

VERAMENDI SANITARY
SEWER S1 – S6
Exception Request Application

October 2020

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**EDWARDS AQUIFER
APPLICATION COVER PAGE
(TCEQ-20705)**

Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

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

Administrative Review

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

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

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.
3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.
4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

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

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.
6. If the geologic assessment was completed before October 1, 2004 and the site contains "possibly sensitive" features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

Technical Review

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

2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be clearly marked, features identified in the geologic assessment should be flagged, roadways marked and the alignment of the Sewage Collection System and manholes should be staked at the time the application is submitted. If the site is not marked the application may be returned.
3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or if not withdrawn the application will be denied and the application fee will be forfeited.
4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

Mid-Review Modifications

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

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

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

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

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

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

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

1. Regulated Entity Name: Veramendi Sanitary Sewer S1-S6					2. Regulated Entity No.: 10838364				
3. Customer Name: Veramendi PE - Darwin, LLC					4. Customer No.: 605543875				
5. Project Type: (Please circle/check one)	New		Modification		Extension		Exception		
6. Plan Type: (Please circle/check one)	WPAP	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: (Please circle/check one)	Residential		Non-residential			8. Site (acres):			
9. Application Fee:	\$3,193		10. Permanent BMP(s):						
11. SCS (Linear Ft.):	6,384.73		12. AST/UST (No. Tanks):						
13. County:	Comal		14. Watershed:			Comal River			

Application Distribution

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

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

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

Austin Region			
County:	Hays	Travis	Williamson
Original (1 req.)	—	—	—
Region (1 req.)	—	—	—
County(ies)	—	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Barton Springs/ Edwards Aquifer <input type="checkbox"/> Hays Trinity <input type="checkbox"/> Plum Creek	<input type="checkbox"/> Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	<input type="checkbox"/> Austin <input type="checkbox"/> Buda <input type="checkbox"/> Dripping Springs <input type="checkbox"/> Kyle <input type="checkbox"/> Mountain City <input type="checkbox"/> San Marcos <input type="checkbox"/> Wimberley <input type="checkbox"/> Woodcreek	<input type="checkbox"/> Austin <input type="checkbox"/> Bee Cave <input type="checkbox"/> Pflugerville <input type="checkbox"/> Rollingwood <input type="checkbox"/> Round Rock <input type="checkbox"/> Sunset Valley <input type="checkbox"/> West Lake Hills	<input type="checkbox"/> Austin <input type="checkbox"/> Cedar Park <input type="checkbox"/> Florence <input type="checkbox"/> Georgetown <input type="checkbox"/> Jerrell <input type="checkbox"/> Leander <input type="checkbox"/> Liberty Hill <input type="checkbox"/> Pflugerville <input type="checkbox"/> Round Rock

San Antonio Region					
County:	Bexar	Comal	Kinney	Medina	Uvalde
Original (1 req.)	—	✓	—	—	—
Region (1 req.)	—	✓	—	—	—
County(ies)	—	✓	—	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Trinity-Glen Rose	<input checked="" type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Comal Trinity	<input type="checkbox"/> Kinney	<input type="checkbox"/> EAA <input type="checkbox"/> Medina <input type="checkbox"/> Nueces River Auth.	<input type="checkbox"/> EAA <input type="checkbox"/> Uvalde <input type="checkbox"/> Nueces River Auth.
City(ies) Jurisdiction	<input type="checkbox"/> Castle Hills <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Helotes <input type="checkbox"/> Hill Country Village <input type="checkbox"/> Hollywood Park <input type="checkbox"/> San Antonio (SAWS) <input type="checkbox"/> Shavano Park	<input type="checkbox"/> Bulverde <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Garden Ridge <input checked="" type="checkbox"/> New Braunfels <input type="checkbox"/> Schertz <input type="checkbox"/> Spring Branch	NA	<input type="checkbox"/> 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.

Dennis Rion, P.E.

Print Name of Customer/Authorized Agent

9/22/2020

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 (TCEQ-0585)**

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: Dennis R. Rion, P.E.

Date: 9/22/2020

Signature of Customer/Agent:



Project Information

1. Regulated Entity Name: Veramendi Sanitary Sewer S1-S6
2. County: Comal
3. Stream Basin: Blieders Creek
4. Groundwater Conservation District (If applicable): Comal Trinity

5. Edwards Aquifer Zone:

- Recharge Zone
 Transition Zone

6. Plan Type:

- | | |
|---|---|
| <input type="checkbox"/> WPAP | <input type="checkbox"/> AST |
| <input checked="" type="checkbox"/> SCS | <input type="checkbox"/> UST |
| <input type="checkbox"/> Modification | <input checked="" type="checkbox"/> Exception Request |

7. Customer (Applicant):

Contact Person: Peter James
Entity: Veramendi PE - Darwin, LLC
Mailing Address: PO Box 310699
City, State: New Braunfels, TX Zip: 78131
Telephone: (830) 660-4755 FAX: _____
Email Address: peter@asaproperties.us.com

8. Agent/Representative (If any):

Contact Person: Dennis R. Rion, P.E.
Entity: Pape-Dawson Engineers, Inc.
Mailing Address: 2000 NW Loop 410
City, State: San Antonio, Texas Zip: 78213
Telephone: (210) 375-9000 FAX: (210) 375-9010
Email Address: drion@pape-dawson.com

9. Project Location:

- The project site is located inside the city limits of _____.
- The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of New Braunfels.
- 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 TCEQ regional office turn left and proceed approximately 1.5 miles to IH-35 north and turn left. Travel approximately 17.5 miles to exit 189 toward TX-337 and turn left. Proceed approximately 3.5 miles on TX-337 Loop W. The project site is located Approx. 0.3 miles NW of River Rd. and TX- 337 intersection

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: once advised by TCEQ staff of site inspection

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.

