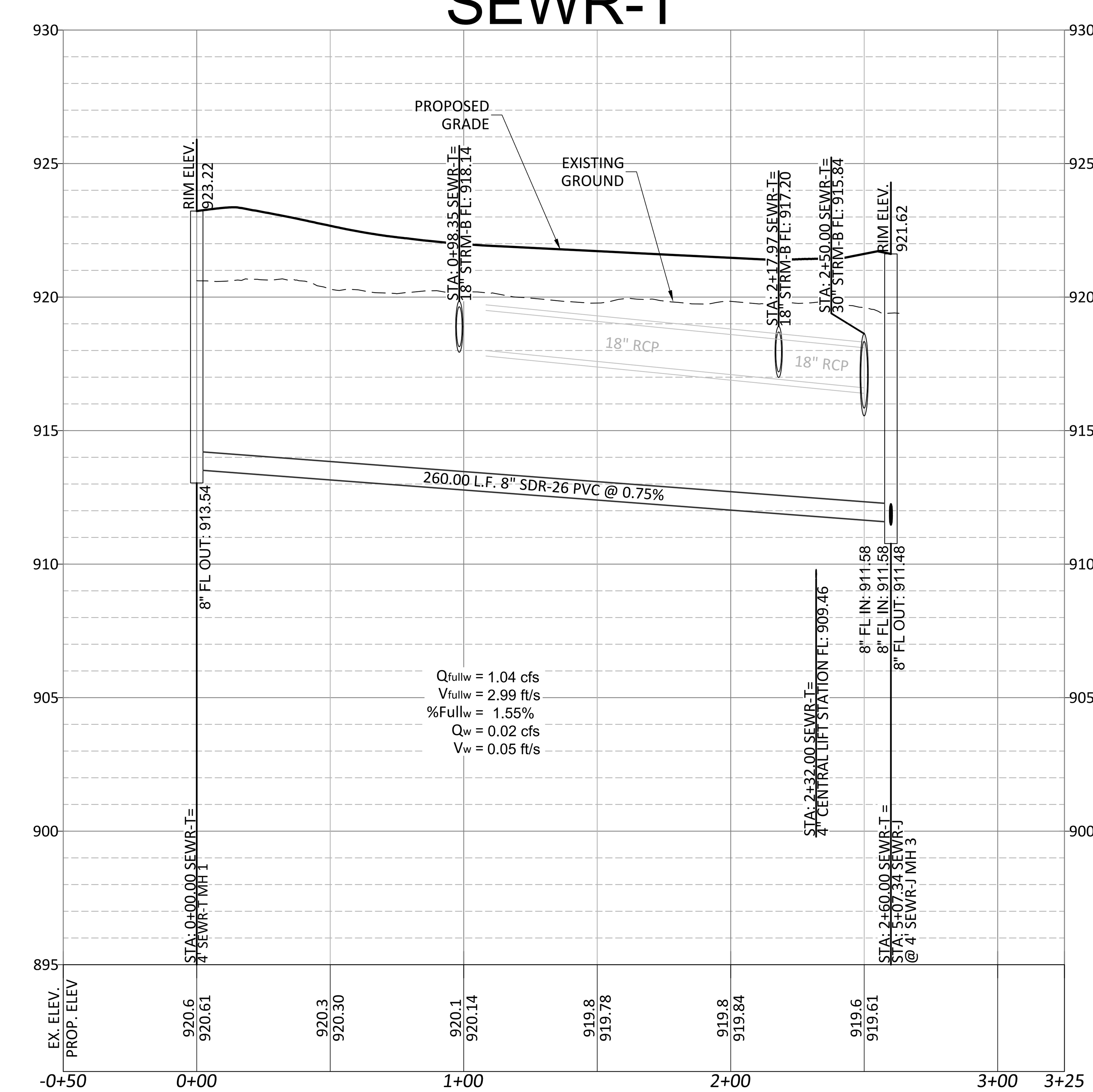
2021-21-CON

3

SEWR-I



SEWR-T



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

SEWR-I & SEWR-T PROFILE
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

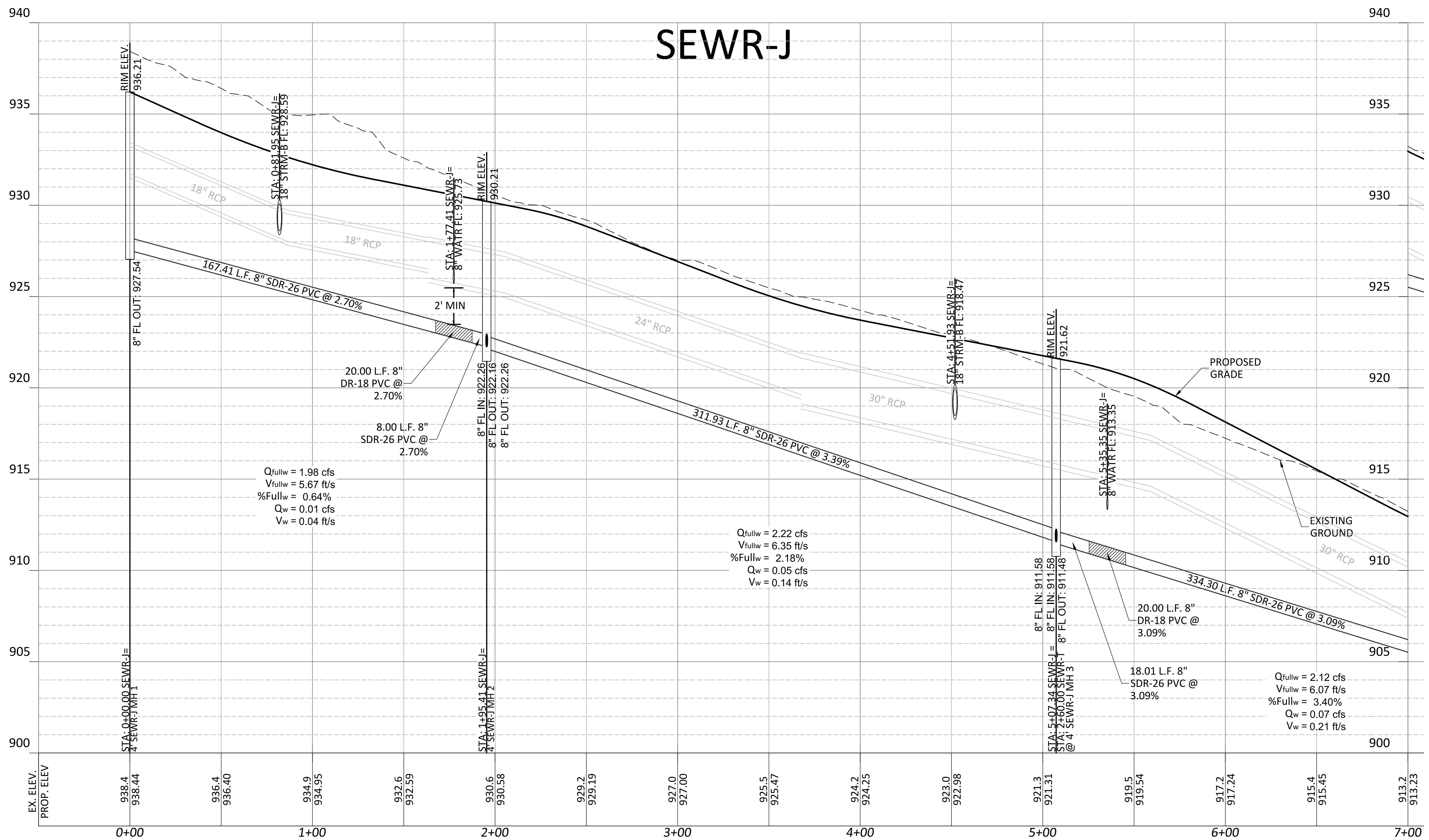
Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	166 of 218 sheets

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\166 SEWR-I & SEWR-T PROFILE.dwg By: Kevin Langford Date: 5/7/2024 1:14 PM

2021-21-CON

3

These drawings are the sole property of STEGER & BIZZELL ENGINEERING, INC. The use of these drawings is hereby restricted to the original site for which they were prepared. Reproduction or reuse of these drawings in whole or in part without written permission of STEGER & BIZZELL ENGINEERING, INC. is strictly prohibited.



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

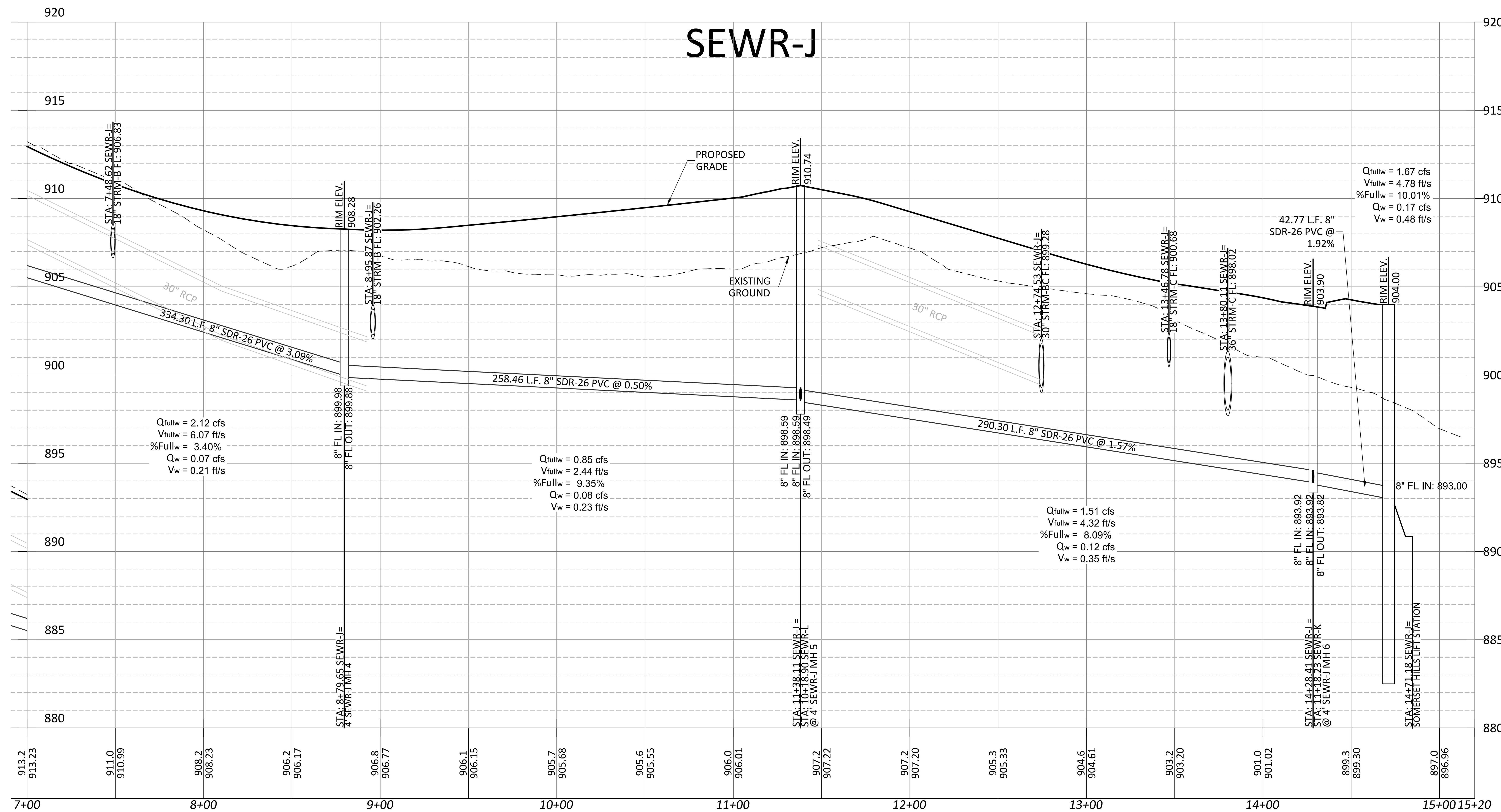
SEWR-J PROFILE (1 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE.	
Sheet Number:	167 of 218 sheets

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\167 SEWR-J PROFILE (1 OF 2).dwg By: Kevin Langford Date: 5/7/2024 1:14 PM

2021-21-CON

3



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/7/2024

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

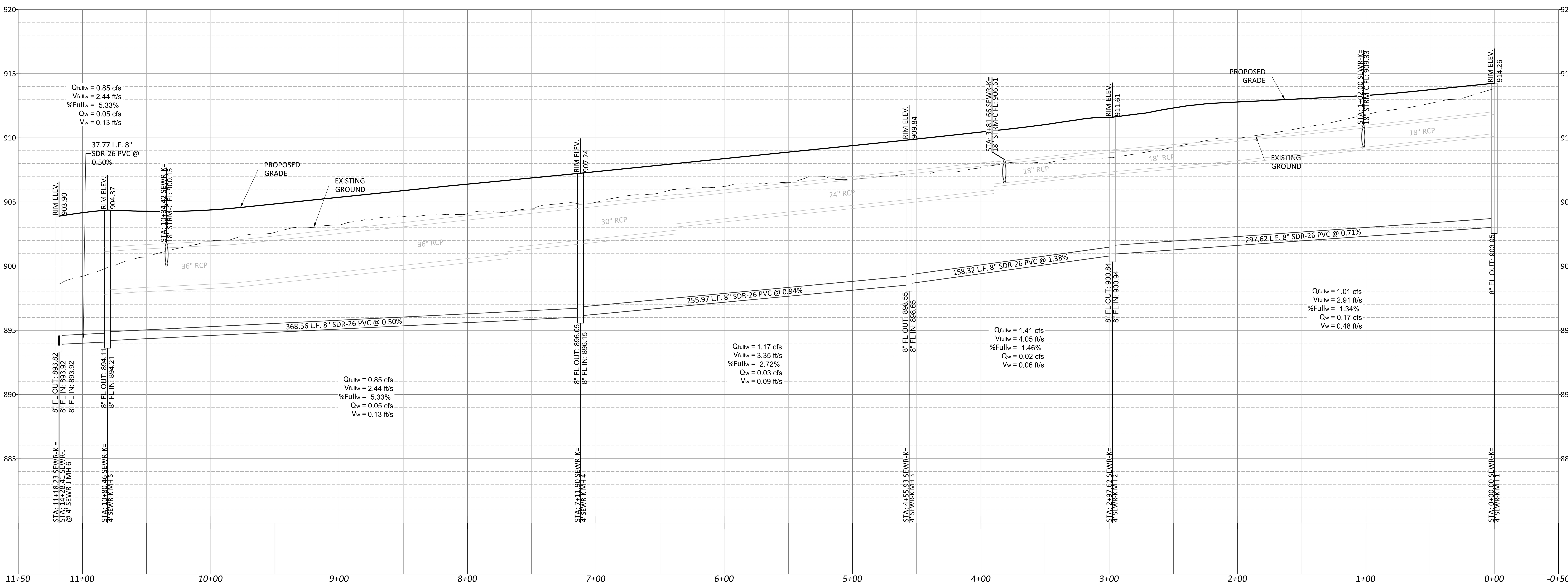
SEWR-J PROFILE (2 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	168 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\168 SEWR-J PROFILE (2 OF 2).dwg By: Kevin Langford Date: 5/7/2024 1:15 PM

SEWR-K



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED PROFESSIONAL ENGINEER
5/7/2024

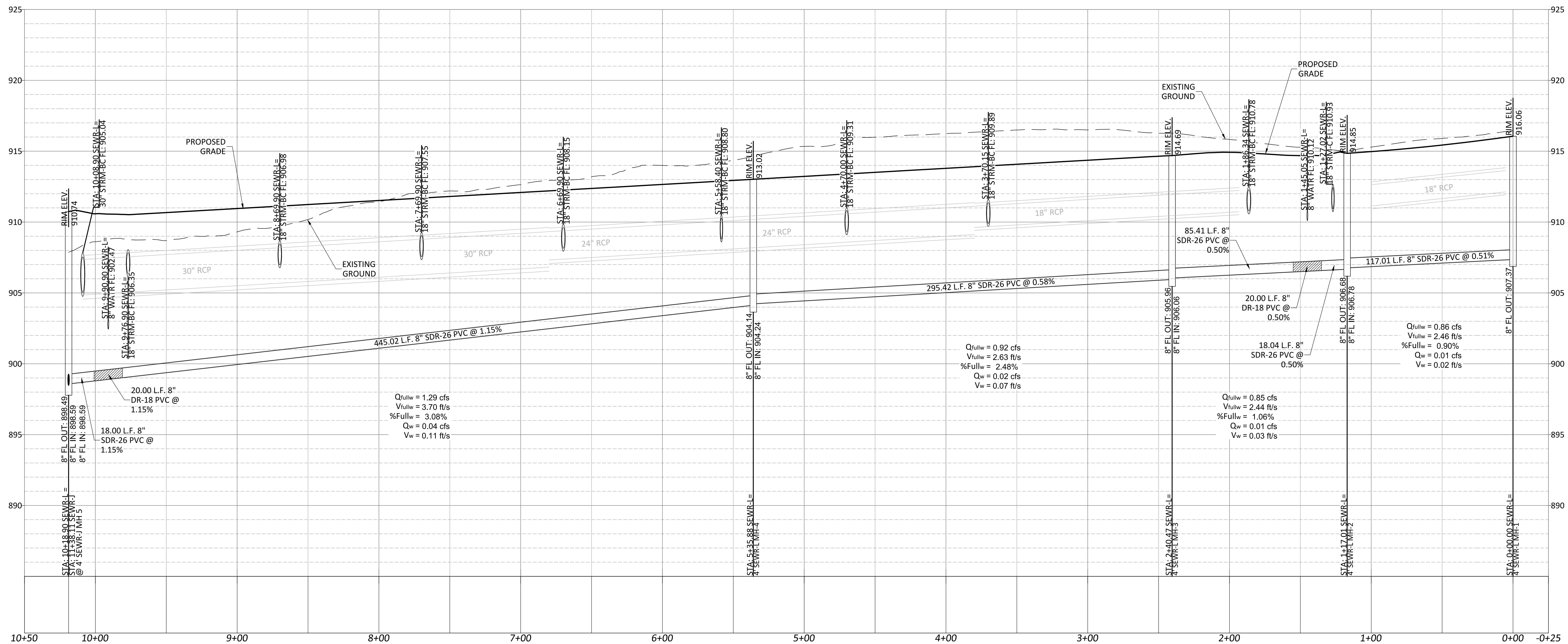
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

SEWR-K PROFILE
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	169 of 218 sheets

2021-21-CON

SEWR-L



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

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

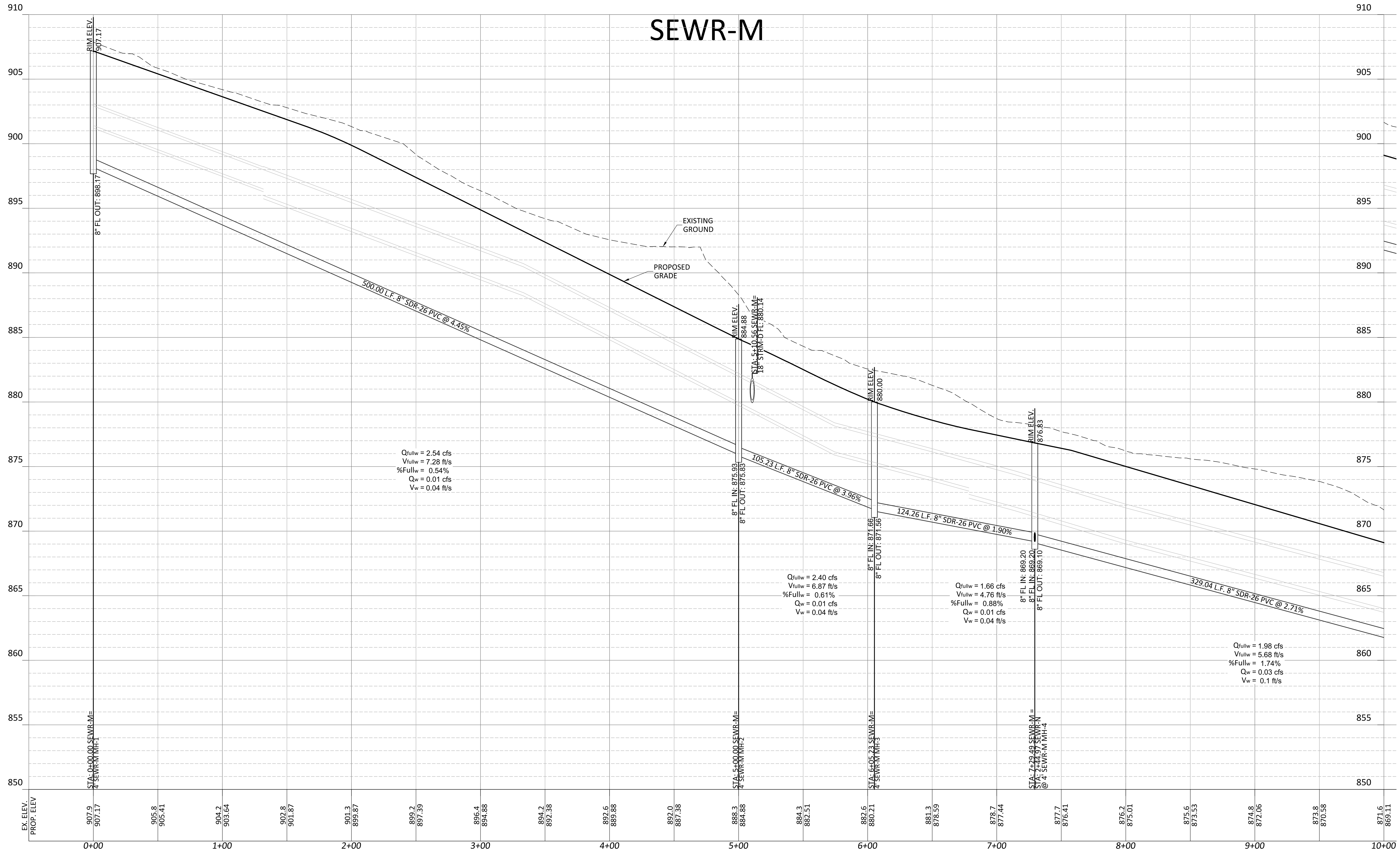
SEWR-L PROFILE
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	170 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\170 SEWR-L PROFILE.dwg By: Kevin Langford Date: 5/7/2024 1:17 PM

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

SEWR-M PROFILE (1 OF 5)