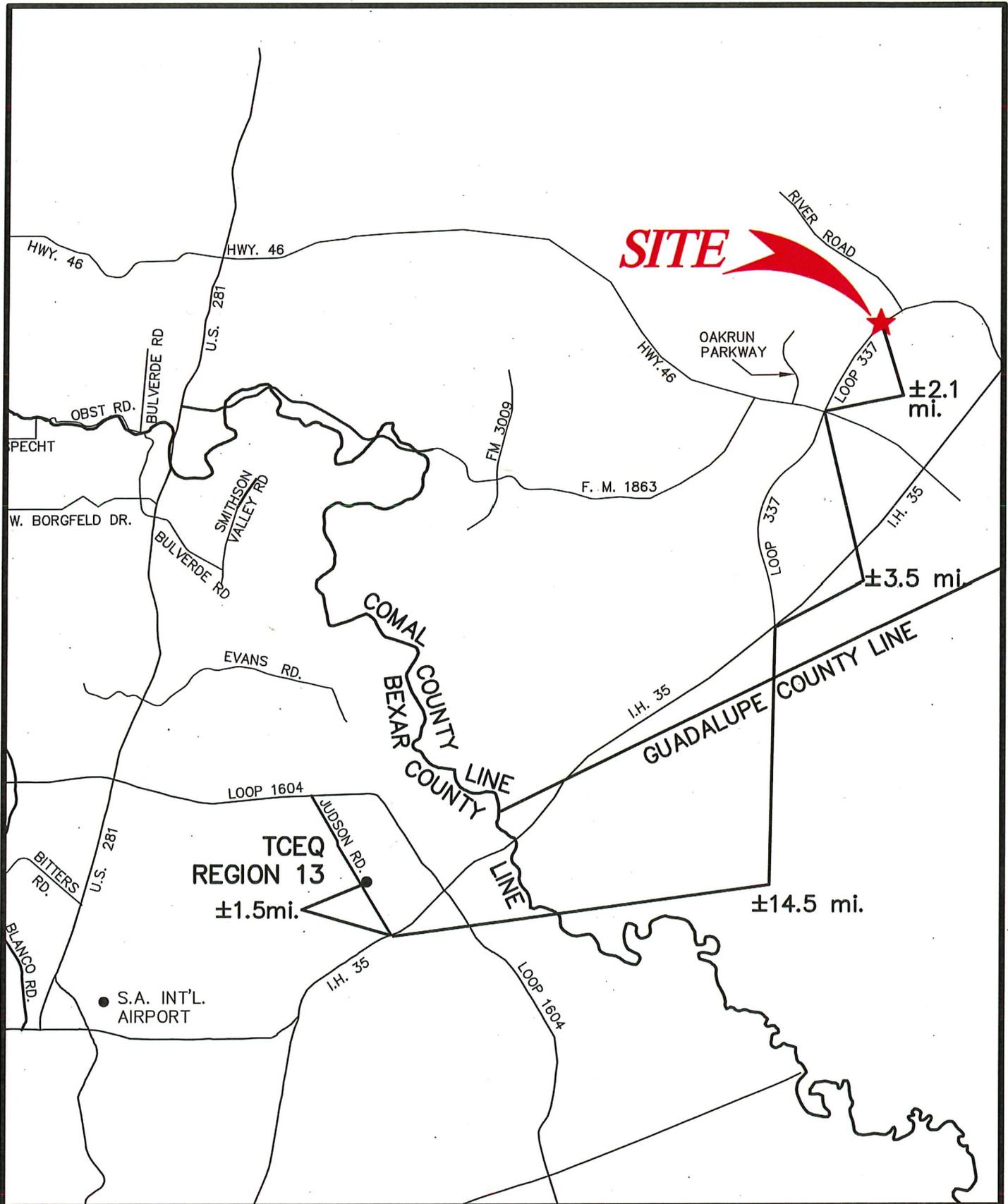
Administrative Information

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.