SOMERSET HILLS PHASES A-E

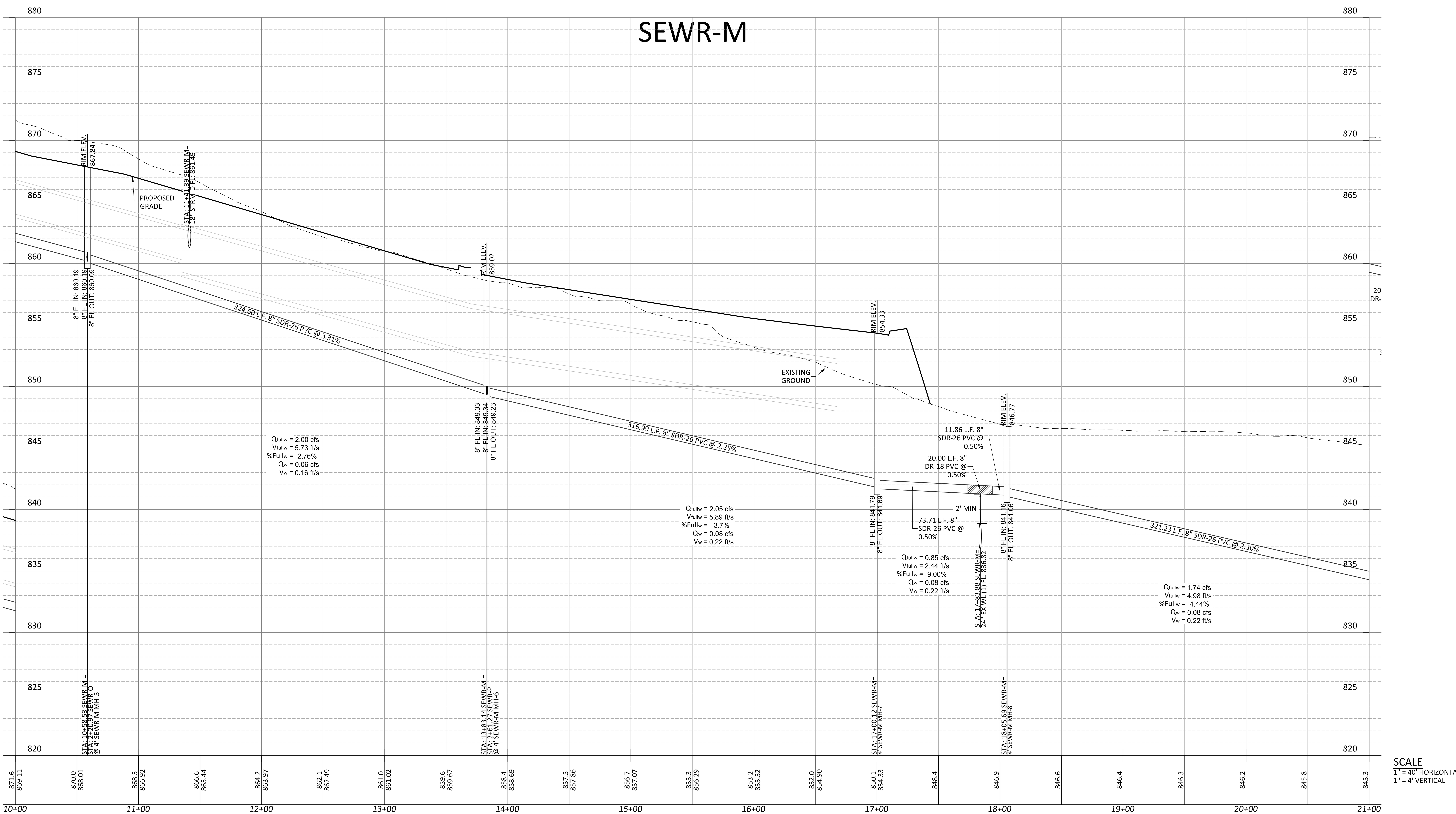
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P\22000-22999
Xref DWG FILE.	SOMERSET HILLS
Sheet Number:	171 of 218 sheets

2021-21-CON

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.

SEWR-M



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

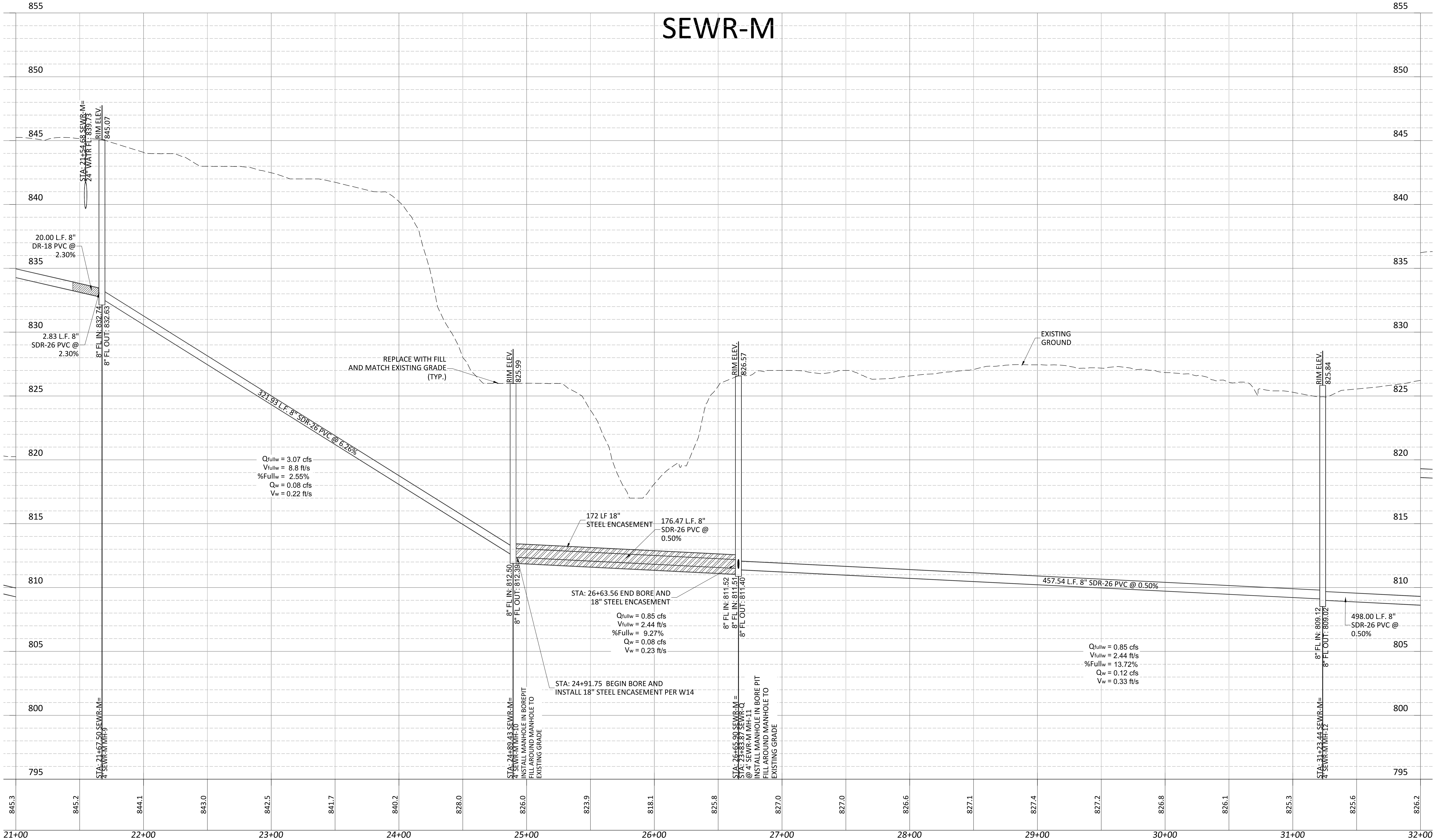
SEWR-M PROFILE (2 OF 5)
SOMERSET HILLS PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P:\22000-22999 SOMERSET HILLS
Xref DWG FILE:	
Sheet Number:	172 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\02_Parcels 6&7\CAD\Plans\172 SEWR-M PROFILE (2 OF 5).dwg By: Seth Thomas Date: 12/5/2021 2:41 PM

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

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

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

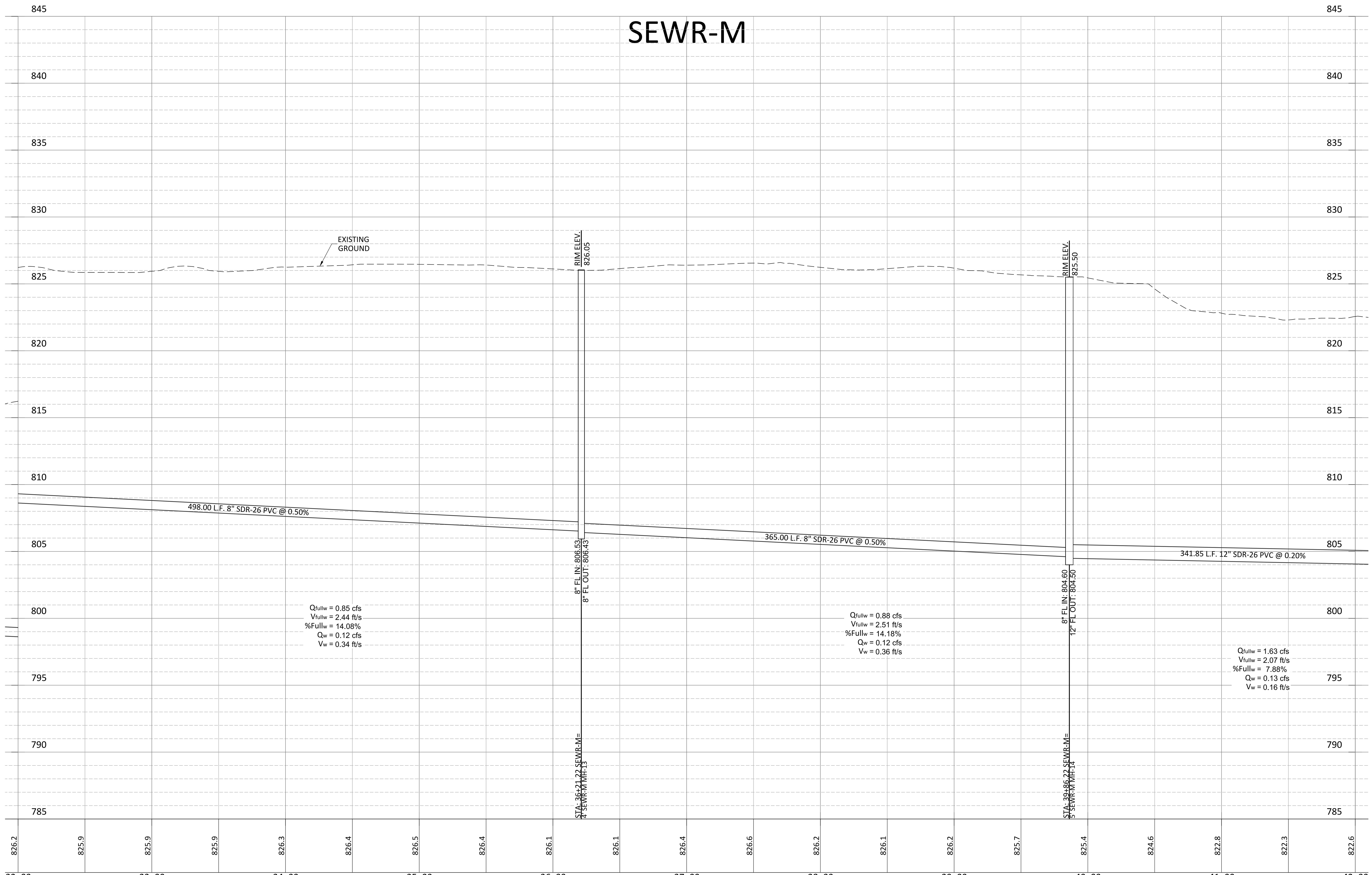
SEWR-M PROFILE (3 OF 5)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	173 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\173 SEWR-M PROFILE (3 OF 5).dwg By: Kevin Langford Date: 5/7/2024 8:14 AM

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

SEWR-M PROFILE (4 OF 5)

SOMERSET HILLS PHASES A-E

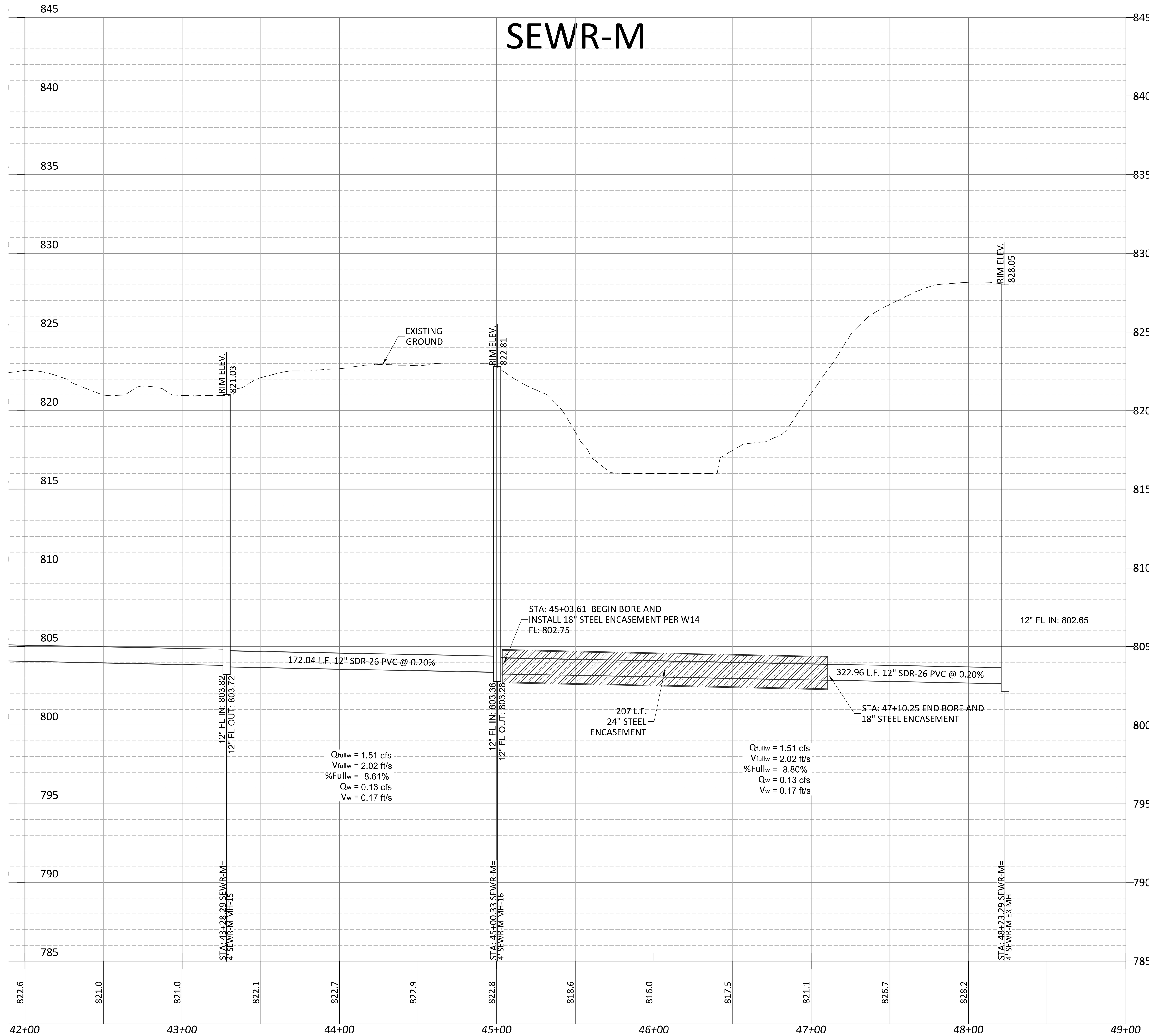
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P\22000-22999 SOMERSET HILLS
Xref DWG FILE.	
Sheet Number:	174 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\02_Parcels 6&7\CAD\Plans\174 SEWR-M PROFILE (4 OF 5).dwg By: Seth Thomas Date: 12/5/2021 2:46 PM

SEWR-M



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

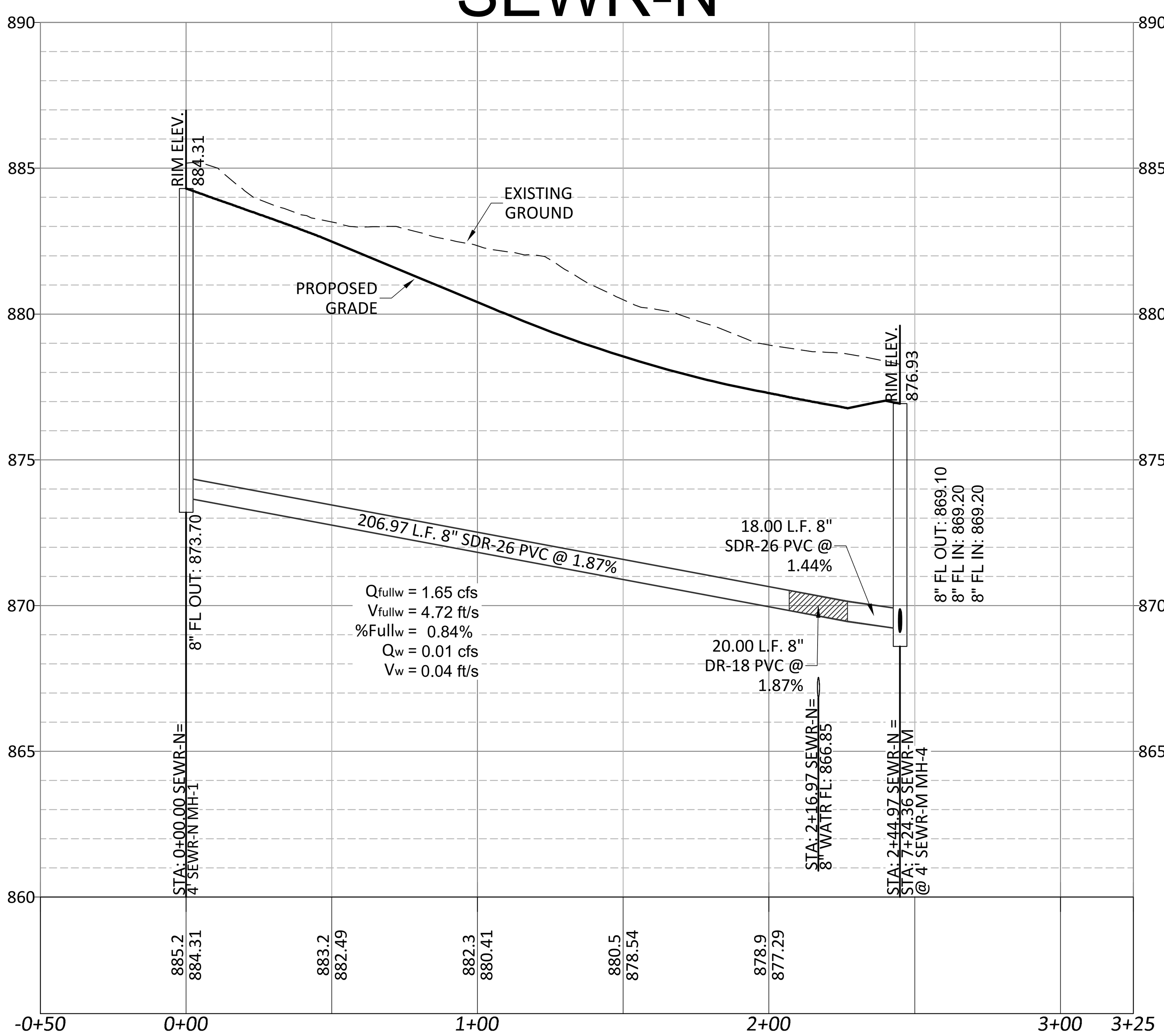
SEWR-M PROFILE (5 OF 5)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	175 of 218 sheets

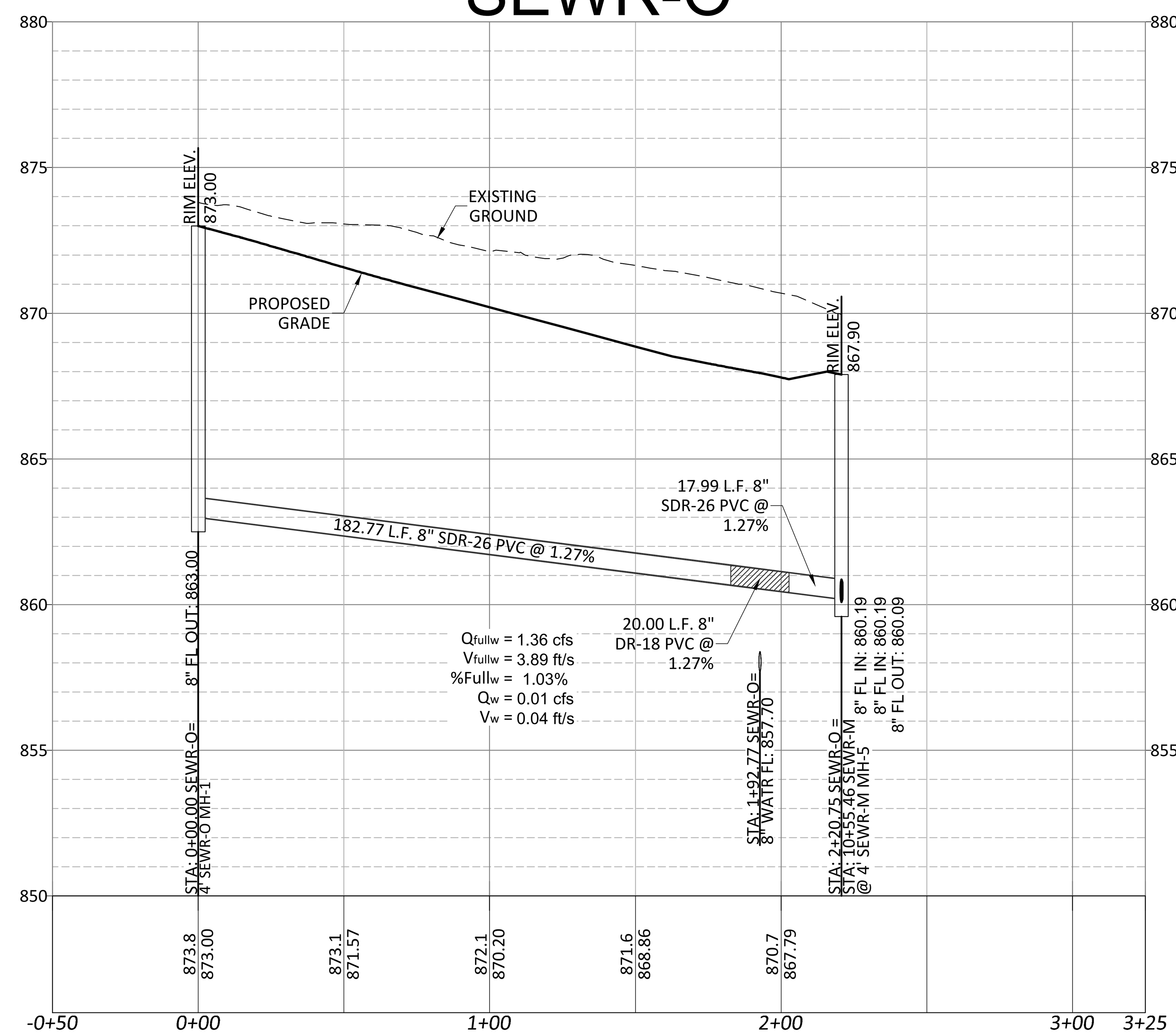
File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\175 SEWR-M PROFILE (5 OF 5).dwg By: Kevin Langford Date: 5/7/2024 8:13 AM