ATTACHMENT A

VERAMENDI SANITARY SEWER S1-S6
New Braunfels, Texas
Sewage Collection System

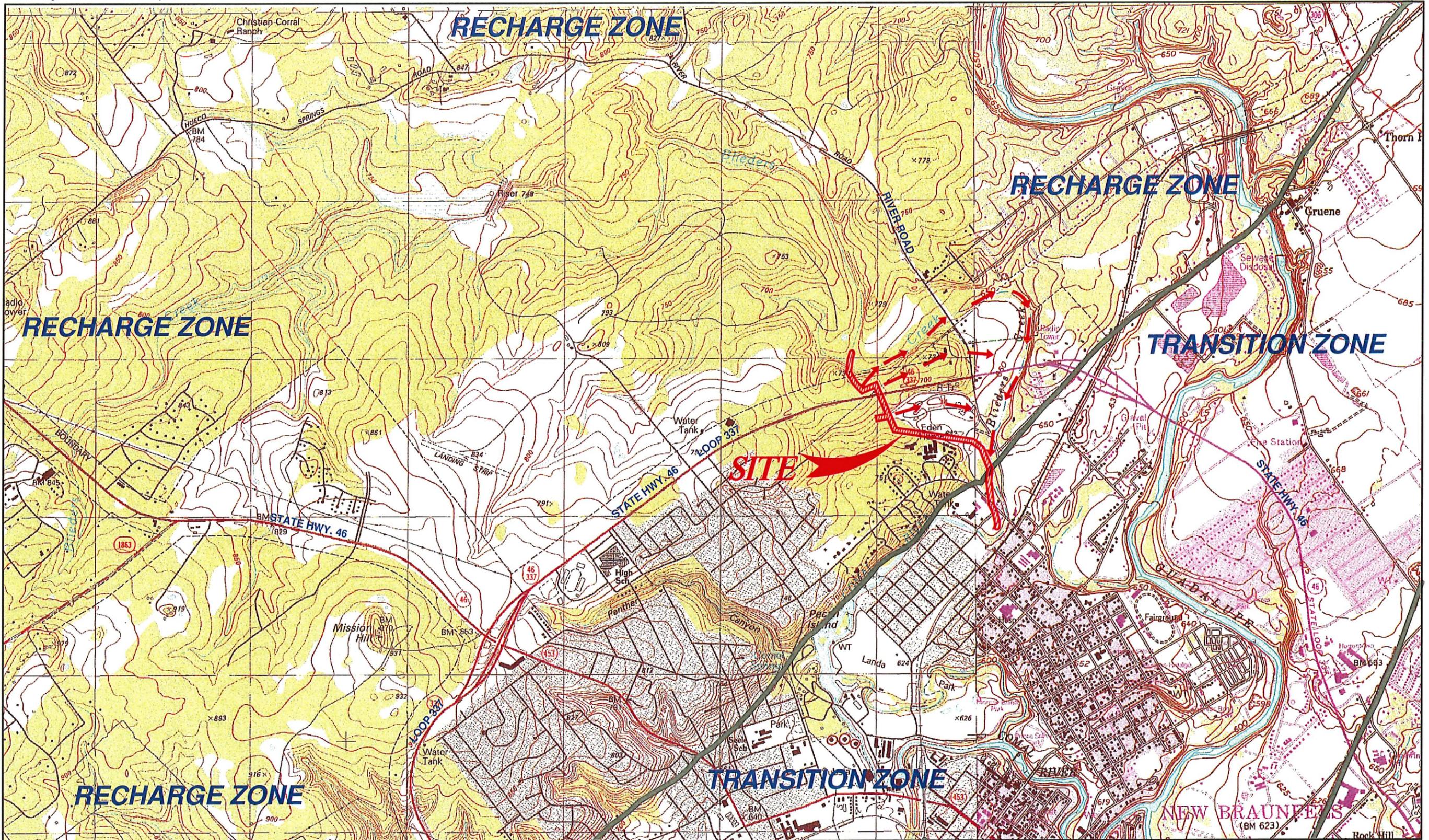


ATTACHMENT B

VERAMENDI SANITARY SEWER S1-S6
New Braunfels, Texas
Sewage Collection System



SCALE: 1" = 2000'



Date: Aug 22, 2019, 10:29am User ID: Rollvarez
File: P:\16 20156 Design Environmental\SCS\SCS_00762056.dwg

NEW BRAUNFELS WEST, TEXAS QUADRANGLE
NEW BRAUNFELS EAST, TEXAS QUADRANGLE
DRAINAGE FLOW → → →
Pape-Dawson Engineers, Inc.

USGS/EDWARDS RECHARGE ZONE MAP

ATTACHMENT B

ATTACHMENT C

VERAMENDI SANITARY SEWER S1-S6

General Information Form (TCEQ-0587)

Attachment C – Project Narrative

Veramendi Sanitary Sewer S1-S6 is part of an overall development to be constructed on an approximate 1,567-acre drainage area which is located approximately 0.3 miles northwest and southwest of the River Rd. and Tx-337 Loop intersection. The site is located within the Extra-Territorial Jurisdiction of the City of New Braunfels in Comal County, Texas, and entirely over the Edwards Aquifer Recharge Zone. A Water Pollution Abatement Plan (WPAP) application will be submitted at a later time for development of portions of these areas but only sewer line installation is proposed at this time and regulated activities will be contained within the sewer envelope. A portion of the sewer main will extend into the Edwards Aquifer Contributing Zone prior to the 24" Line at station 16+75.00 located at manhole MH-5 and is not part of this application.

The Veramendi Sanitary Sewer S1-S6 Sewage Collection System (SCS) Application was approved by the Texas Commission on Environmental Quality on October 17, 2019 (ID No. 13000985) for the construction of a total of approximately 6384.73 linear feet (LF) of gravity sewer main to primarily serve a mixed-use development. The alignment will consist of approximately 5,157.3 LF of 24-inch (24") PVC, SDR 26; 29.0 LF of 21-inch (21") PVC, SDR 26; and 1,198.43 LF of 12-inch (12") PVC, SDR 26 gravity sewer main. The 12" sanitary sewer will tie into two existing New Braunfels Utilities (NBU) manholes located on-site. Regulated activities approved include excavation, construction of sewer mains, backfill and compaction. Approximately 14.66 acres of the 1,567-acre drainage area may be disturbed as identified by the limits of the fifty-foot (50') SCS/GA envelope shown on the plans. A 975 LF section of sewer main is approved to be microtunneled and contained within a 42" steel casing under the existing TX-337. This exception is being submitted due to a design change with this section of approved sewer main being proposed at a deeper bury depth. No additional changes are proposed to the previously-approved plan. Refer to Sheets C2.02-C2.05 included in the exhibits section for additional details.

Based on an assumption of 5,495 LUE's, approximately 1.15 million gallons per day (MGD) (average flow) of domestic wastewater will flow through this SCS. The sewage flow will be disposed of by conveyance to the existing Old Gruene Water Wastewater Treatment Center operated by the New Braunfels Utilities (NBU). No naturally-occurring sensitive features were identified in the Geologic Assessment.

**GEOLOGIC ASSESSMENT
FORM (TCEQ-0585)**

Frost GeoSciences

Geotechnical • Construction Materials
Testing • Environmental

13402 Western Oak
Helotes, Texas 78023
Phone (210) 372-1315
Fax (210) 372-1318
www.frostgeosciences.com
TBPE Firm Registration # F-9227
TBPE Firm Registration # 50040

January 18, 2019

THE VERAMENDI SUBDIVISION: PE-ADELAIDE LLC C/O ASA PROPERTIES
117 W. Mill Street
New Braunfels, Texas 78130

Attn: Ms. Tiffany Lacey, Vice President of Designs & Approvals

Re: Geologic Site Assessment (SCS)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The Veramendi Subdivision, Outfall Sewer Line
New Braunfels, Texas

Frost GeoSciences, Inc. Control # FGS-E18221

To Whom it May Concern:

Attached is a copy of the Geologic Assessment Report completed for the above referenced project site as it relates to 30 TAC §213.5(b)(3), effective June 1, 1999. Our investigation was conducted and this report was prepared in general accordance with the "Instructions to Geologists", TCEQ-0585-Instructions (Rev. 10-1-04). The results of our investigation, along with any recommendations for Best Management Practices (BMP's), are provided in the following report.