2021-21-CON

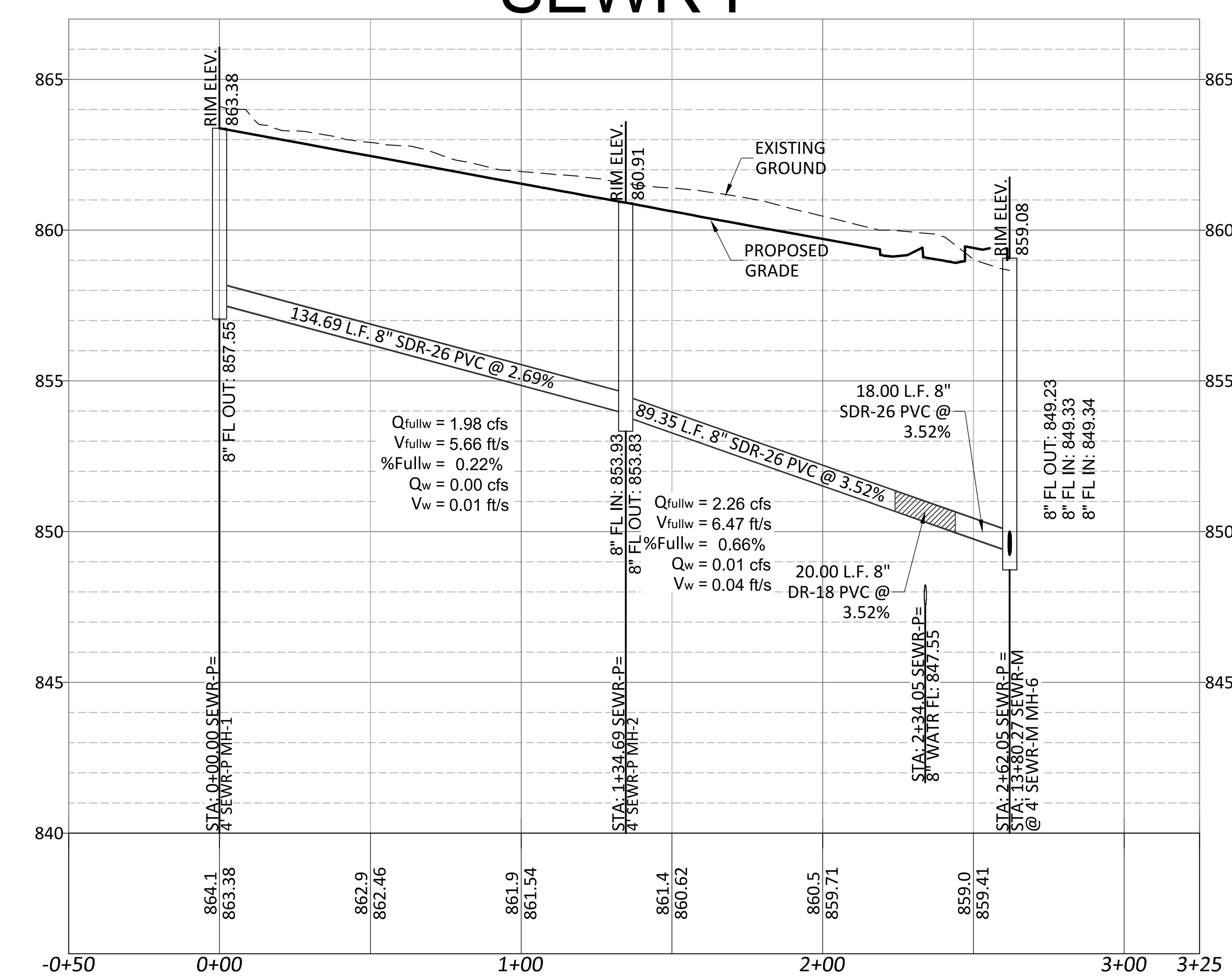
SEWR-N



SEWR-O



SEWR-P



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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

TLH, CL, EJH, TG — 03-15-2024
DESIGNED BY: DATE
TEH, TG, CL, EJH — 03-15-2024
DRAWN BY: DATE
TLH — 03-15-2024
CHECKED BY: DATE
TLH — 03-15-2024
APPROVED BY: DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

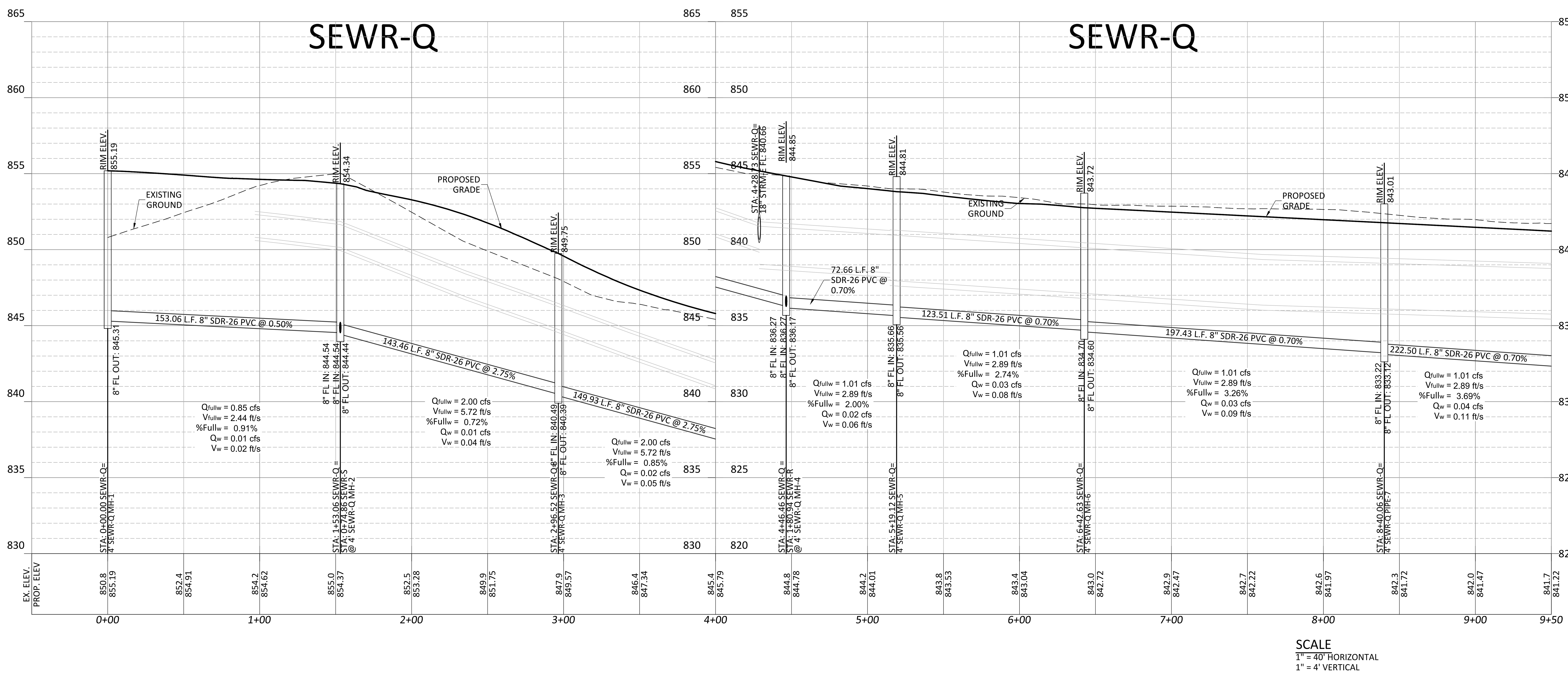
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

SEWR-N SEWR-O & SEWR-P PROFILE
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P:\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:
Sheet Number: 176 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\176 SEWR-N SEWR-O & SEWR-P PROFILE.dwg By: Kevin Langford Date: 5/7/2024 8:10 AM



THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

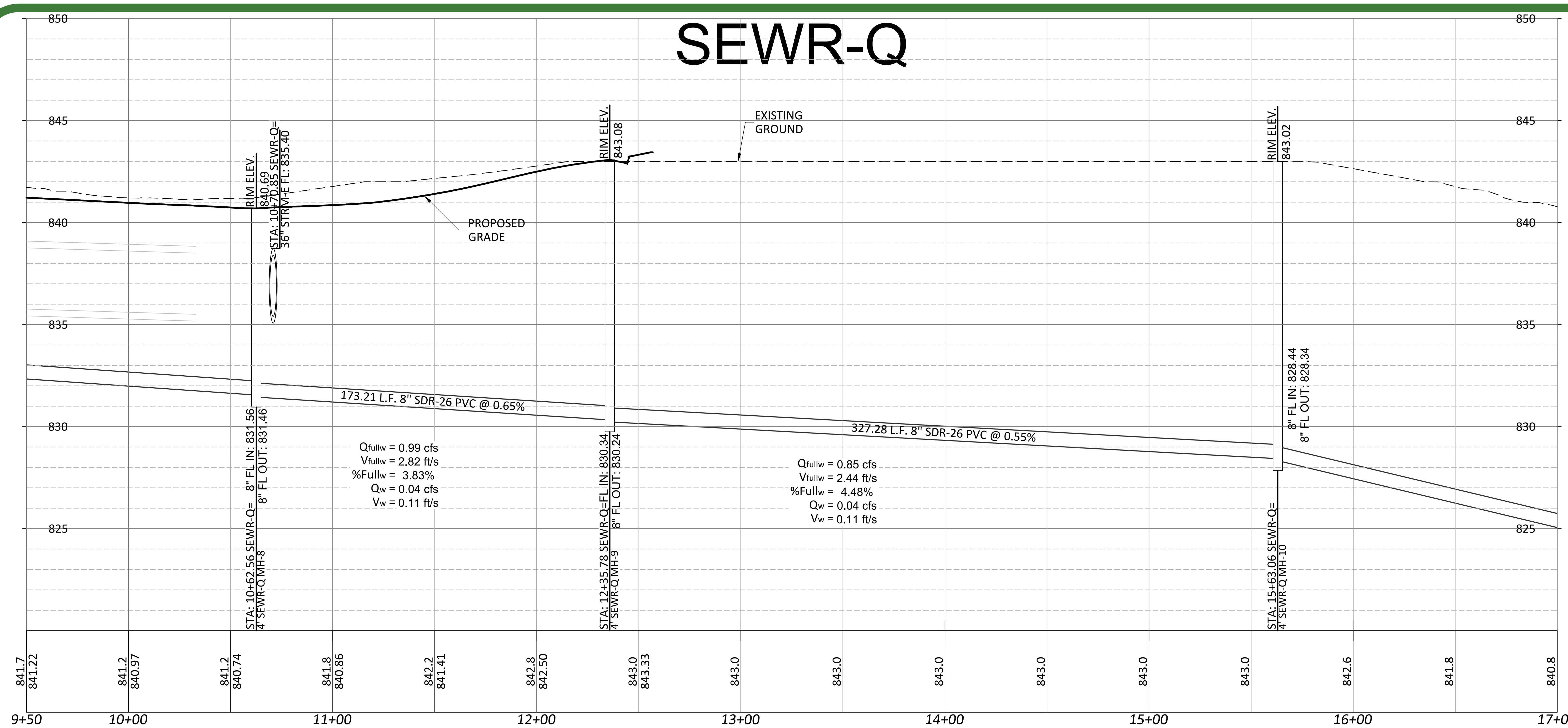
SEWR-Q PROFILE (1 OF 2)
SOMERSET HILLS PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P:\22000-22999
Xref DWG FILE:	SOMERSET HILLS
Sheet Number:	177 of 218 sheets

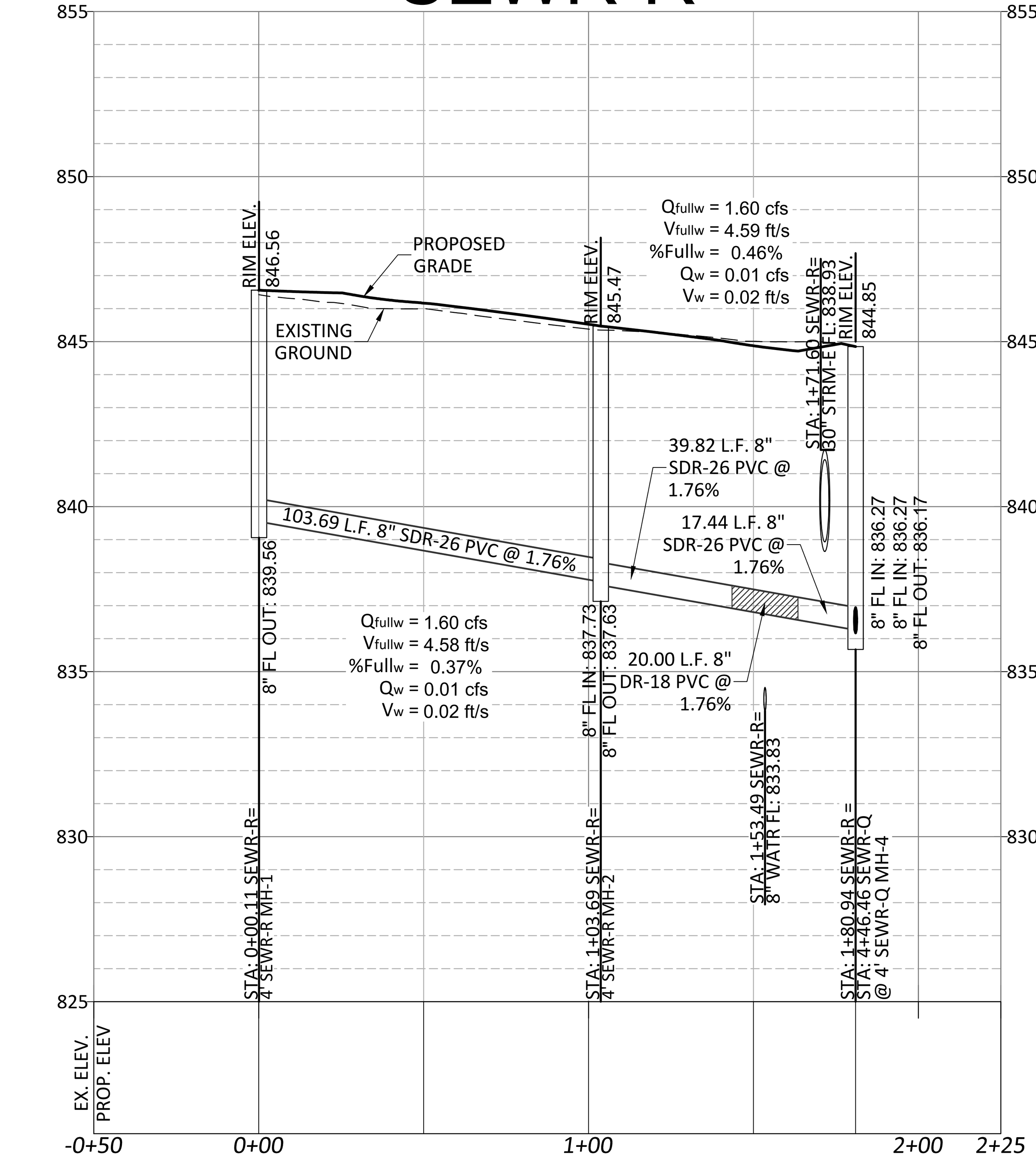
File Name: P:\22000-22999\22226 xSomerset Hills LTD\02_Parcels 6&7\CAD\Plans\177 SEWR-Q PROFILE (1 OF 2).dwg By: Seth Thomas Date: 12/5/2021 2:54 PM