If you have any questions regarding this report, or if Frost GeoSciences, Inc. may be of additional assistance to you on this project, please feel free to call our office. It has been a pleasure to work with you and we wish to thank you for the opportunity to be of service to you on this project. We look forward to being of continued service.



Sincerely,
Frost GeoSciences, Inc.

A handwritten signature in black ink that reads "Steve Frost".

Steve Frost, C.P.G., P.G.
President, Senior Geologist

Distribution: (1) THE VERAMENDI SUBDIVISION: PE-ADELAIDE LLC C/O ASA PROPERTIES
(5) Pape Dawson Engineers

Table of Contents

GEOLOGIC ASSESSMENT FORM 1

STRATIGRAPHIC COLUMN 4

GEOLOGIC ASSESSMENT TABLE 5

LOCATION 6

METHODOLOGY 6

RESEARCH & OBSERVATIONS 7

 7.5 Minute Quadrangle Map Review 7

 Recharge/Transition Zone 7

 100-Year Floodplain 8

 Soils 8

 Narrative Description of the Site Geology 10

BEST MANAGEMENT PRACTICES 13

DISCLAIMER 13

REFERENCES 13

APPENDIX

A: Site Location Plates

 Plate 1: Site Plan

 Plate 2: Street Map

 Plate 3: USGS Topographic Map

 Plate 4: Official Edwards Aquifer Recharge Zone Map

 Plate 5: FEMA Flood Map

 Plate 6: 1973 Aerial Photograph, 1"=1000'

 Plate 7: Geologic Map

 Plate 8: 2018 Aerial Photograph, 1"=500'

 Plate 9: 2018 Aerial Photograph with PRF's, 1"=100M

B: Site Inspection Photographs

C: Site Geologic Map

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: Steve Frost, C.P.G., P.G. Telephone: (210) 372-1315

Date: January 18, 2019 Fax: (210) 372-1318

Representing: Frost GeoSciences, Inc.

Signature of Geologist:



Regulated Entity Name: Veramendi, Sanitary Sewer Outfall Line

Project Information

1. Date(s) Geologic Assessment was performed: December 14, 2018

2. Type of Project:

- | | |
|---|------------------------------|
| <input type="checkbox"/> WPAP | <input type="checkbox"/> AST |
| <input checked="" type="checkbox"/> SCS | <input type="checkbox"/> 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)
CrD	C/D	0 to 1
Pt	C/D	0 to 2
Or	C/D	1 to 2
LeA	C/D	3 to 4
LeB	C/D	3 to 4

* 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" = 200 '
 Site Geologic Map Scale: 1" = 200 '
 Site Soils Map Scale (if more than 1 soil type): 1" = 1000 '
- 9. Method of collecting positional data:
 - Global Positioning System (GPS) technology.
 - Other method(s). Please describe method of data collection: 2018 Aerial Photograph
- 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.

Stratigraphic Column

[Hydrogeologic subdivisions modified from Maclay and Small (1976); groups, formations, and members modified from Rose (1972); lithology modified from Dunham (1962); and porosity type modified from Choquette and Pray (1970). CU, confining unit; AQ, aquifer]

Hydrogeologic subdivision	Group, formation, or member	Hydro-logic function	Thickness (feet)	Lithology	Field Identification	Cavern development	Porosity/permeability type					
Upper Cretaceous	Upper confining units	Eagle Ford Group	CU	30 - 50	Brown, flaggy shale and argillaceous limestone	Thin flagstones; petroliferous	None	Primary porosity lost/ low permeability				
		Buda Limestone	CU	40 - 50	Buff, light gray, dense mudstone	Porcelaneous limestone with calcite-filled veins	Minor surface karst	Low porosity/low permeability				
		Del Rio Clay	CU	40 - 50	Blue-green to yellow-brown clay	Fossiliferous; <i>Hymatogyra arietina</i>	None	None/primary upper confining unit				
Lower Cretaceous	Edwards aquifer	Edwards Group	Kainer Formation	I	Georgetown Formation	Karst AQ; not karst CU	2 - 20	Reddish-brown, gray to light tan marly limestone	Marker fossil; <i>Waconella wacoensis</i>	None	Low porosity/low permeability	
				II	Person Formation	Cyclic and marine members, undivided	AQ	80 - 90	Mudstone to packstone; <i>miliolid</i> grainstone; chert	Thin graded cycles; massive beds to relatively thin beds; crossbeds	Many subsurface; might be associated with earlier karst development	Laterally extensive; both fabric and not fabric/water-yielding
				III		Leached and collapsed members, undivided	AQ	70 - 90	Crystalline limestone, mudstone to grainstone; chert; collapsed breccia	Bioclastic iron-stained beds separated by massive limestone beds; stromatolitic limestone	Extensive lateral development; large rooms	Majority not fabric one of the most permeable
				IV		Regional dense member	CU	20 - 24	Dense, argillaceous mudstone	Wispy iron-oxide stains	Very few; only vertical fracture enlargement	Not fabric/low permeability; vertical barrier
				V	Kainer Formation	Grainstone member	AQ	50 - 60	<i>Miliolid</i> grainstone; mudstone to wackestone; chert	White crossbedded grainstone	Few	Not fabric/ recrystallization reduces permeability
				VI		Kirschberg evaporite member	AQ	50 - 60	Highly altered crystalline limestone; chalky mudstone; chert	Boxwork voids, with neospar and travertine frame	Probably extensive cave development	Majority fabric/one of the most permeable
				VII		Dolomitic member	AQ	110 - 130	Mudstone to grainstone; crystalline limestone; chert	Massively bedded light gray, <i>Toucasia</i> abundant	Caves related to structure or bedding planes	Mostly not fabric; some bedding plane-fabric/water-yielding
				VIII		Basal nodular member	Karst AQ; not karst CU	50 - 60	Shaly, nodular limestone; mudstone and <i>miliolid</i> grainstone	Massive, nodular and mottled, <i>Exogyra texana</i>	Large lateral caves at surface; a few caves near Cibolo Creek	Fabric; stratigraphically controlled/large conduit flow at surface; no permeability in subsurface
					Lower confining unit	Upper member of the Glen Rose Limestone	CU; evaporite beds AQ	350 - 500	Yellowish tan, thinly bedded limestone and marl	Stair-step topography; alternating limestone and marl	Some surface cave development	Some water production at evaporite beds/relatively impermeable

GEOLOGIC ASSESSMENT TABLE PROJECT NAME: The Veramendi Subdivision, Outfall Sewer Line

FEATURE	LOCATION		FEATURE CHARACTERISTICS										EVALUATION		PHYSICAL SETTING			
	2*	3*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10	11	12
	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	< 1.6	
S-67	29° 43' 58.80"	98° 07' 59.03"	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37	X	Streambed
S-68	29° 43' 50.12"	98° 07' 59.73"	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37	X	Streambed
S-70	29° 43' 47.29"	98° 07' 58.68"	O _{VR}	5	Kep	3	15	2	-	-	3 / 1	0.06	N	9	14	14	X	Floodplain
S-71	29° 43' 46.28"	98° 07' 57.24"	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37	X	Streambed
S-73	29° 43' 46.11"	98° 07' 55.33"	SC	20	Kep	1	1.5	6+	-	-	-	-	N	9	29	29	X	Cliff
S-74	29° 43' 46.92"	98° 07' 51.27"	SCZ	30	Kep	30	600	-	-	-	-	-	N/O/F	9	39	39	X	Floodplain
S-111	29° 43' 18.09"	98° 07' 24.55"	MB	30	Q1	3	3	?	-	-	-	-	X	7	37	37	X	Floodplain
S-112	29° 43' 27.56"	98° 07' 26.75"	F	20	Kep/Q1	-	-	-	-	-	-	-	F	7	29	29	X	Floodplain

* DATUM 1983 North American Datum (NAD83)

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 understand 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 213.

Steve M. Frosi

Signature

Date January 18, 2019

Sheet 1 of 1



LOCATION

The project site consists of a 50 foot boundary around the proposed sewer line associated with the The Veramendi Subdivision Development, Outfall Sewer Line in New Braunfels, Texas. An overall view of the area is shown on copies of the site plan, a street map, the USGS Topographic Map, the Official Edwards Aquifer Recharge Zone Map, the Flood Insurance Rate Map (FIRM), a 1973 aerial photograph at a scale of 1"=1000', a geologic map, a 2018 aerial photograph at a scale of 1"=500', and a 2018 aerial photograph at a scale of 1"=100M, Plates 1 through 9 in Appendix A.

METHODOLOGY

The Geologic Assessment was performed by Mr. Steve Frost, C.P.G., President and Senior Geologist with Frost GeoSciences, Inc. Mr. Frost is a Licensed Professional Geoscientist in the State of Texas (License # 315) and is a Certified Professional Geologist with the American Institute of Professional Geologist (Certification # 10176).

Frost GeoSciences, Inc. researched the geology of the area in the immediate vicinity of the project site. The research included, but was not limited to, the Geologic Atlas of Texas, San Antonio Sheet, FIRM maps, Edwards Aquifer Recharge Zone Maps, USGS 7.5 Minute Quadrangle Maps, the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle, the USGS Water-Resources Investigations Report 94-4117, and the USDA Soil Survey of Comal & Hays County, Texas.

After reviewing the available information, a field investigation was performed to identify any geologic or man-made potential recharge features. A transect spacing of approximately 50 feet or less, depending on vegetation thickness, was used to inspect the project site. A 2018 aerial photograph, in conjunction with a hand held Global Positioning System with an Estimated Potential Error of 10 feet, was used to navigate around the property and identify the locations of potential recharge features, as recommended in the "Instructions to Geologists", TCEQ-0585-

Instructions (Rev. 10-1-04). The locations of any potential recharge features noted in the field were identified with blue and white flagging. The flagging is numbered with the same potential recharge feature I.D. # that is used on the Site Geologic Map in Appendix C of this report. The Site Geologic Map indicating the limits of the project site is included in Appendix C. A copy of a 2018 aerial photograph at an approximate scale of 1"=100M, indicating the locations of the potential recharge features, is included on Plate 9 in Appendix A. The Geologic Assessment Form (Rev. 2-11-15), Stratigraphic Column and the Geologic Assessment Table have been filled with the appropriate information for this project site and are included on pages 1-5 of this report.

RESEARCH & OBSERVATIONS

7.5 Minute Quadrangle Map Review

According to the USGS 7.5 Minute Quadrangle Maps, New Braunfels West, Texas Sheet (1988), and New Braunfels East, Texas Sheet (1994), the elevation of the project site ranges from 710 feet in the central portion of the project site near Loop 337 to 630 feet in the southern portion of the site near Lakeview Blvd. These elevations are calculated above mean sea level (AMSL). Overall, the surface runoff from the project site flows to the east and south into Blieders Creek. A copy of the above referenced USGS 7.5 Minute Quadrangle Map indicating the location of the project site, is included in this report on Plate 3 in Appendix A.