2021-21-CON

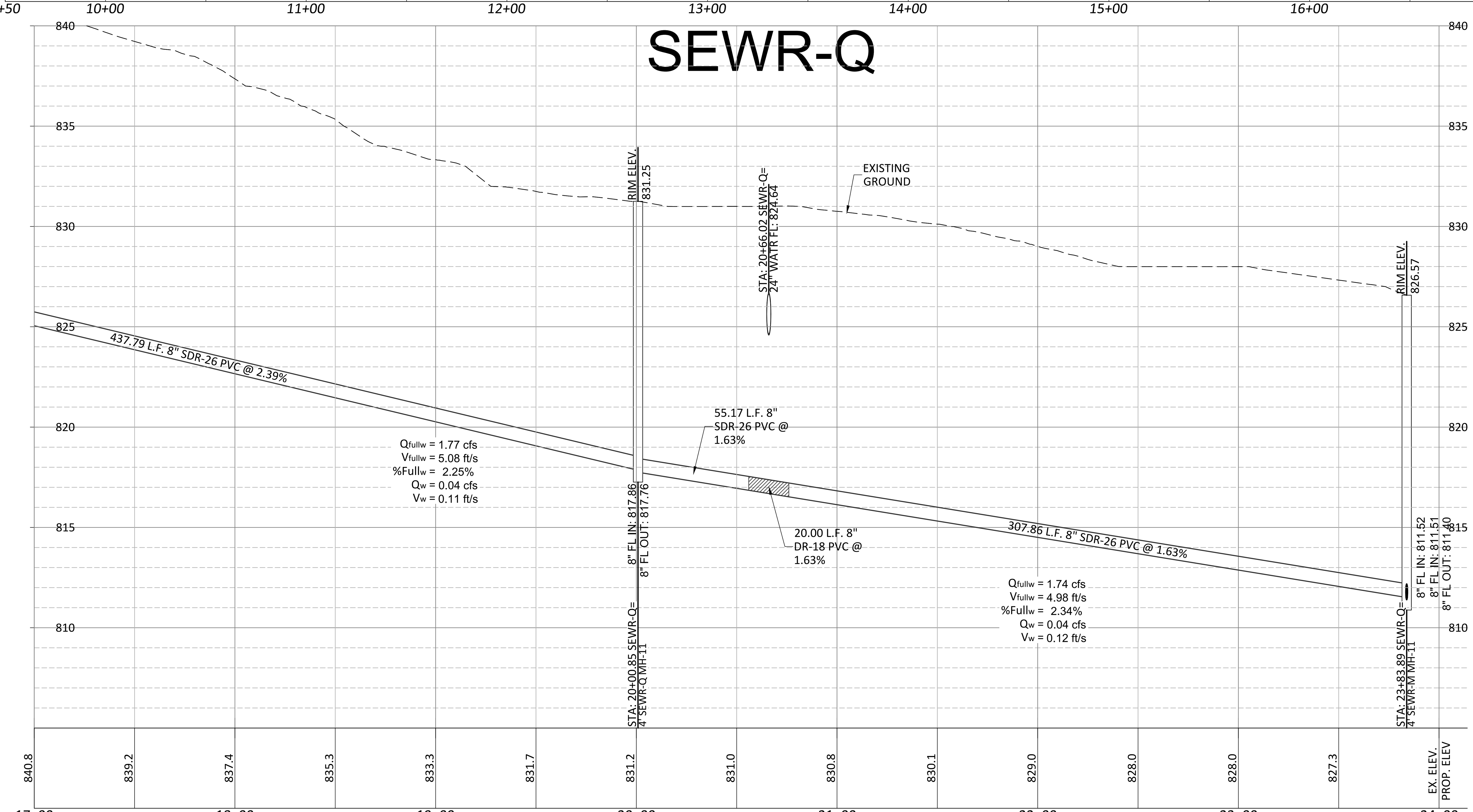
SEWR-Q



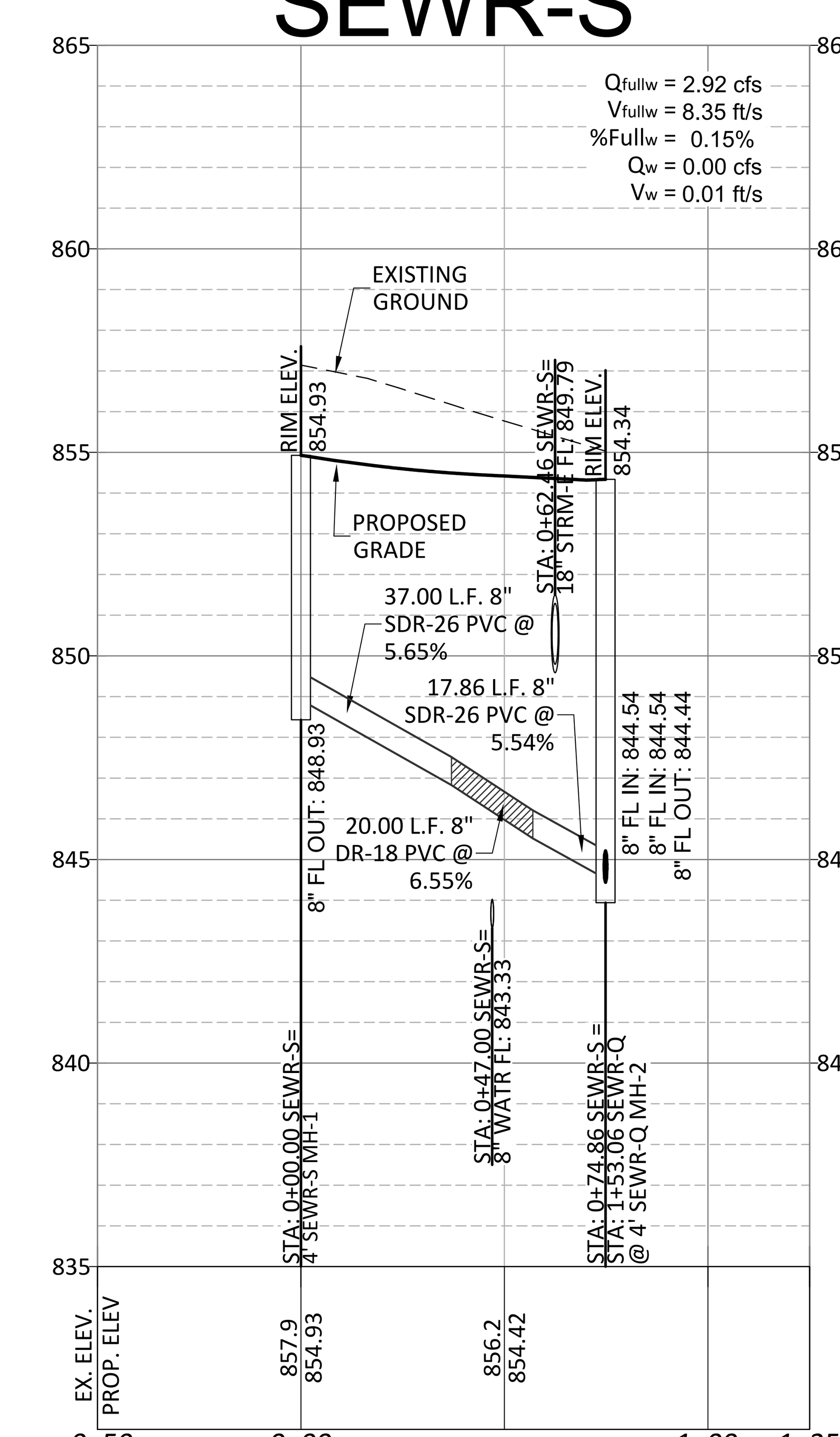
SEWR-R



SEWR-Q



SEWR-S



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

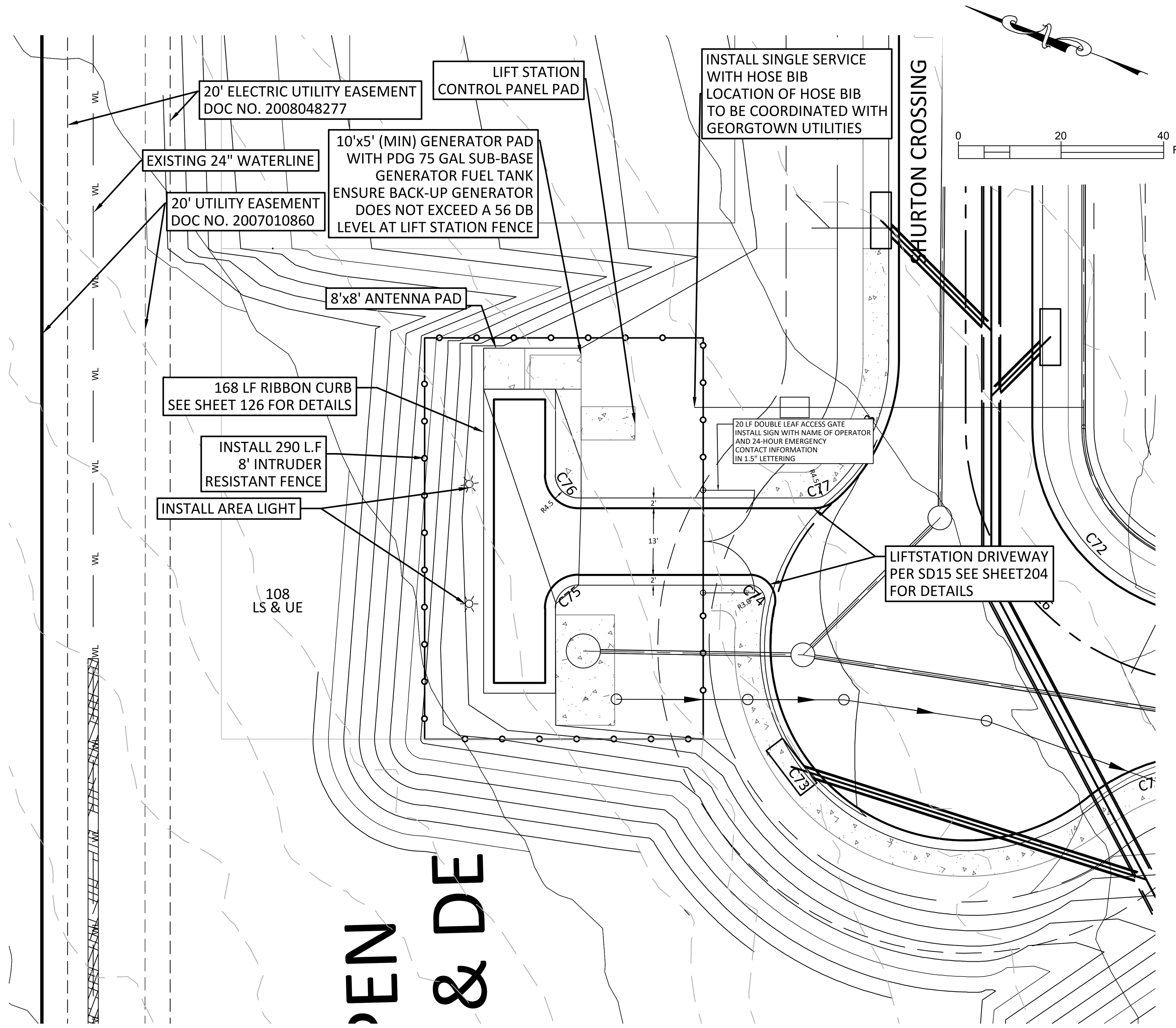
STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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

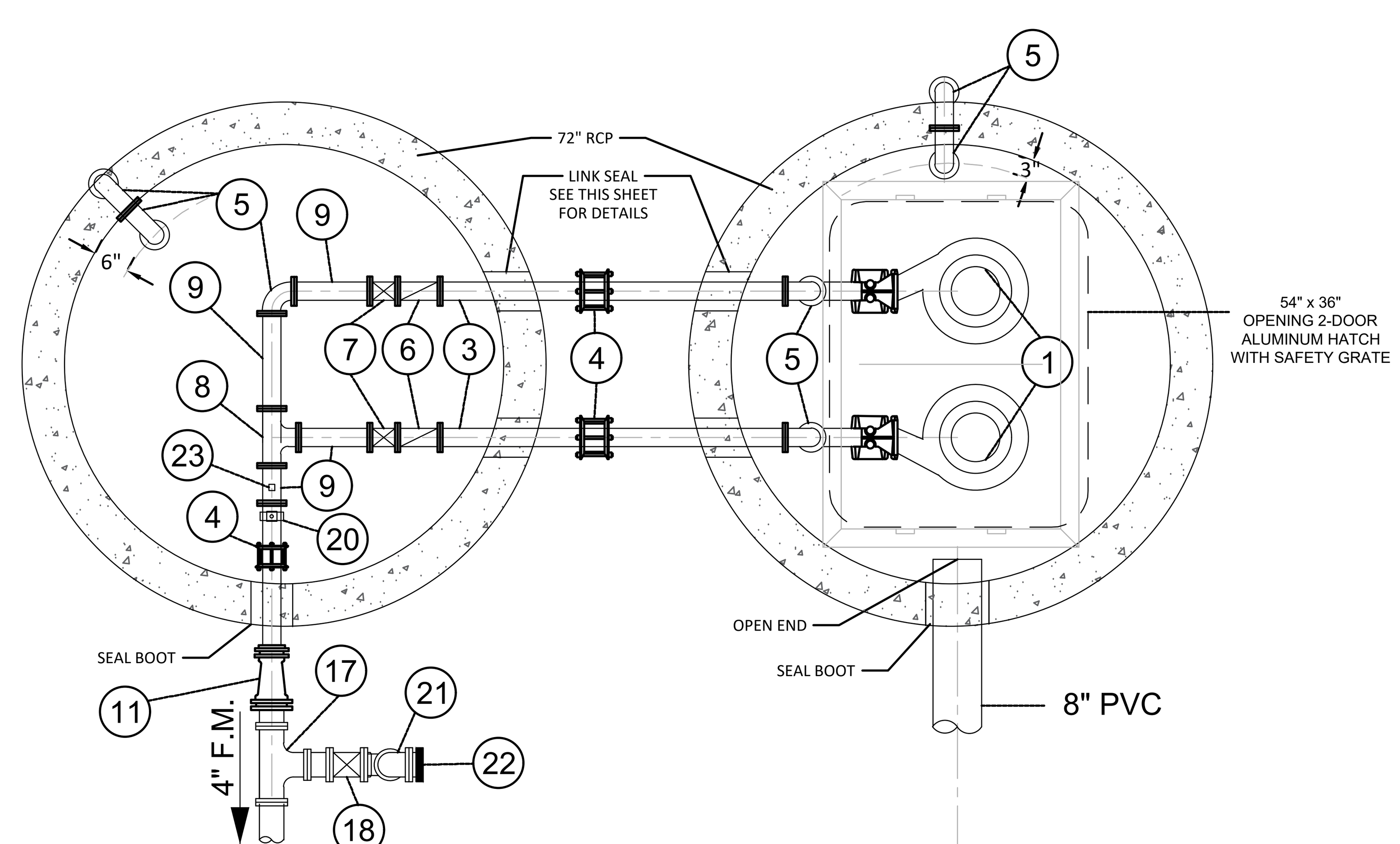
SEWR-Q PROFILE (2 OF 2), SEWR-R & SEWR-S PROFILE
SOMERSET HILLS PHASES A-E
City of Georgetown
Williamson County, Texas

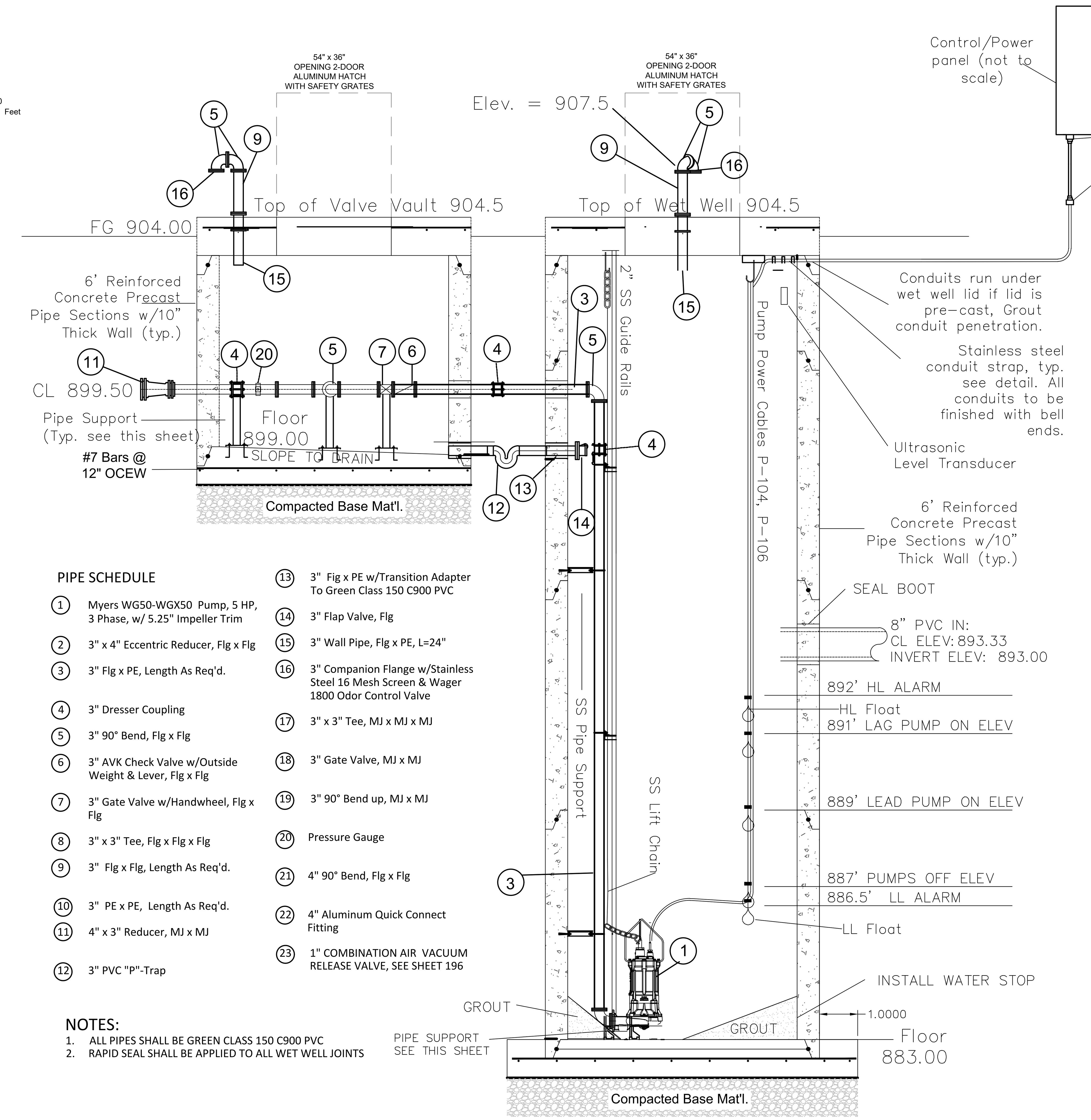
Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P:\22000-22999
Xref DWG FILE:	SOMERSET HILLS
Sheet Number:	178 of 218 sheets

2021-21-CON



PLAN
SCALE: 1' = 2"



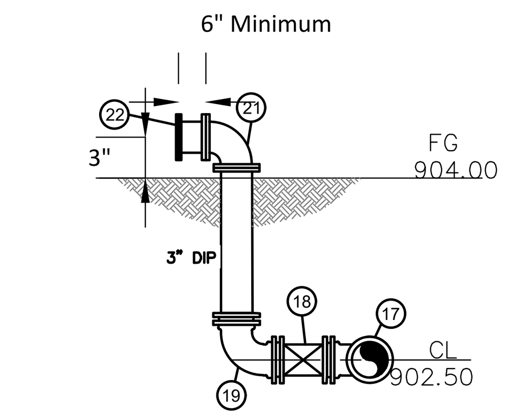


PROFILE
SCALE: 1' = 2"

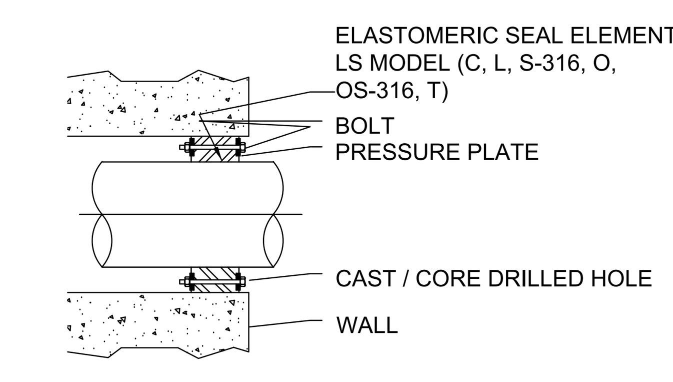
PIPE SCHEDULE

1	Myers WG50-WGX50 Pump, 5 HP, 3 Phase, w/ 5.25" Impeller Trim
2	3" x 4" Eccentric Reducer, Flg x Flg
3	3" Flg x PE, Length As Req'd.
4	3" Dresser Coupling
5	3" 90" Bend, Flg x Flg
6	3" AVK Check Valve w/Outside Weight & Lever, Flg x Flg
7	3" Gate Valve w/Handwheel, Flg x Flg
8	3" x 3" Tee, Flg x Flg x Flg
9	3" Flg x Flg, Length As Req'd.
10	3" PE x PE, Length As Req'd.
11	4" x 3" Reducer, MJ x MJ
12	3" PVC "P"-Trap
13	3" Flg x PE w/Transition Adapter To Green Class 150 C900 PVC
14	3" Flap Valve, Flg
15	3" Wall Pipe, Flg x PE, L=24"
16	3" Companion Flange w/Stainless Steel 16 Mesh Screen & Wager 1800 Odor Control Valve
17	3" x 3" Tee, MJ x MJ x MJ
18	3" Gate Valve, MJ x MJ
19	3" 90" Bend up, MJ x MJ
20	Pressure Gauge
21	4" 90" Bend, Flg x Flg
22	4" Aluminum Quick Connect Fitting
23	1" COMBINATION AIR VACUUM RELEASE VALVE, SEE SHEET 196

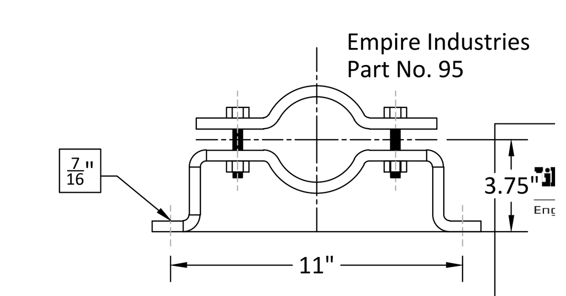
NOTES:
1. ALL PIPES SHALL BE GREEN CLASS 150 C900 PVC
2. RAPID SEAL SHALL BE APPLIED TO ALL WET WELL JOINTS



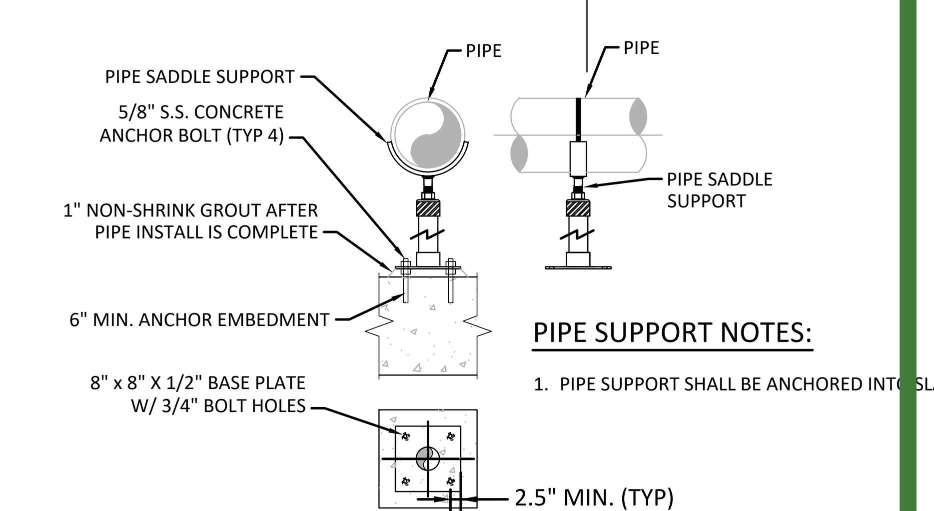
EMERGENCY PUMP CONNECTION DETAIL
N.T.S.



Link Seal Detail
NTS



STAINLESS STEEL OFFSET PIPE CLAMP DETAL
SCALE: N.T.S.



PIPE SUPPORT NOTES:
1. PIPE SUPPORT SHALL BE ANCHORED INTO SLAB.

ADJUSTABLE PIPE SUPPORT
SCALE: N.T.S.