Recharge / Transition Zone

According to the Official Edwards Aquifer Recharge Zone Maps, New Braunfels West, Texas Sheet (2014) and New Braunfels East, Texas Sheet (2014), the project site is located within the Recharge Zone and Transition Zone of the Edwards Aquifer. A copy of the Official Edwards Aquifer Recharge Zone Map, New Braunfels West, Texas Sheet (2014) and New Braunfels East, Texas Sheet (2014), indicating the location of the project site, is included on Plate 4 in Appendix A.

100-Year Floodplain

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for Comal County, Texas, Community Panel Numbers 48091C0435F and 48091C0455F (Revised 9/02/09) was reviewed to determine if the project site is located in areas prone to flooding. A review of the above-mentioned panel indicates that portions of the project site are located within the 100 year floodplain. The project site is located within Zone X and Zone AE. According to the panel legend, Zone X represents areas determined to be outside the 0.2% annual chance floodplain. Zone AE represents areas determined to be within the 100 year floodplain where floodplain elevations have been determined. A copy of the Comal County, Texas, FIRM maps, indicating the location of the project site, is included in this report on Plate 5 in Appendix A.

Soils

According to the United States Department of Agriculture, Soil Conservation Service, Soil Survey of Comal & Hays County, Texas (1982), the project site is located on the Comfort Rock Outcrop Complex, undulating (CrD), Pits (Pt), the Orif Soils frequently (Or), the Lewisville Silty Clay, 0-1% slopes (LeA), and the Lewisville Silty Clay, 1-3% slopes (LeB). A copy of the 1973 aerial photograph (approximate scale: 1"=500') from the USDA Soil Survey of Comal & Hays County, Texas indicating the location of the project site and the soil types is included on Plate 6 in Appendix A.

The Comfort-Rock outcrop complex, undulating (CrD) consists of shallow, clayey soils and Rock outcrops on the side slopes, hilltops, and ridgetops in the uplands area of the Edwards Plateau. This soil complex is composed of the Comfort extremely stony clay (~49% to 795% of the complex), the Rock outcrop (5-36% of the complex), and small amounts of the Rumble, Purves, Eckert, and Real soils. Typically, the surface layer of the Comfort soil is dark brown extremely stony clay about 6 inches thick. Stones and cobbles (some as much as 4 feet across) cover approximately 45% of the surface. The subsoil extends

to a depth of 13 inches. It's a dark reddish brown extremely stony clay. The underlying material is indurated fractured limestone. The soil is mildly alkaline and non-calcareous throughout. The soil is well drained, surface runoff is slow to medium, permeability is slow, and the available water capacity is very low. Water erosion is a slight hazard. Typically, the Rock outcrop is dolomitic limestone that is barren of soil except in narrow fractures in the rock. Some areas may have as much as 3 inches of soil on top of the outcrop. The soil is well drained and surface runoff is slow to medium. Permeability is slow. The available water capacity is very low. The rooting zone is shallow and water erosion is a slight hazard.

Pits (Pt) are excavations from which rock, gravel, caliche, or clay has been removed. They range in size from 5 to 550 acres and in depth from about 10 to 100 feet. The surface material is usually residual rock, gravel, caliche, or clay that has been disturbed in excavation. The material ranges in thickness from a few inches to several feet where it is in piles.

The Orif soils, frequently flooded (Or) are deep, nearly level soils on flood plains of large creeks and rivers. Slopes are convex and on the average are less than 1 percent. They are adjacent to the stream channel. Typically, the surface layer is grayish brown, moderately alkaline gravelly loamy sand and 20 inches thick. The underlying layer to a depth of 60 inches is very gravelly loamy sand stratified with very gravelly sand, very gravelly sandy loam, and loam. These soils are well drained. Flooding occurs several times in most years and is very brief duration. Surface runoff is slow. Permeability is rapid. Water erosion is a severe hazard.

The Lewisville silty clay, 0-1% slopes (LeA) is a deep, nearly level soil on plane to slightly convex slopes on stream terraces. Typically, the surface layer is dark grayish brown, silty clay about 17 inches thick. The subsoil, to a depth of roughly 36 inches, is brown silty clay. To depth of 54 inches, the soil is yellowish brown silty clay. The underlying material to a depth of nearly 61 inches is brown silty clay. The soil is moderately alkaline and calcareous throughout. The soil is well drained, surface runoff is slow, permeability is moderate, the available water capacity is high, and there is a slight hazard due to water erosion.

The Lewisville silty clay, 1-3% slopes (LeB) is a deep, gently sloping soil on stream terraces. Typically, the surface layer is dark grayish brown, silty clay about 15 inches thick. The subsoil, to a depth of roughly 33 inches, is brown silty clay. To depth of 63 inches, the soil is reddish yellow silty clay. The soil is moderately alkaline and calcareous throughout. The soil is well drained, surface runoff is medium, and permeability is moderate. The available water capacity is high and there is a moderate hazard due to water erosion.

Narrative Description of the Site Geology

The project site consists of a 50 foot boundary around the proposed sewer line associated with the The Veramendi Subdivision Development, Outfall Sewer Line in New Braunfels, Texas. An overall view of the area is shown on Plates 1 through 9 in Appendix A. Natural karst features and manmade features were noted on the project site during the on site inspection. Based on a visual inspection of the ground surface the overall potential for fluid flow from the project site into the Edwards Aquifer appears to be low.

Potential Recharge Features # S-67, S-68, S-71, and S-111 consists of sanitary sewer manhole covers along an existing sewer line. Frost GeoSciences, Inc. rates the relative infiltration rate of these features as low on Figure 1 of the TCEQ-0585-Instructions (Rev. 10-01-04). These features score a 37 on the sensitivity scale, column 10 in the Geologic Assessment Table on Page 5 of this report. Frost GeoSciences, Inc. does not consider these to be sensitive features.

Potential Recharge Feature # S-70 consists of an outcrop of vuggy rock within a cliff face. Frost GeoSciences, Inc. rates the relative infiltration rate of this feature as low on Figure 1 of the TCEQ-0585-Instructions (Rev. 10-01-04). This feature scores a 14 on the sensitivity scale, column 10 in the Geologic Assessment Table on Page 5 of this report. Frost GeoSciences, Inc. does not consider this to be a sensitive feature.

Potential Recharge Feature # S-73 consists of a horizontal solution cavity measuring 1 foot by 1.5 feet by 6 feet deep into a cliff face. Frost GeoSciences, Inc. rates the relative

infiltration rate of this feature as low on Figure 1 of the TCEQ-0585-Instructions (Rev. 10-01-04). This feature scores a 29 on the sensitivity scale, column 10 in the Geologic Assessment Table on Page 5 of this report. Frost GeoSciences, Inc. does not consider this to be a sensitive feature.

Potential Recharge Feature # S-74 consists of a zone of solution cavities within a cliff face. Frost GeoSciences, Inc. considers these to be a zone of discharge features into Blieders Creek and rates the relative infiltration rate of these features as low on Figure 1 of the TCEQ-0585-Instructions (Rev. 10-01-04). This feature scores a 39 on the sensitivity scale, column 10 in the Geologic Assessment Table on Page 5 of this report. Frost GeoSciences, Inc. does not consider this to be a sensitive feature.

Potential Recharge Feature # S-112 consists of a fault along the boundary between the recharge zone and the transition zone. This fault has Edwards Person Limestone to the north and Quaternary Terrace Deposits overlying Cretaceous Taylor Marl to the south. Frost GeoSciences, Inc. rates the relative infiltration rate of this feature as low on Figure 1 of the TCEQ-0585-Instructions (Rev. 10-01-04). This feature scores a 29 on the sensitivity scale, column 10 in the Geologic Assessment Table on Page 5 of this report. Frost GeoSciences, Inc. does not consider this to be a sensitive feature.

The overall vegetative cover on the project site consists of Ashe juniper (*Juniperus ashei*), Live Oak (*Quercus virginiana*) and Texas Persimmon (*Diospyros texana*) with Hackberry (*Celtis sp.*), mesquite, prickly pear cactus, and a sparse to moderate stand of native grasses. The variations in the vegetative cover across the project site are visible in the 2018 aerial photographs on Plates 8 and 9 in Appendix A and in the site visit photographs included in Appendix B.

According to the USGS 7.5 Minute Quadrangle Map, New Braunfels West, Texas Sheet (1988), and the New Braunfels East, Texas Sheet (1994) the elevation of the project site ranges from 710 feet in the central portion of the project site near Loop 337 to 630 feet in the southern portion of the site near Lakeview Blvd. These elevations are calculated above mean sea level (AMSL). According to topographic data obtained from Pape Dawson Engineers, the elevation on the project site

ranges from 627 feet in the southern portion of the project site near Lakeview Blvd. to 712 feet in the central portion of the site near Loop 337. A copy of the site plan, indicating the boundary of the project site and the elevations, is included on Plate I in Appendix A and on the Site Geologic Map in Appendix C of this report.

According to the Bureau of Economic Geology, Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle (2000), the project site is covered by the Cretaceous Edwards Person Limestone and Quaternary Fluvial Terrace Deposits (Qt). Based on our site inspection FGS is of the opinion that the project site is located on the Leached and Collapsed Member and the Regional Dense Member of the Edwards Person Limestone north of the fault and Quaternary Fluvial Terrace Deposits south of the fault.

Quaternary Fluvial Terrace Deposits (Qt). The Quaternary Fluvial Terrace Deposits consists of gravel, sand, silt, and clay. The gravel is predominantly limestone, dolostone, and chert. These low terrace deposits are mostly above the flood level along entrenched streams. The fluvial morphology is well preserved with point bars, oxbows, and abandoned channel segments.

The Leached and Collapsed Member of the Edwards Person Limestone (Kep) consists of crystalline limestone, mudstone to grainstone with chert, and collapsed breccia. This member is stromatolitic limestone. The Leached and Collapsed Member is characterized by bioturbated iron stained beds separated by massive limestone beds. This member is typically one of the most permeable and has extensive lateral development with large rooms. Overall thickness ranges from 70 to 90 feet thick.

The Regional Dense Member of the Edwards Person Limestone (Kep) consists of dense argillaceous mudstone with wispy iron oxide stains. This member has minimal cavern development and usually occurs as vertical fracture enlargement. Overall thickness ranges from 20 to 24 feet thick.

A copy of the Bureau of Economic Geology, Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle (2000), indicating the location of the project site, is included on Plate 7 in Appendix A.

BEST MANAGEMENT PRACTICE (BMP)

Based on a visual inspection of the ground surface the overall potential for fluid flow from the project site into the Edwards Aquifer appears to be low. The potential always exists to encounter subsurface features that lack a surface expression. Frost GeoSciences, Inc. recommends that construction personnel be informed of the potential to encounter subsurface karst features during excavating activities. Construction personnel should also be informed of the proper protocol to follow in the event that a solution cavity and/or cave is encountered during the excavation and development of the property.

DISCLAIMER

This report has been prepared in general accordance with the "Instructions to Geologists", TCEQ-0585-Instructions (Rev. 10-1-04) by a Licensed Texas Professional Geoscientist. All areas of the project site were carefully inspected for features that could contribute to the recharge of the Edwards Aquifer, however, this survey cannot preclude the presence of subsurface karst features that lack surface expression. This report is not intended to be a definitive investigation of all possible geologic or karst features at this site. All conclusions, opinions and recommendations for Best Management Practices (BMP's) in this report are based on information obtained while researching the project and on the site conditions at the time of our field investigation.