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED PROFESSIONAL ENGINEER
11/11/21

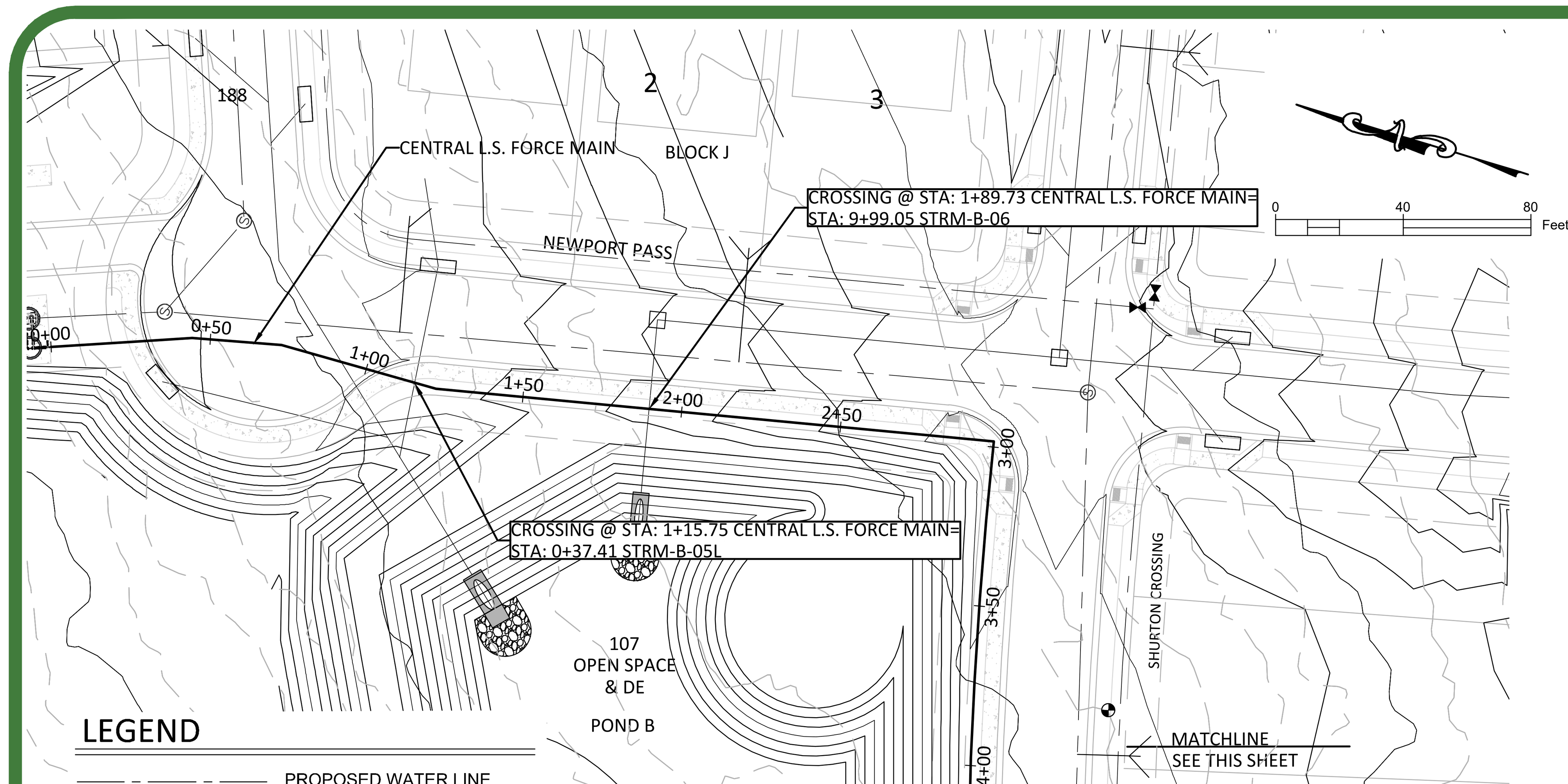
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

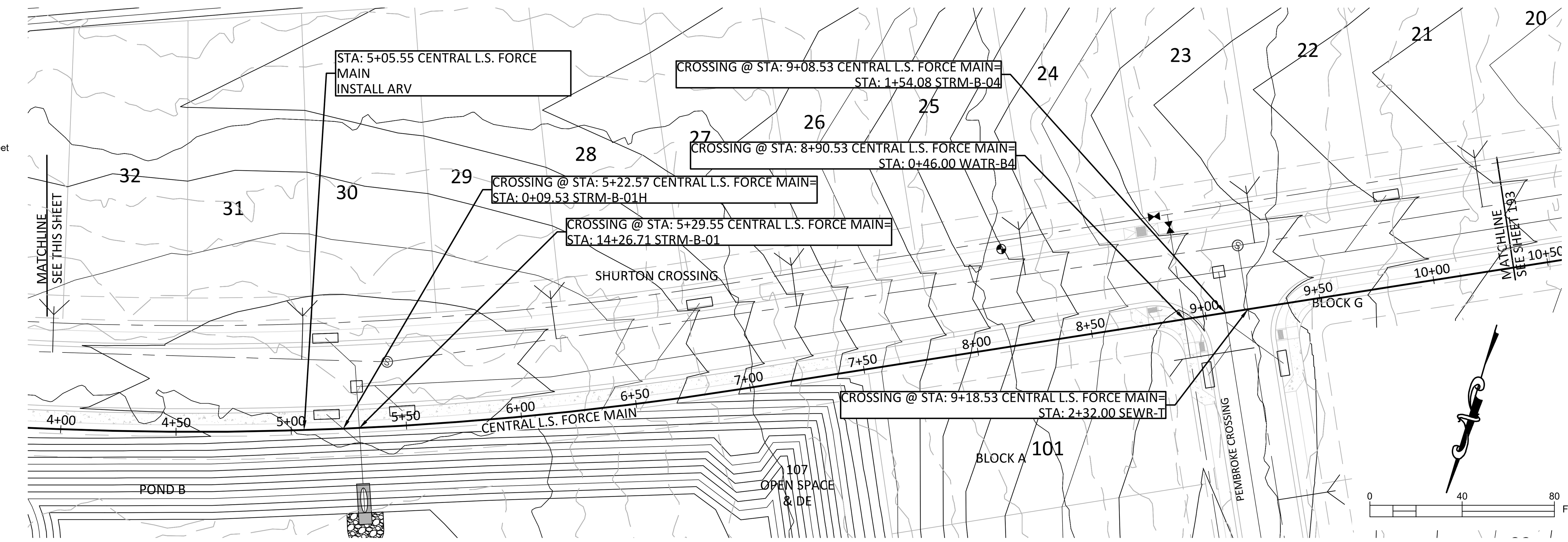
LIFT STATION SITE PLAN & DETAILS
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	188 of 218 sheets

2021-21-CON

3





NOTE

1. WARNING TAPE BEARING THE LABEL "PRESSURIZED WASTEWATER" CONTINUOUSLY IN 1.5" TALL LETTERS SHALL BE PLACED IN THE TRENCHES OF THE FORCE MAIN
2. SEE SHEET 196 FOR THRUST BLOCK DETAILS

LEGEND

- PROPOSED WATER LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE

* SEE DETAIL "W01A" FOR TYPICAL UTILITY ASSIGNMENTS

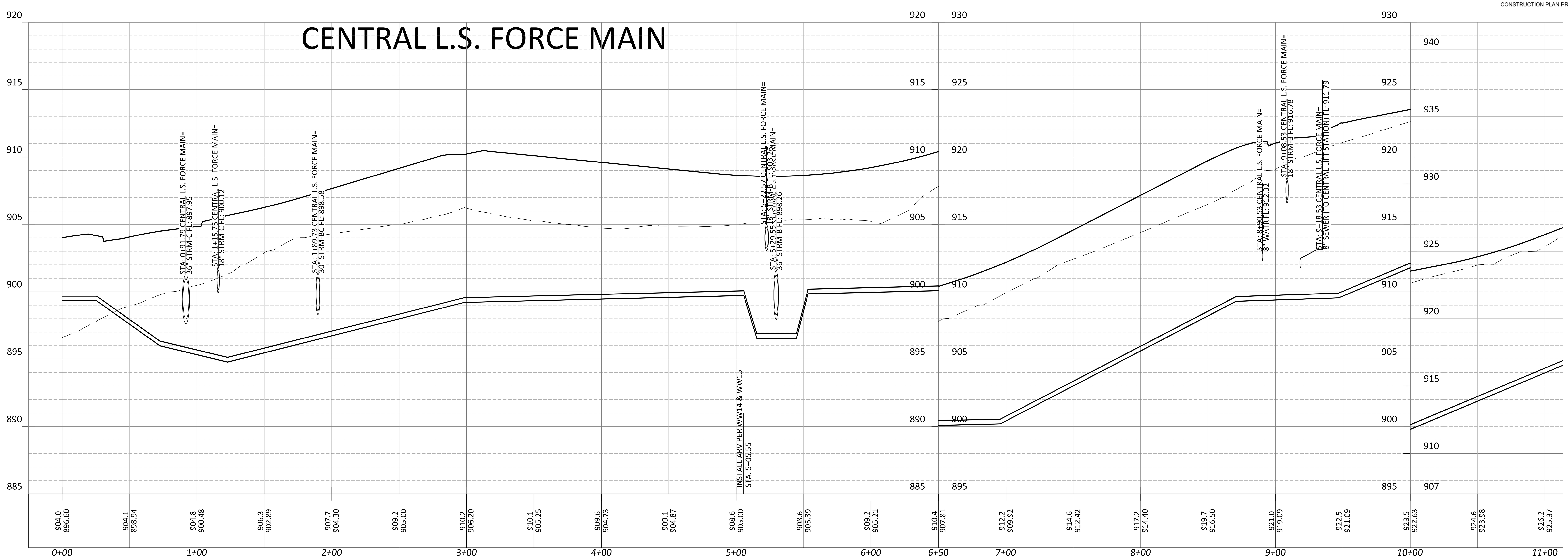
4" PVC JOINT RESTRAINT CALCULATIONS @ 100 PSI 1.5 SAFETY FACTOR

JOINT TYPE	RESTRAINT LENGTH [FT]
90° BEND	8
45° BEND	3
22.5° BEND	2
11.25° BEND	1
PLUG	13

NOTES:
ASSUMES A GW SOIL TYPE REPRESENTIVE OF WELL-GRADED GRAVELS AND SAND MIXTURES

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO CONSTRUCTION.

CENTRAL L.S. FORCE MAIN



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG	03-15-2024
DESIGNED BY:	DATE
TEH, TG, CL, EJH	03-15-2024
DRAWN BY:	DATE
TLH	03-15-2024
CHECKED BY:	DATE
TLH	03-15-2024
APPROVED BY:	DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

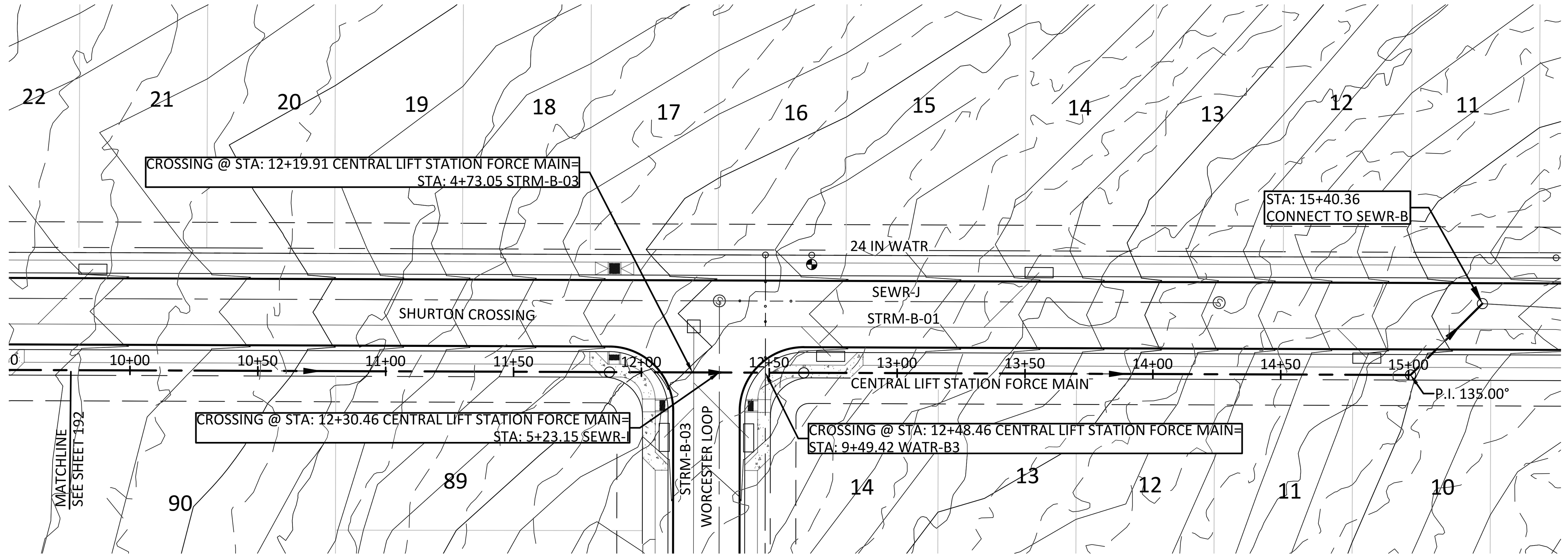
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

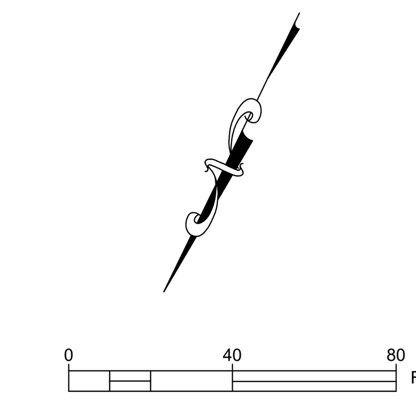
4 IN FORCE MAIN PLAN & PROFILE (1 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:	
Sheet Number:	192 of 218 sheets

2021-21-CON

File Name: P:\22000-22999\22226 xSomerset Hills LTD\07_Parcel 6A&B\CAD\Plans\192 4 IN FORCE MAIN PLAN & PROFILE (1 OF 2).dwg By: Kevin Langford Date: 5/6/2024 5:31 PM





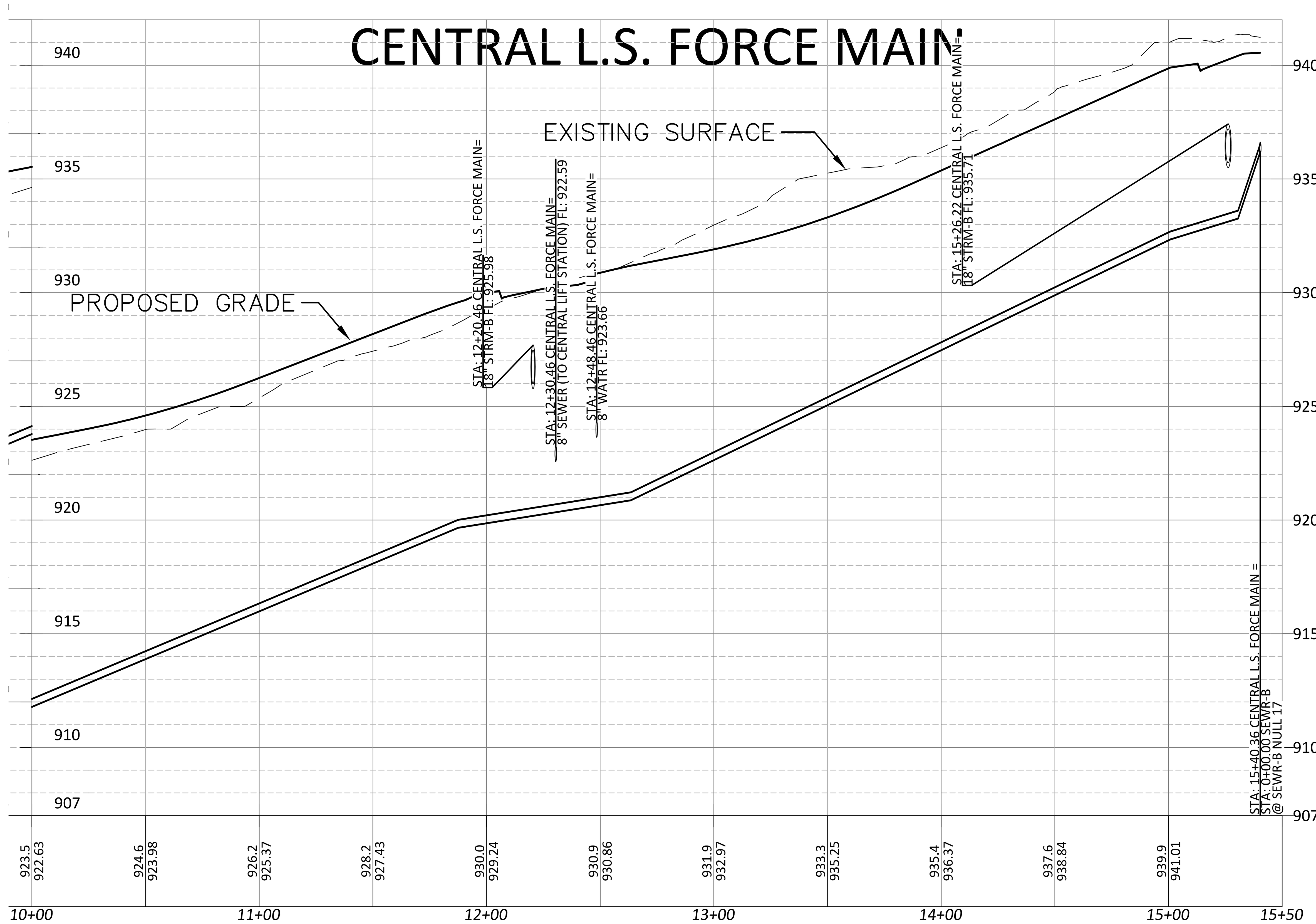
NOTE

1. WARNING TAPE BEARING THE LABEL "PRESSURIZED WASTEWATER" CONTINUOUSLY IN 1.5" TALL LETTERS SHALL BE PLACED IN THE TRENCHES OF THE FORCE MAIN
2. SEE SHEET 196 FOR THRUST BLOCK DETAILS

LEGEND

- PROPOSED WATER LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- CURB INLET
- DOUBLE WATER SERVICE
- SINGLE WATER SERVICE
- DOUBLE SEWER SERVICE
- SINGLE SEWER SERVICE

* SEE DETAIL "W01A" FOR TYPICAL UTILITY ASSIGNMENTS



SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

4" PVC JOINT RESTRAINT CALCULATIONS @ 100 PSI 1.5 SAFETY FACTOR	
JOINT TYPE	RESTRAINT LENGTH [FT]
90° BEND	8
45° BEND	3
22.5° BEND	2
11.25° BEND	1
PLUG	13

NOTES:
ASSUMES A GW SOIL TYPE REPRESENTIVE OF WELL-GRADED GRAVELS AND SAND MIXTURES

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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
3	ATMOS EASEMENT ADJUSTMENTS	TH	3/18/24

TLH, CL, EJH, TG — 03-15-2024
DESIGNED BY: — DATE
TEH, TG, CL, EJH — 03-15-2024
DRAWN BY: — DATE
TLH — 03-15-2024
CHECKED BY: — DATE
TLH — 03-15-2024
APPROVED BY: — DATE

STATE OF TEXAS
TYSON L. HASZ
145151
LICENSED
PROFESSIONAL ENGINEER
5/7/2024

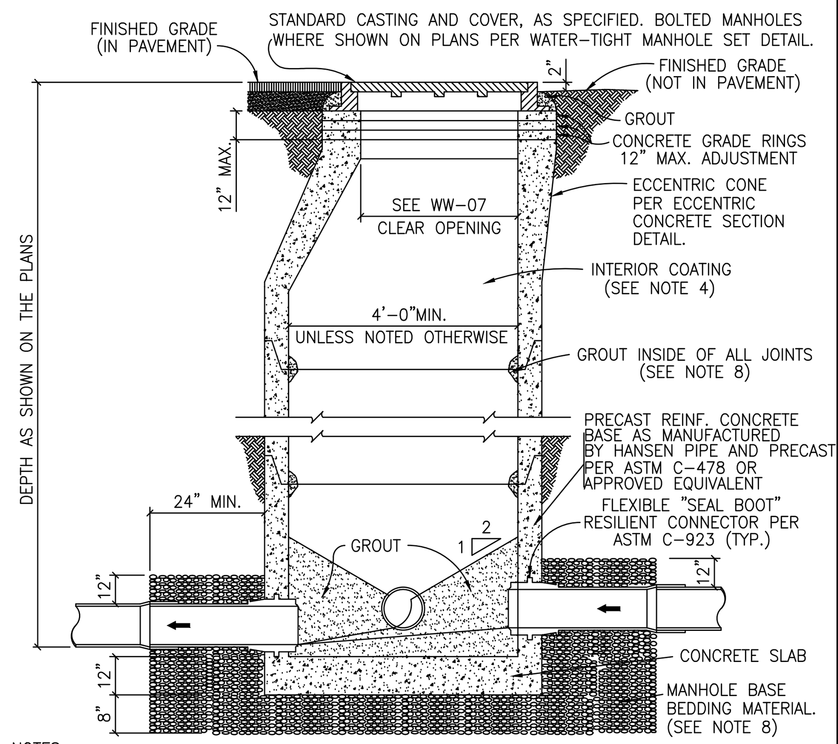
STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

4 IN FORCE MAIN PLAN & PROFILE (2 OF 2)
SOMERSET HILLS - PHASES A-E
City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P:\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: Somerset Hills LTD\07_Parcel 6A&B\CAD\Plans
Xref DWG FILE:
Sheet Number: 193 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\07_parcel 6a&b\CAD\Plans\193 4 IN FORCE MAIN PLAN & PROFILE (2 OF 2).dwg By: Kevin Langford Date: 5/7/2024 1:23 PM



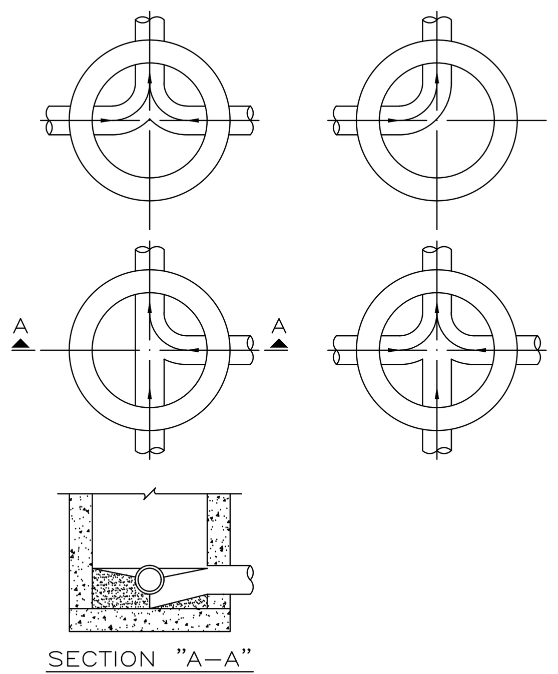
NOTES:

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 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 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 GASKETTED 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 LOADS.
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.

GEORGETOWN TEXAS EST. 1848 Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS STANDARD MANHOLE – SECTION	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: WW03 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB

FLOW PATTERNS FOR INVERT CHANNELS



NOTES:

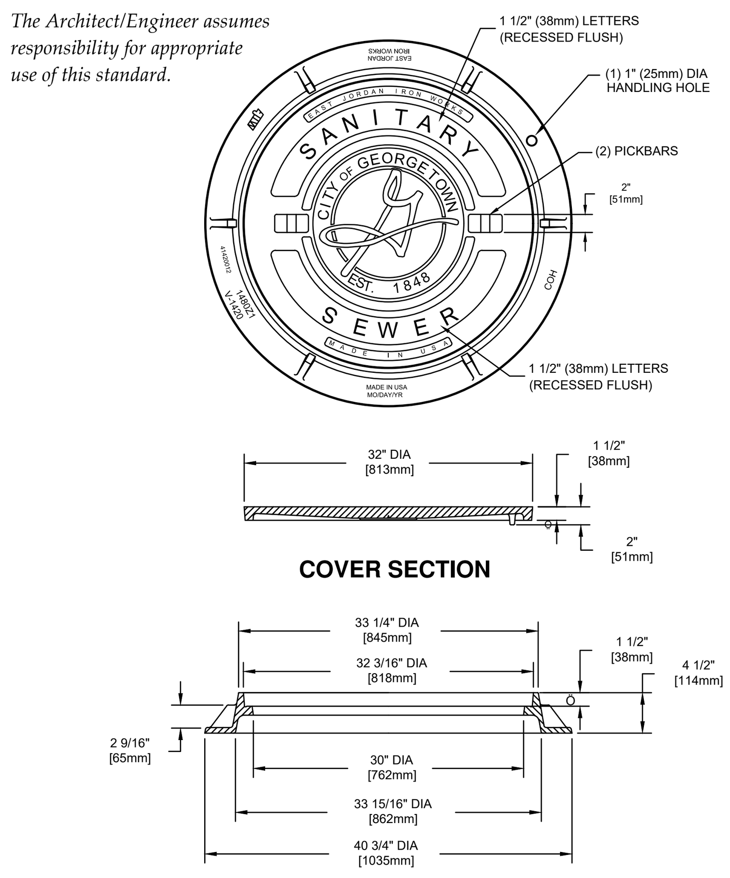
1. INVERT CHANNELS TO BE CONSTRUCTED FOR SMOOTH FLOW WITH NO OBSTRUCTIONS.
2. SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS PROVIDING FOR SMOOTH FLOW.
3. CHANNELS FOR FUTURE CONSTRUCTIONS (STUBS) SHALL BE CONSTRUCTED, FILLED WITH SAND, AND COVERED WITH 1" OF MORTAR.
4. 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 FOR PIPES LESS THAN 15 INCHES IN DIAMETER AND A MINIMUM OF 3/4 THE DIAMETER OF THE LARGEST PIPE FOR PIPES AT LEAST 15 INCHES IN DIAMETER BUT NOT MORE THAN 24 INCHES IN DIAMETER.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

MODIFIED 11-17-2014 BY STEGER BIZZELL FOR CHAPTER 217 COMPLIANCE.

GEORGETOWN TEXAS EST. 1848 Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS FLOW PATTERNS FOR INVERT CHANNELS	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: WW06 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB

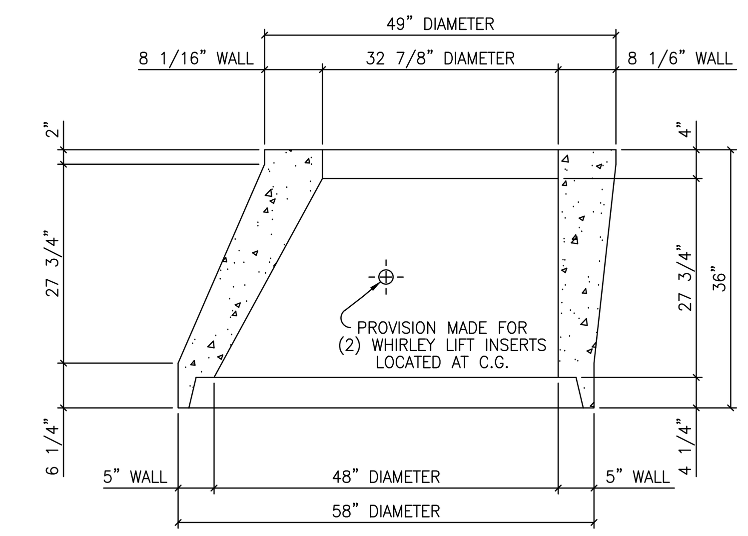
The Architect/Engineer assumes responsibility for appropriate use of this standard.



NOTES:

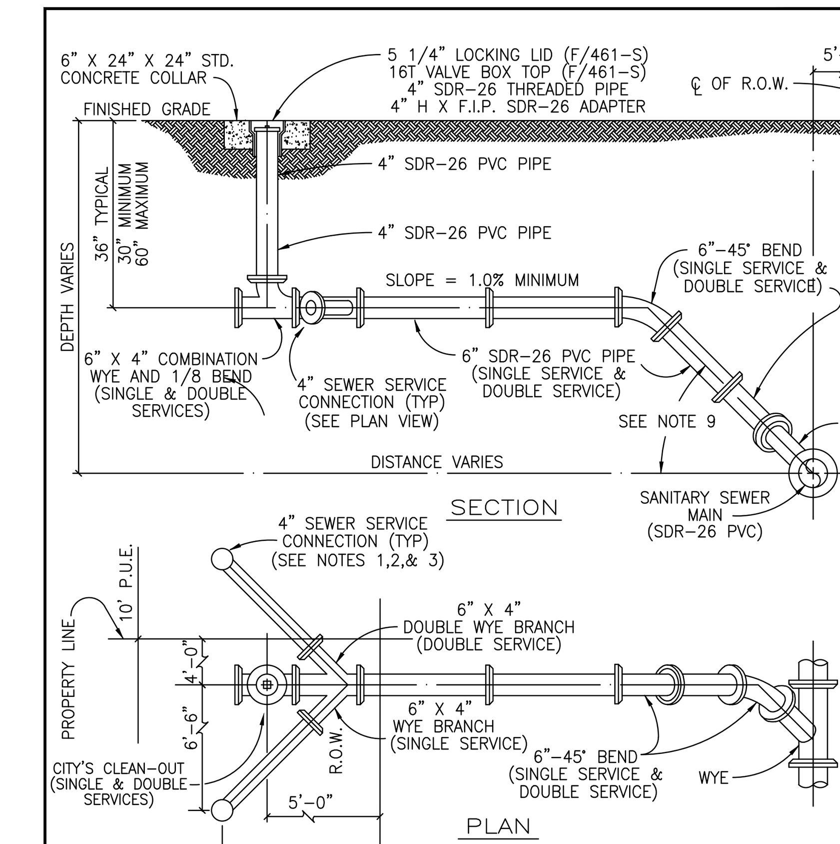
1. STANDARD WASTEWATER MANHOLE SET TO BE EAST JORDAN IRON WORKS, INC. CATALOG NO. 1480A V-1420/148021, COVER TO BE STAMPED WITH "SANITARY SEWER".
2. STANDARD WASTEWATER MANHOLE SET TO BE HEAVY DUTY LOAD RATED.
3. FOR MORE DETAILED SPECIFICATIONS REFER TO EAST JORDAN IRON WORKS, INC. REFERENCE PRODUCT DRAWING 41420012 00148390.
4. FOR BOLTED WASTEWATER MANHOLE SET REFER TO DETAIL WW07A.

GEORGETOWN TEXAS EST. 1848 Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS STANDARD WASTEWATER MANHOLE SET	REVISION NOTE: ADOPTED 6/21/2006 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.

GEORGETOWN TEXAS EST. 1848 Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS 48"X5" TO 33"X8"X36" TALL ECCENTRIC CONCRETE SECTION	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: WW08 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB

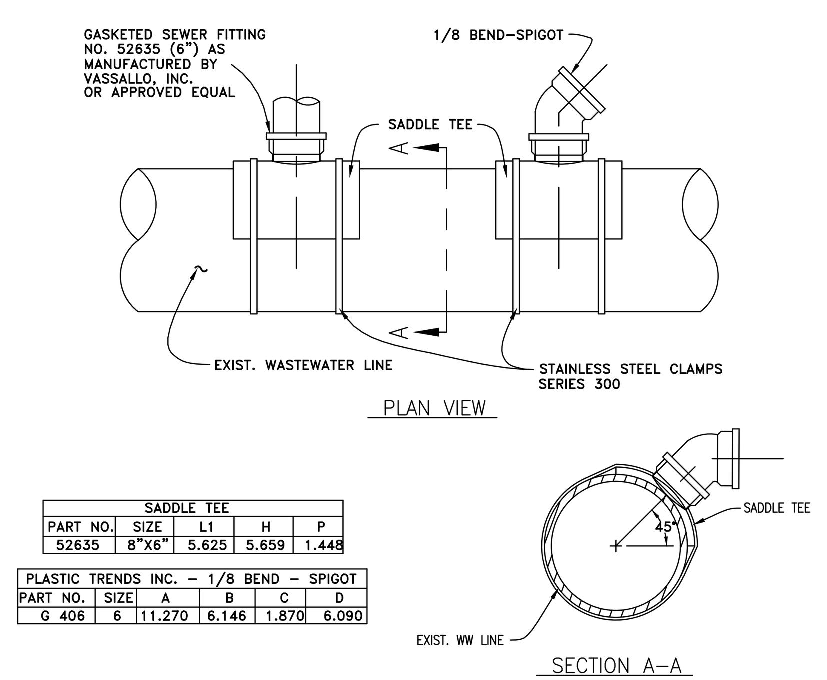


NOTES:

1. SERVICE CONNECTION RISERS SHALL TERMINATE 8' INSIDE THE PROPERTY 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.

GEORGETOWN TEXAS EST. 1848 Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS SEWER SERVICE CONNECTIONS	REVISION NOTE: ADOPTED 6/21/2006 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

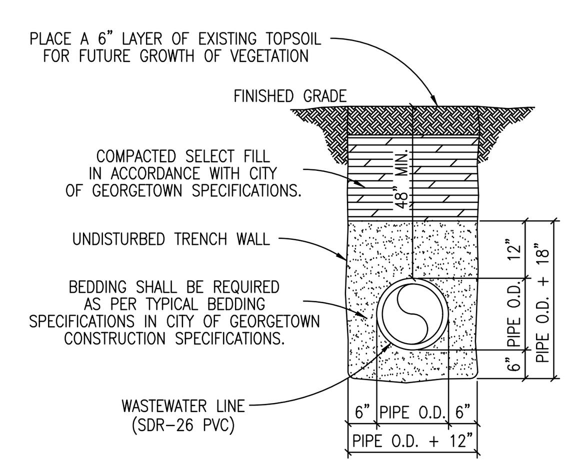
PLASTIC TRENDS INC. – 1/8 BEND – SPIGOT					
PART NO.	SIZE	A	B	C	D
G 406	6	11.270	6.146	1.870	6.090

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 OR 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.

GEORGETOWN TEXAS EST. 1848 Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS GASKETED SEWER FITTING FOR SEWER SERVICE CONNECTIONS TO EXISTING MAINS	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: WW13A SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB



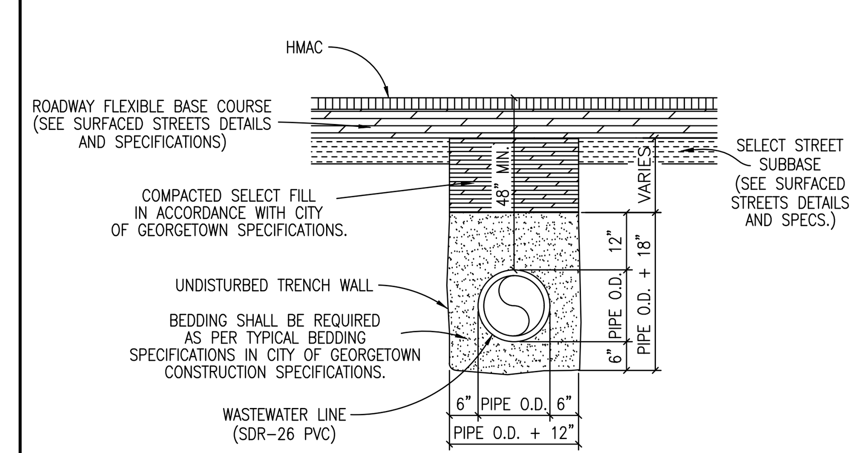
TRENCH WIDTHS

*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.

GEORGETOWN TEXAS EST. 1848 Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS TRENCH AND EMBEDMENT DETAIL UNDER NON-PAVED AREAS	REVISION NOTE: ADOPTED 6/21/2006 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.

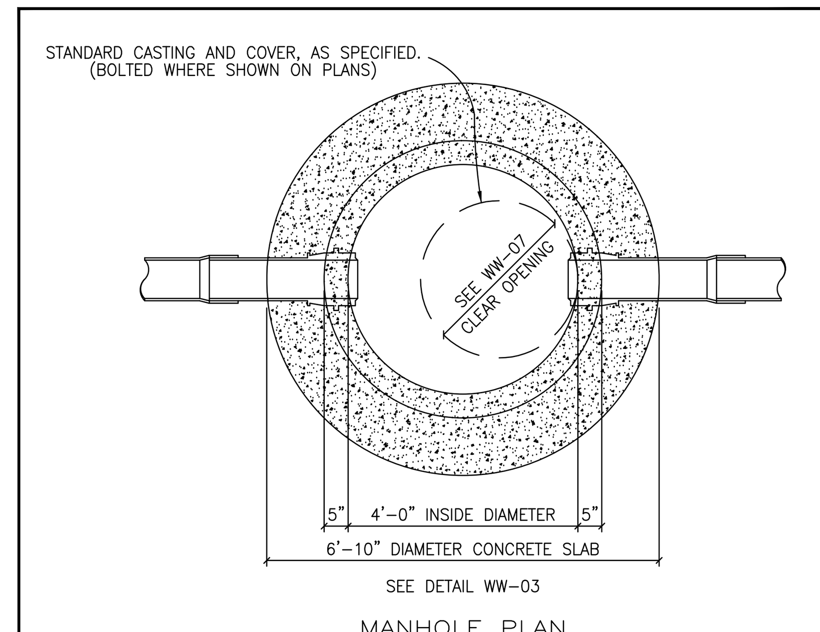
*20" DIAMETER PIPE AND LARGER 2'-0" + PIPE O.D.

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.

GEORGETOWN TEXAS EST. 1848 Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS TRENCH AND EMBEDMENT DETAIL UNDER PROPOSED ROADWAY	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: WW18 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB



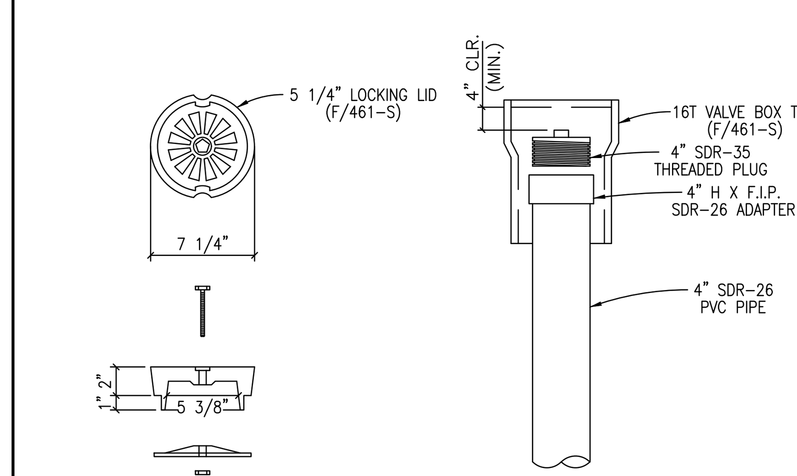
CITY OF GEORGETOWN NOTES:

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.

GEORGETOWN TEXAS EST. 1848 Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS STANDARD MANHOLE – PLAN	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: WW02 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB



5 1/4" LOCKING LID
(F/461-S)

SEWER CLEAN-OUT
CITY OF GEORGETOWN (RESIDENTIAL SERVICE)

The Architect/Engineer assumes responsibility for appropriate use of this standard.

GEORGETOWN TEXAS EST. 1848 Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS SEWER CLEAN-OUT DETAIL	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: WW12 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED PROFESSIONAL ENGINEER
11/1/21

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 3)

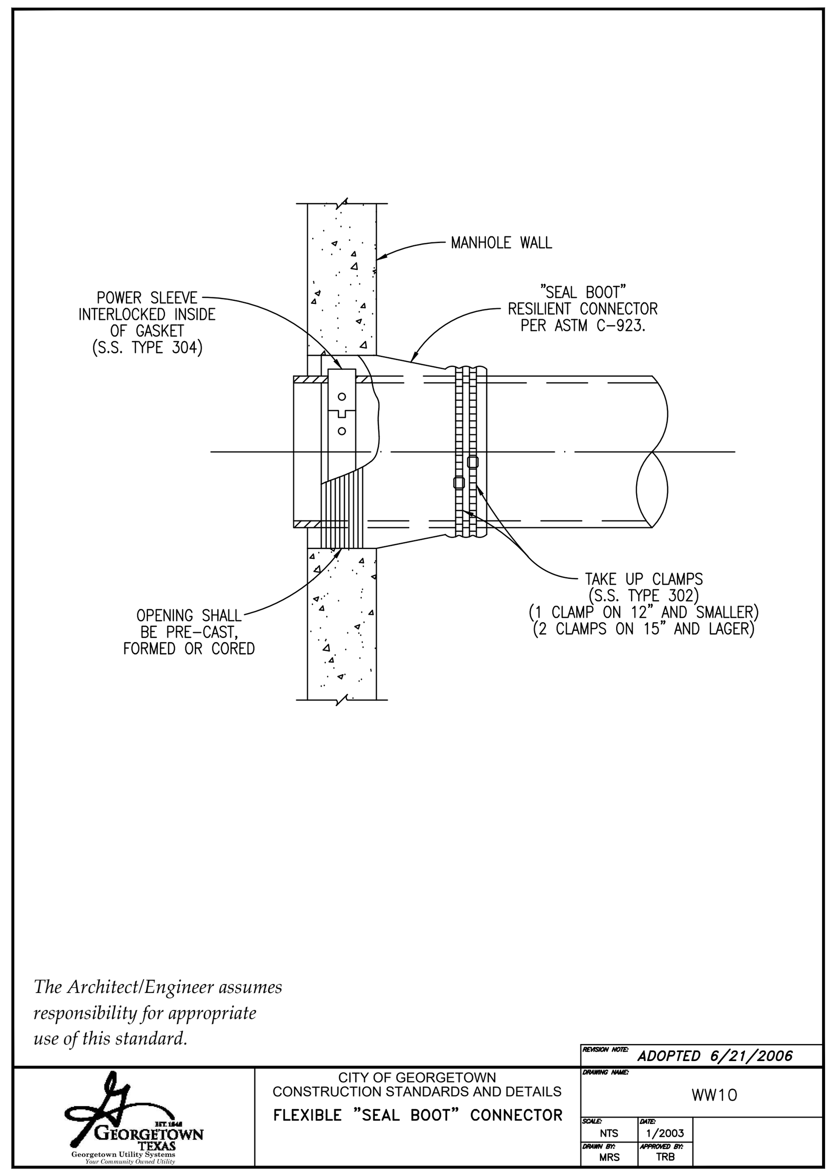
SOMERSET HILLS PHASES A-E

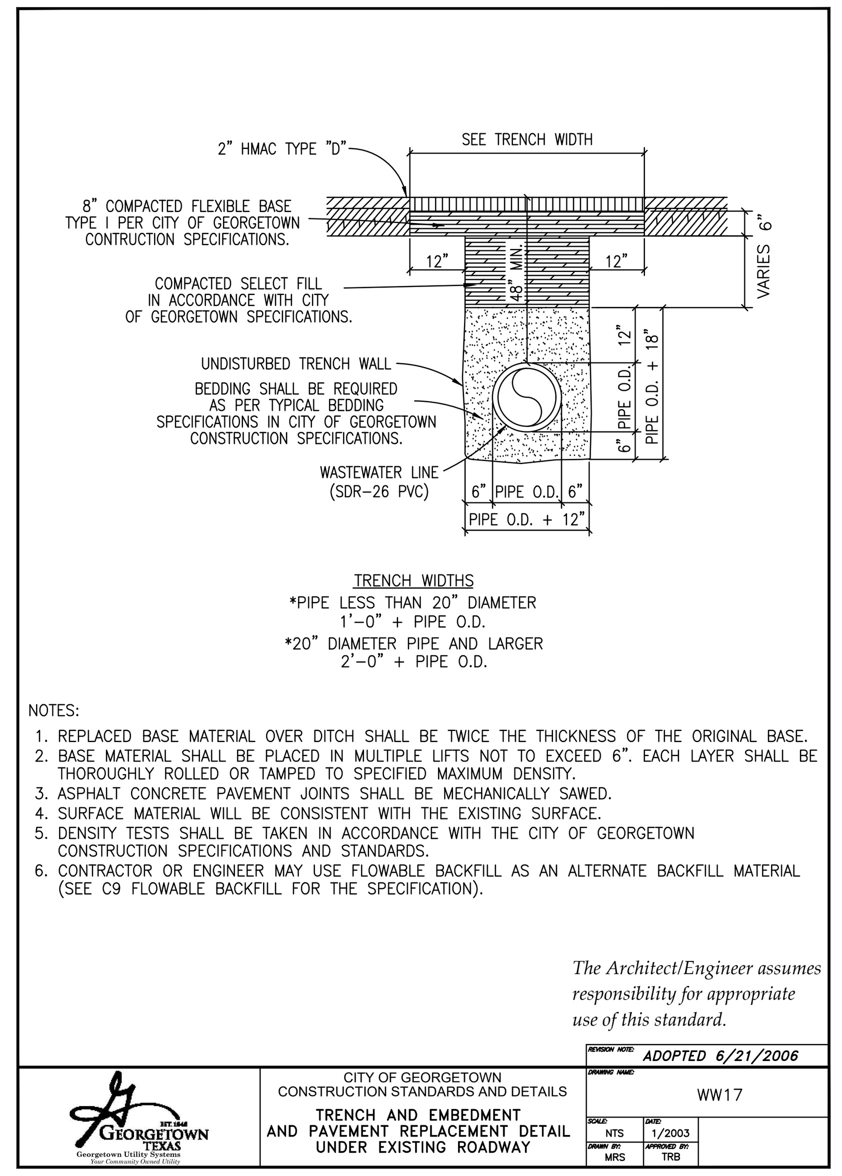
City of Georgetown
Williamson County, Texas

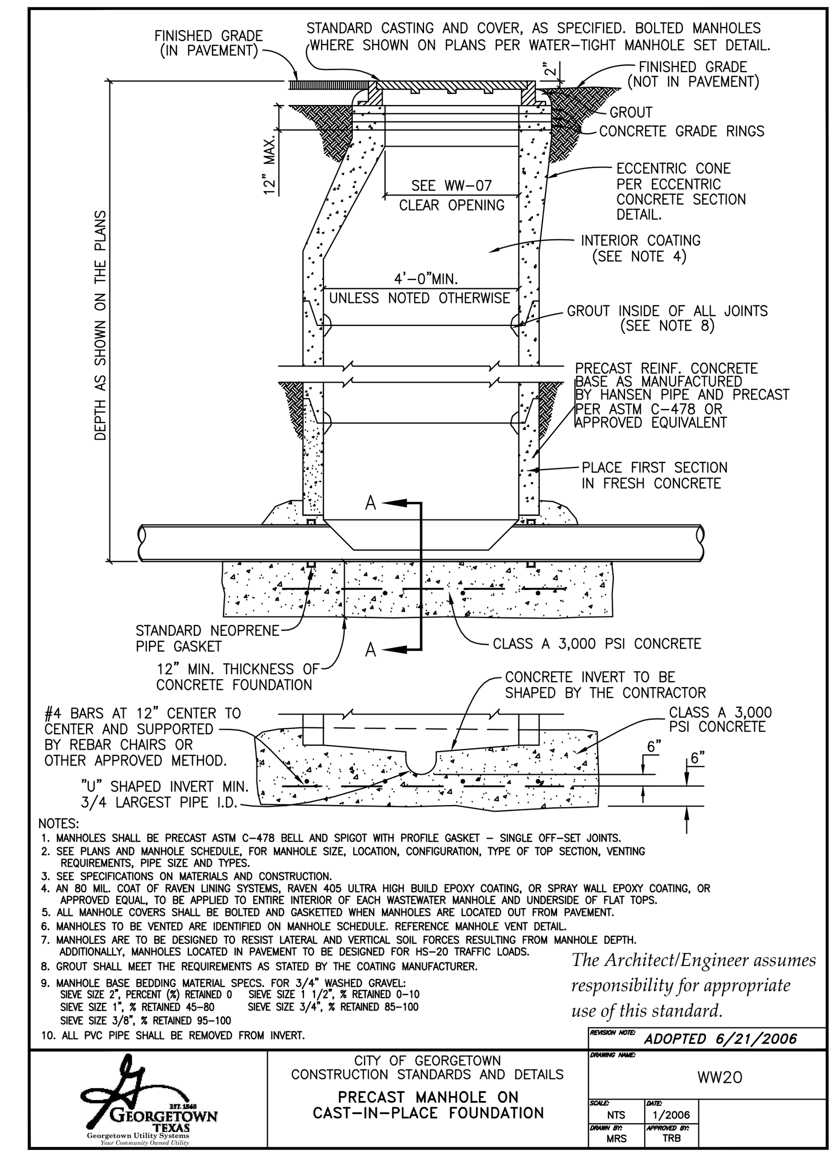
Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P:\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P:\22000-22999
Xref DWG FILE:	SOMERSET HILLS
Sheet Number:	194 of 218 sheets

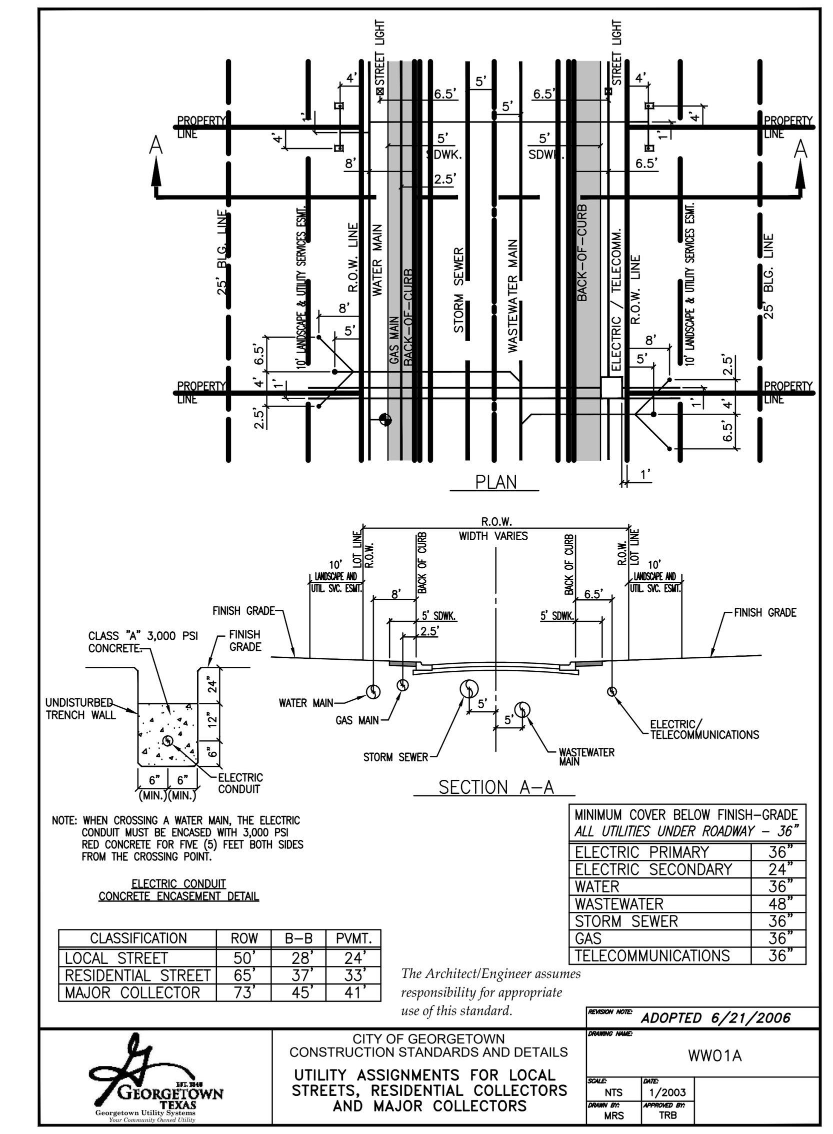
2021-21-CON

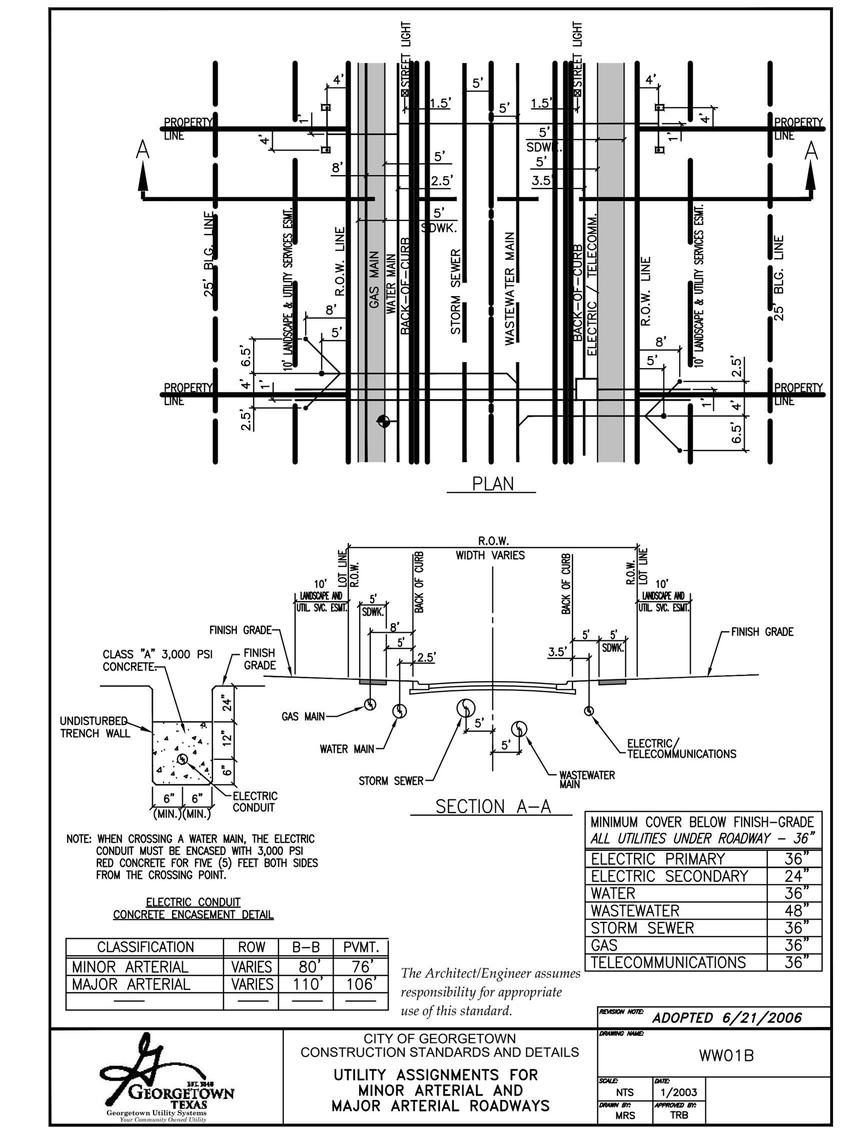
File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\194 WASTEWATER DETAILS (1 OF 3).dwg By: Brandon Montoya Date: 11/1/2021 8:32 AM

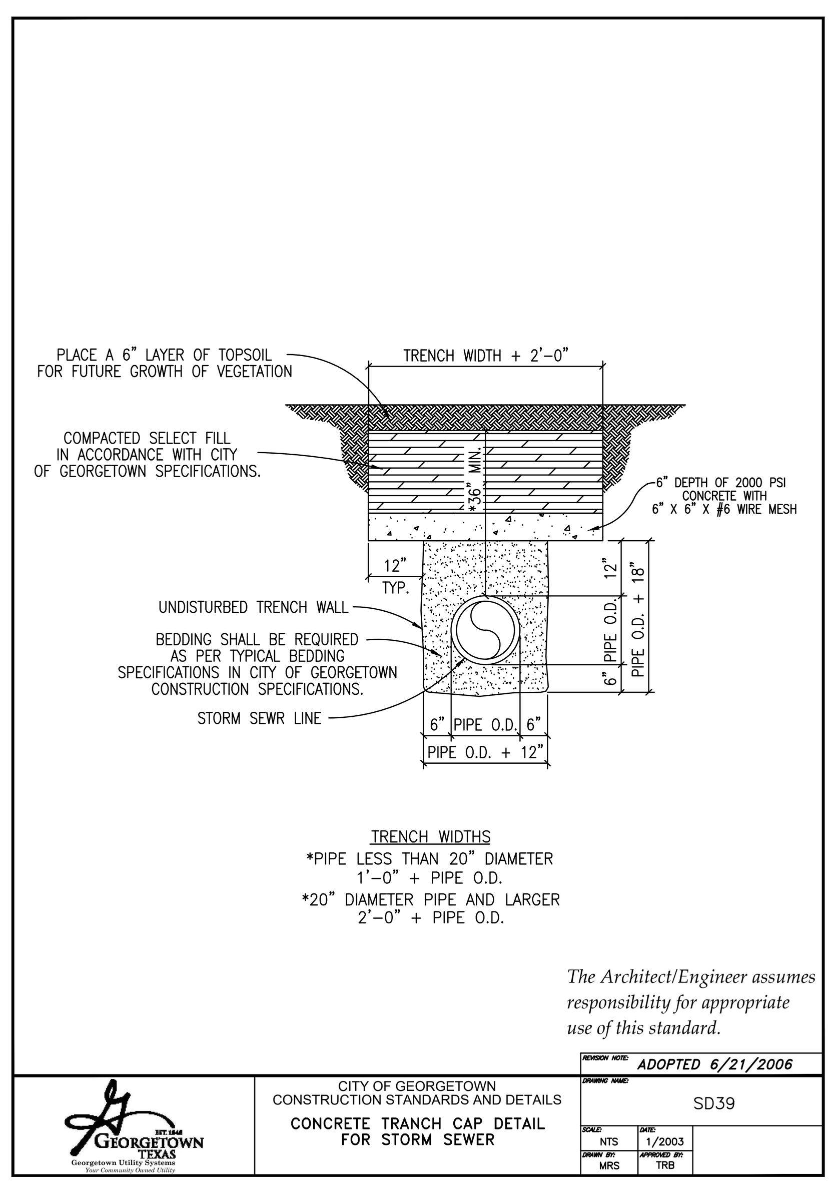


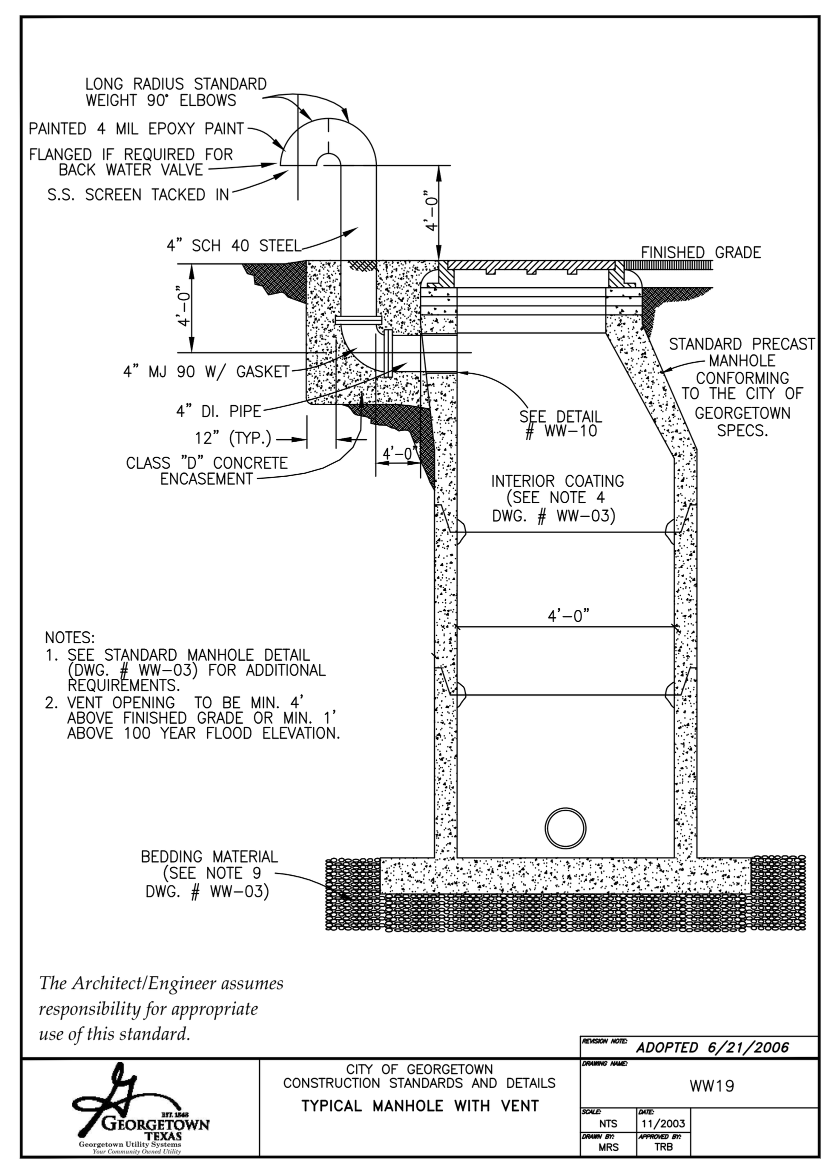


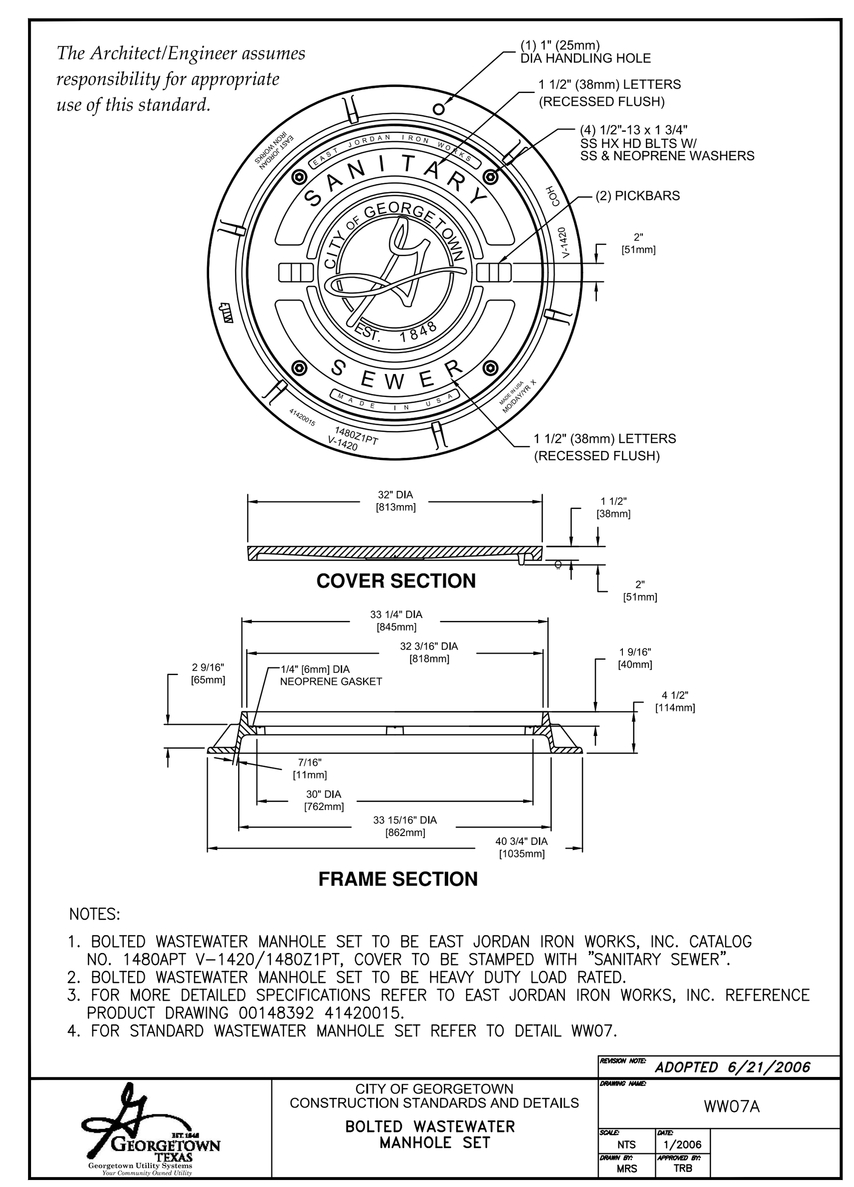


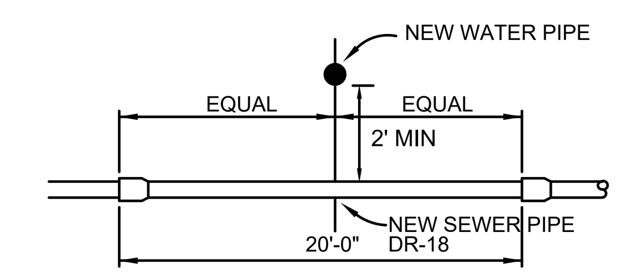








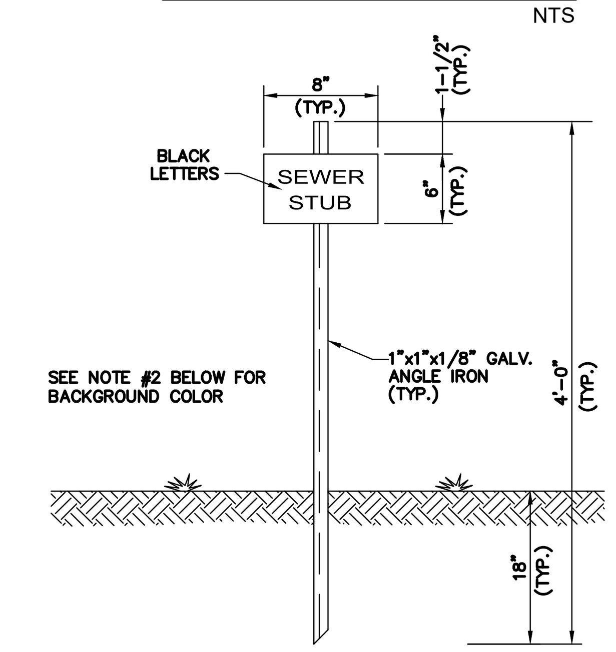




NOTE:
WASTEWATER LINE CROSSING WATER LINE WITH LESS THAN NINE FEET OF SEPARATION SHALL HAVE A FULL JOINT OF C900 DR-18 (250 PSI) PVC PIPE CONFORMING TO ASTM D1784 MUST BE CENTERED ON THE WATERLINE. JOINTS MUST BE DESIGNED TO SEAL AT ATMOSPHERIC PRESSURE PER TAC 217.53(d)(7)(A)(iv) AND MEET ASTM D3139.

WATER-SEWER CROSSING

NTS

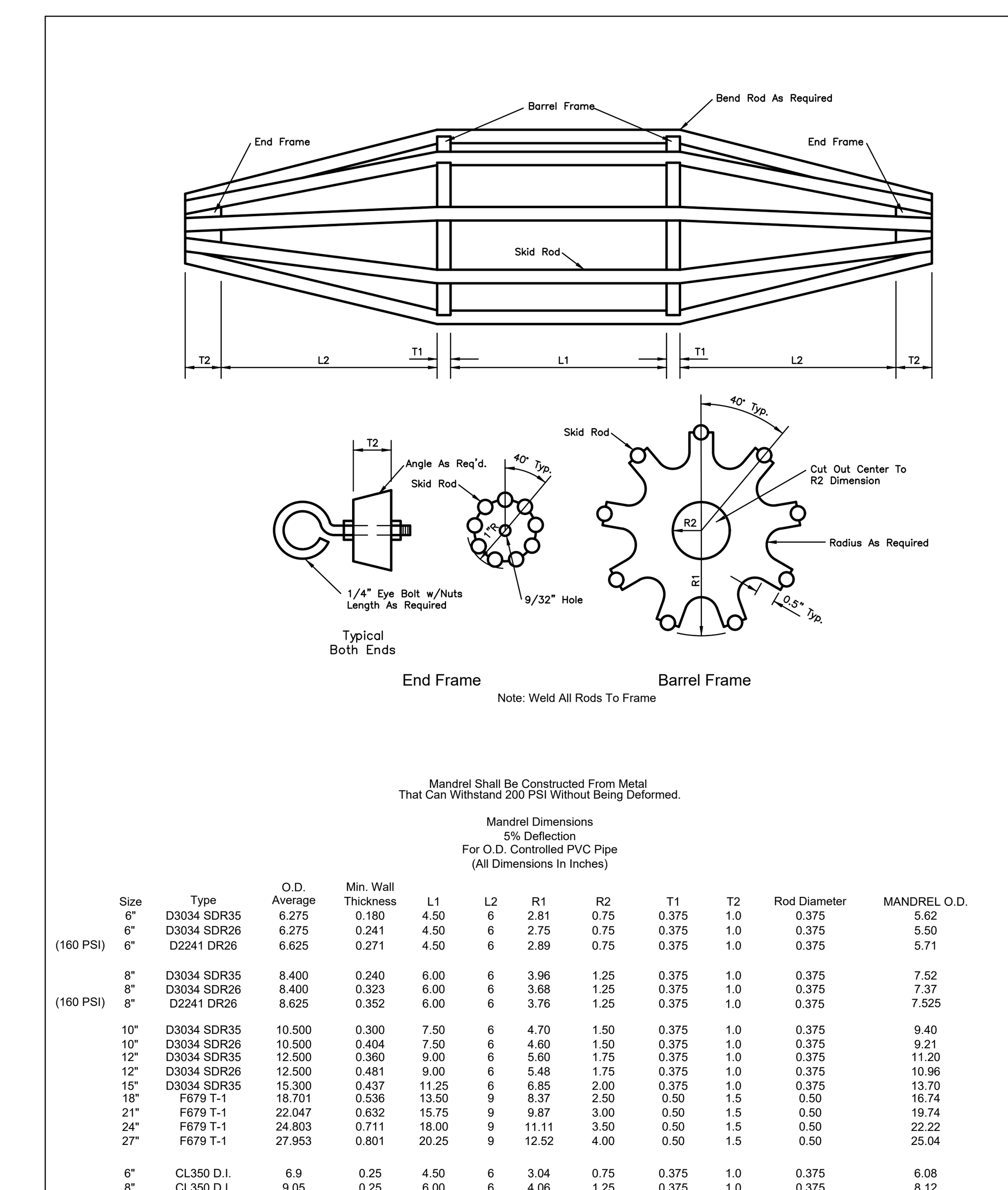


SEWER STUB MARKERS

(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



Typical Mandrel Details

No Scale

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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 05-15-2021
DESIGNED BY: DATE
SJT, AEC, BLM 05-15-2021
DRAWN BY: DATE
05-15-2021
CHECKED BY: DATE
05-15-2021
APPROVED BY: DATE

STATE OF TEXAS — BRYAN ERIC MOORE — 98920 — LICENSED PROFESSIONAL ENGINEER — 11/11/21

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

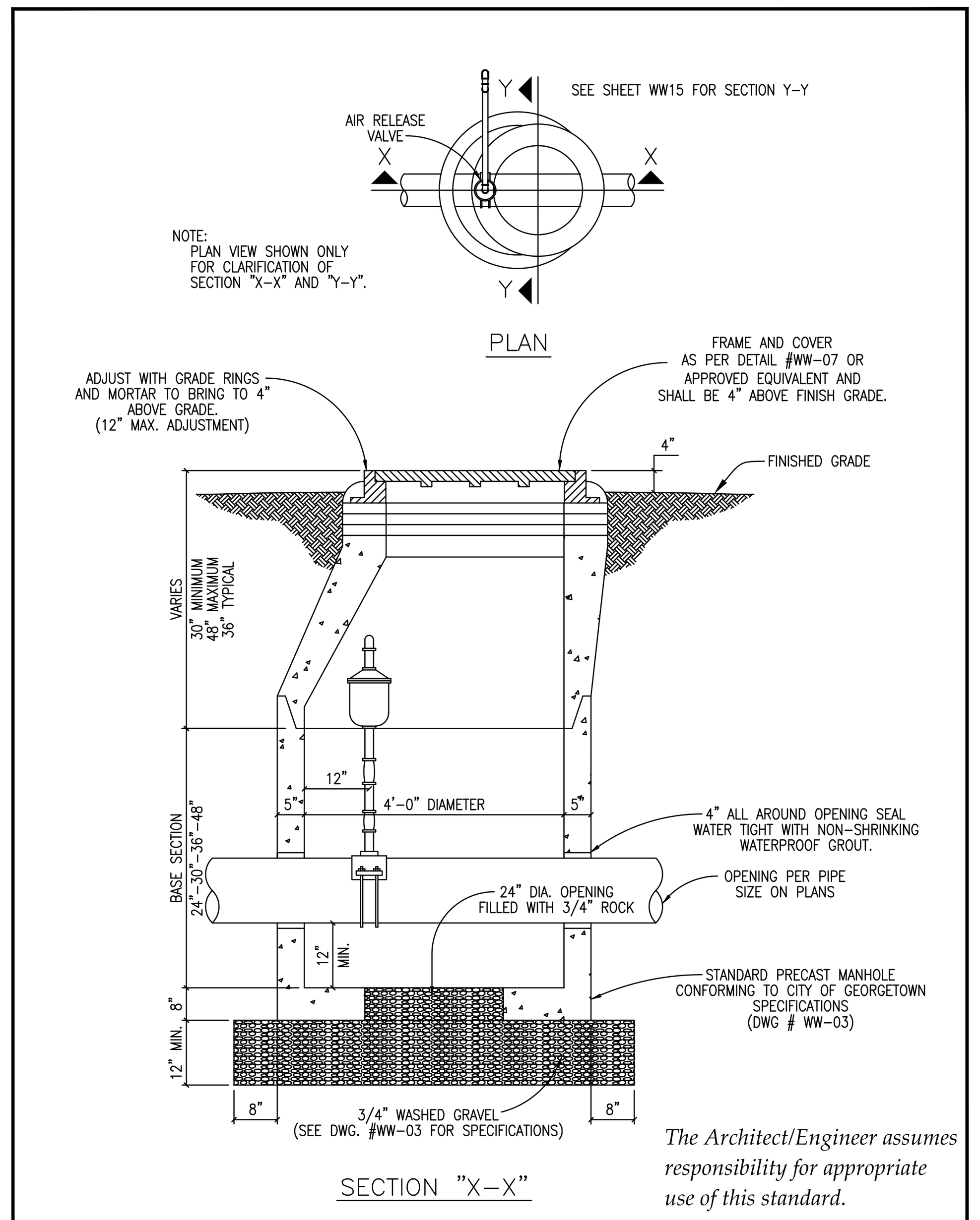
WASTEWATER DETAILS (2 OF 3)

SOMERSET HILLS PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number: 22226x
SCALE: AS NOTED
Project Path: P:\22000-22999
Project Name: 22226-xSOMERSET HILLS
Drawing Path: P:\22000-22999
Xref DWG FILE: SOMERSET HILLS
Sheet Number: 195 of 218 sheets

2021-21-CON

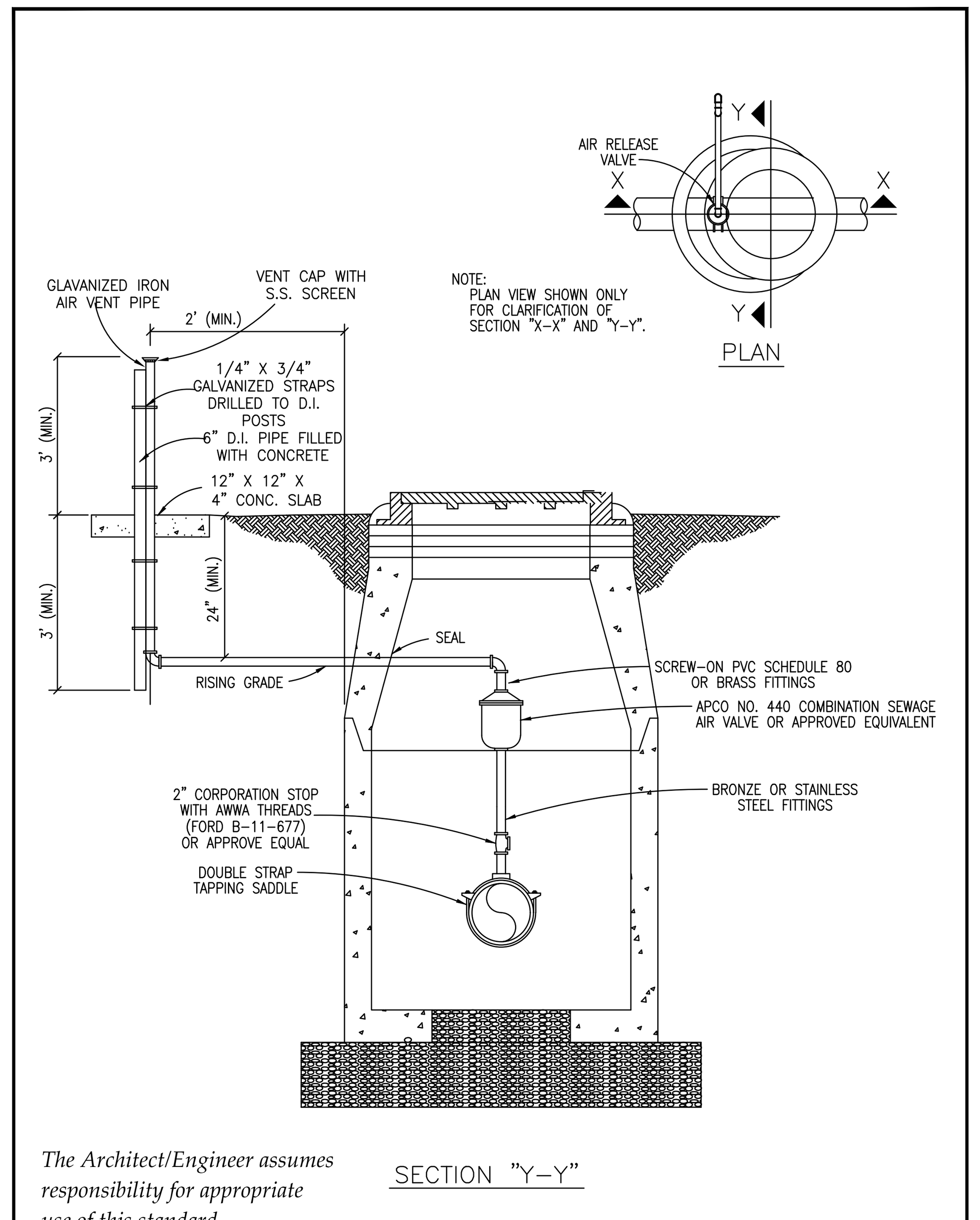


The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD AIR RELEASE VALVE FOR FORCE MAIN

DRAWING NAME: WW14
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

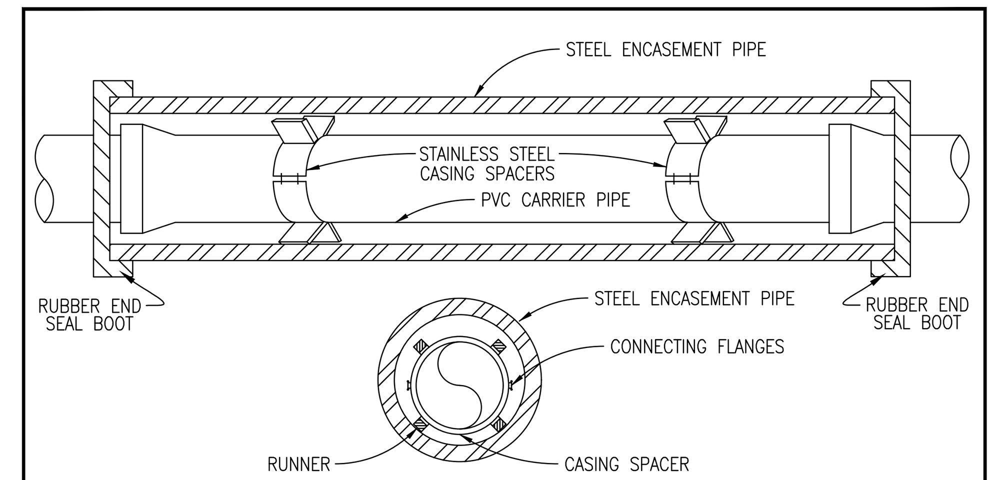


The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD AIR RELEASE VALVE FOR FORCE MAIN

DRAWING NAME: WW15
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB



NOTES:

1. CASING SPACERS SHALL BE BOLT ON STYLE WITH A SHELL MADE IN TWO SECTIONS OF HEAVY T–304 STAINLESS STEEL. CONNECTING FLANGES SHALL BE RIBBED FOR EXTRA STRENGTH. CASING SPACERS SHALL BE MADE BY CASCADE WATERWORKS MFG. CO. OR APPROVED EQUAL.
2. CASING SPACERS SHALL HAVE RUNNERS MADE OF ULTRA HIGH MOLECULAR WEIGHT POLYMER, WITH A MINIMUM HEIGHT OF 2 INCHES.
3. DO NOT USE WEDGES BETWEEN TOP OF PVC CARRIER PIPE AND INSIDE OF CASING TO KEEP PVC FROM MOVING.
4. PRIOR TO INSERTING PVC CARRIER PIPE, ANY WATER SHOULD BE PUMPED OUT OF THE CASING PIPE SO THAT NO MORE THAN A FEW INCHES OF WATER REMAINS.
5. SPACERS WILL BE REQUIRED WITHIN AT LEAST 3 FEET FROM BOTH OPENINGS OF THE ENCASEMENT PIPE AND SPACED NO GREATER THAN 6 FEET THROUGHOUT THE ENCASEMENT PIPE.
6. ENCASEMENT PIPE SHALL BE SMOOTH STEEL 35,000 PSI YIELD STRENGTH WITH THICKNESS ACCORDING TO THE FOLLOWING TABLE:
7. WHEN CASING IS REQUIRED UNDER PAVEMENT WITHIN THE R.O.W., THE CASING SHALL EXTEND OUT TO WITHIN 4' INSIDE OF THE R.O.W. LINE, ON BOTH SIDES.
8. ALL JOINTS SHALL BE RESTRAINED ON PVC CARRIER PIPE.

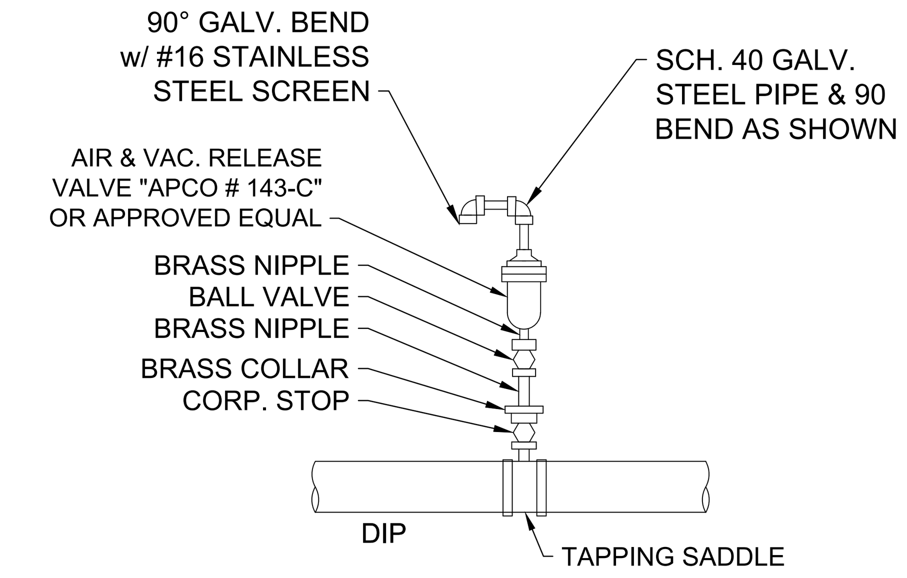
PIPE SIZE–CARRIER (DIAMETER)	PIPE SIZE–CASING (DIAMETER)(MIN.)	MINIMUM PIPE THICKNESS (INCHES)	
6"	16"		
8"	18"	1/4	0.2500
10"	20"	5/16	0.3125
12" – 14"	24"	3/8	0.3750
16" – 18"	30"	7/16	0.4375
20"	36"	1/2	0.5000
24"	42"	1/2	0.5000
30"	48"	1/2	0.5000

The Architect/Engineer assumes responsibility for appropriate use of this standard.

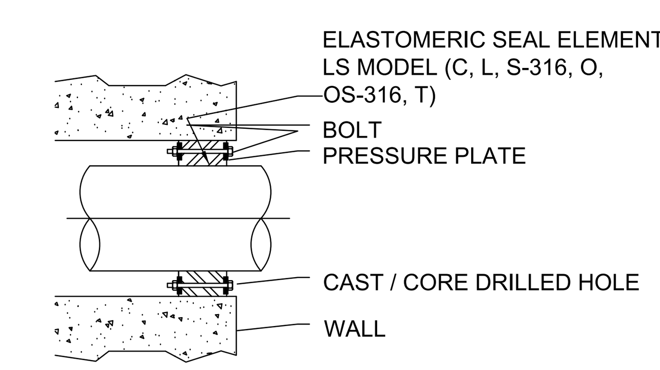
REVISION NOTE: ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
INSTALLATION OF P.V.C. PIPE THROUGH CASING

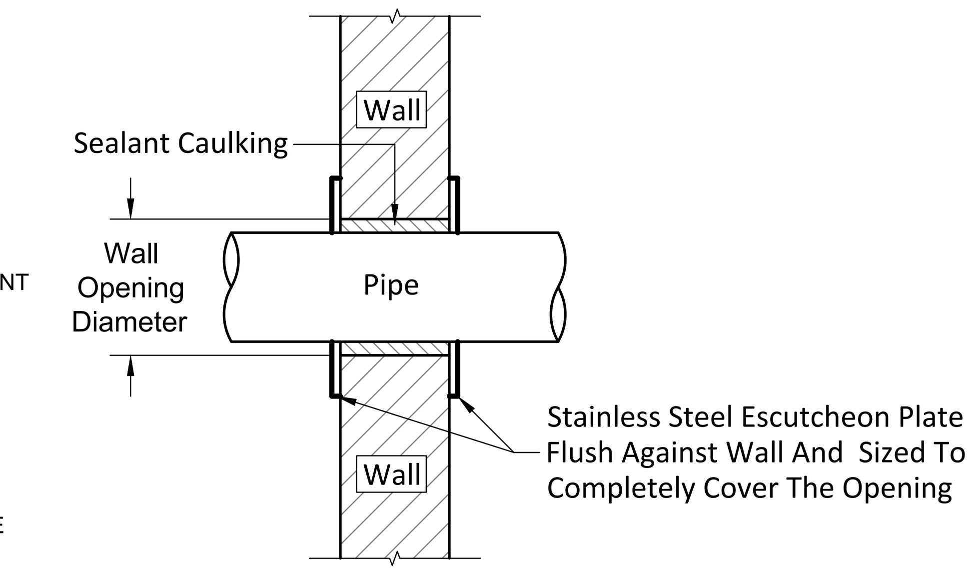
DRAWING NAME: W14
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB



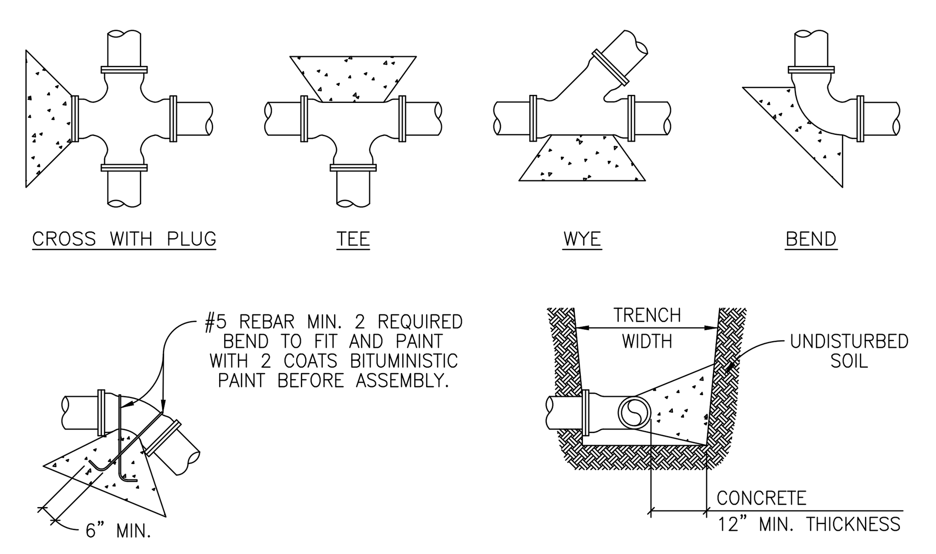
AIR RELEASE VALVE DETAIL
N.T.S



Link Seal Detail
NTS



Wall Escutcheon/Seal
NTS



*DEADMAN

TYPICAL SECTION

ALL THRUST BLOCKS SHALL BE FORMED. LAID FORMS SHALL BE INSPECTED BY THE CITY OF GEORGETOWN PRIOR TO THE POURING OF CONCRETE AND SHALL ALSO BE INSPECTED BY THE CITY OF GEORGETOWN PRIOR TO COVERING. TYPICAL LOCATIONS WHICH REQUIRE CONCRETE REACTION (THRUST) BLOCKS, FOR PRESSURE MAINS FOUR INCHES (4") AND GREATER. CONCRETE SHALL HAVE 2,500 P.S.I. MINIMUM STRENGTH AT TWENTY EIGHT (28) DAYS AND BEAR AGAINST UNDISTURBED STABLE SOILS, AREA OF CONTACT SHALL BE GOVERNED BY PIPE SIZE, MAXIMUM PRESSURE IN PIPE, AND BEARING CAPACITY OF SOIL. PROTECT FITTINGS, BOLTS, ETC. BY COVERING WITH VISQUEEN OR OTHER ACCEPTABLE MATERIAL. CONCRETE SHALL BE A MINIMUM OF TWELVE INCHES (12") THICK.

PIPE SIZE	THRUST BLOCK AREA REQUIRED	PIPE SIZE	THRUST BLOCK AREA REQUIRED	REMARKS
4"	2.0 SQ. FT.	18"	30.0 SQ. FT.	VALUES ARE FOR 90° BENDS, BASED ON 2000 P.S.F. SAFE BEARING LOAD AND PIPE PRESSURE OF 150 P.S.I. PLUS 33% SAFETY FACTOR FOR OTHER SOILS AND PRESSURES, THE AREA REQUIRED IS IN DIRECT PROPORTION.
6"	4.0 SQ. FT.	20"	37.0 SQ. FT.	
8"	6.6 SQ. FT.	24"	53.0 SQ. FT.	
10"	10.0 SQ. FT.	27"	80.0 SQ. FT.	
12"	14.0 SQ. FT.	30"	98.0 SQ. FT.	
14"	18.0 SQ. FT.	36"	127.0 SQ. FT.	
16"	24.0 SQ. FT.			

* THE ENGINEER OF RECORD SHALL CALCULATE THE SIZE OF THE DEADMAN REQUIRED AS WELL AS ANY INSTALLATION WHICH IS NOT COVERED BY THE ABOVE.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL THRUST BLOCKS FOR WATER AND FORCE MAIN

DRAWING NAME: W11
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

THESE CONSTRUCTION PLANS HAVE BEEN PREPARED TO FULFILL THE REQUIREMENTS FOR THE TCEQ FOR WATER POLLUTION ABATEMENT OVER THE EDWARDS AQUIFER. CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL DETAILED CONSTRUCTION PLAN PRIOR TO 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 utility 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	05-15-2021
DESIGNED BY:	DATE
SJT, AEC, BLM	05-15-2021
DRAWN BY:	DATE
	05-15-2021
CHECKED BY:	DATE
	05-15-2021
APPROVED BY:	DATE

STATE OF TEXAS
BRYAN ERIC MOORE
98920
LICENSED
PROFESSIONAL ENGINEER
11/11/21

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 (3 OF 3)

SOMERSET HILLS PHASES A-E

City of Georgetown
Williamson County, Texas

Project Number:	22226x
SCALE:	AS NOTED
Project Path:	P\22000-22999
Project Name:	22226-xSOMERSET HILLS
Drawing Path:	P\22000-22999 SOMERSET HILLS
Xref DWG FILE.	
Sheet Number:	196 of 218 sheets

2021-21-CON

File Name: p:\22000-22999\22226 xsomerset hills ltd\02_parcels 6&7\CAD\Plans\196 WASTEWATER DETAILS (3 OF 3).dwg By: Brandon Montoya Date: 11/1/2021 8:33 AM