This report has been prepared for and may be relied upon by THE VERAMENDI SUBDIVISION: PE-ADELAIDE LLC C/O ASA PROPERTIES. This report is based on available known records, a visual inspection of the project site and the work generally accepted for a Geologic Assessment TAC §213.5(b)(3), effective June 1, 1999.

REFERENCES

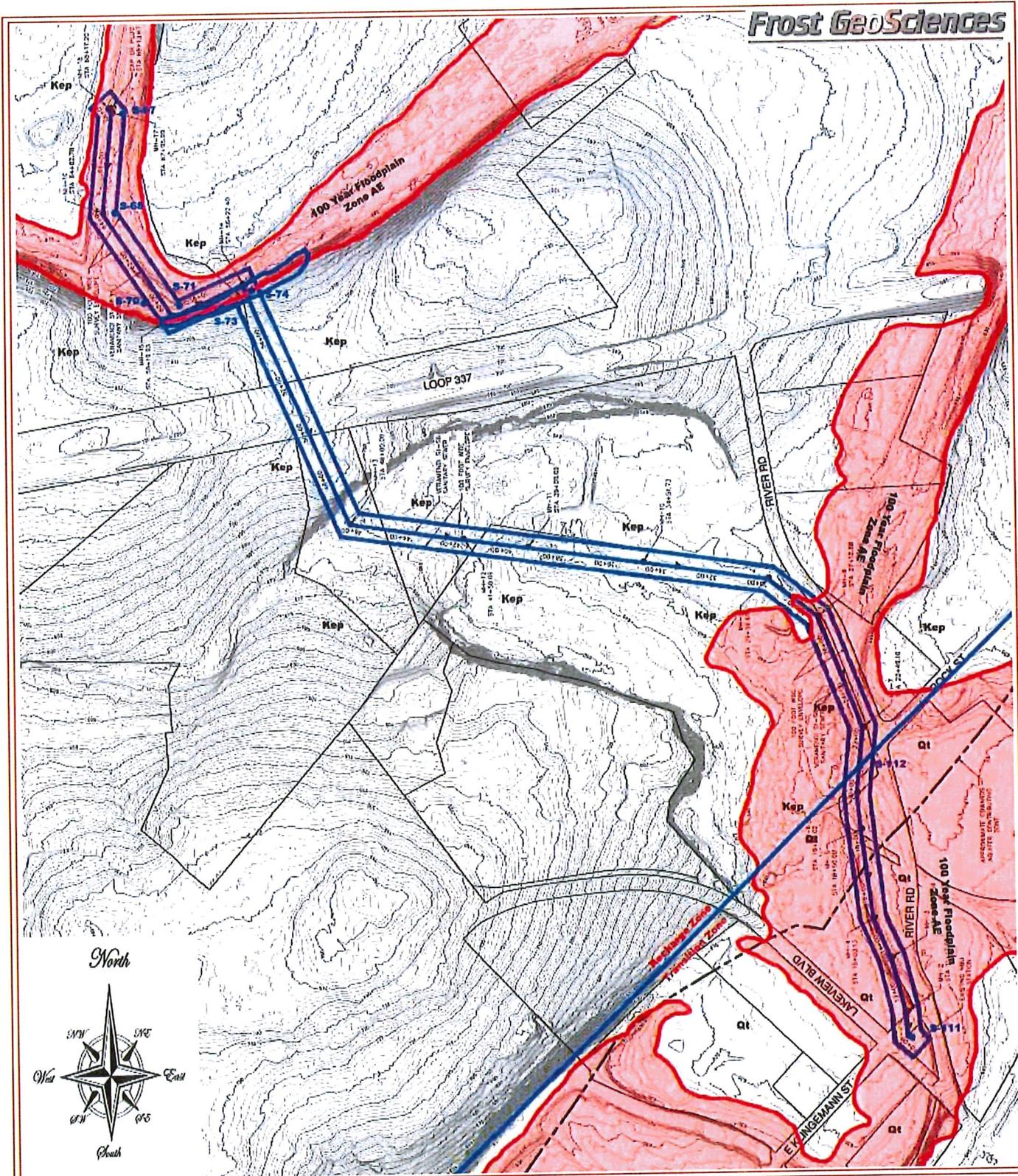
- 1) USGS 7.5 Minute Quadrangle Map, New Braunfels West, Texas Sheet (1988),
- 2) USGS 7.5 Minute Quadrangle Map, New Braunfels East, Texas Sheet (1994),
- 3) Official Edwards Aquifer Recharge Zone Map, New Braunfels West, Texas Sheet (2014).
- 4) Official Edwards Aquifer Recharge Zone Map, New Braunfels East, Texas Sheet (2014).

January 18, 2019
THE VERAMENDI SUBDIVISION
page 13

- 5) Small, T.A., and Hanson, J.A., 1994, Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Recharge Zone, Comal County, Texas. U.S. Geological Survey Water Resources Investigations 94-4117.
- 6) Collins, Edward, W., 2000, Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle.
- 7) Federal Emergency Management Agency (FEMA), Bexar County, Texas and Incorporated Areas, Flood Insurance Rate Map (FIRM), Panel 48091C0435F (9/02/09) FEMA, Washington D.C.
- 8) Federal Emergency Management Agency (FEMA), Bexar County, Texas and Incorporated Areas, Flood Insurance Rate Map (FIRM), Panel 48091C0455F (9/02/09) FEMA, Washington D.C.
- 9) USDA Soil Conservation Service, Soil Survey of Comal & Hays Counties, Texas (1982).
- 10) TCEQ-0585-Instructions (Rev. 10-1-04). "Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zone".

Appendix A

Site Location Plates



PROJECT NAME:
 Geologic Site Assessment (SCS)
 for Regulated Activities / Development on the
 Edwards Aquifer Recharge / Transition Zone
 Veramendi, Outfall Sewer Line
 New Braunfels, Texas

Site Plan

PROJECT NO.: FGS-E18221	DATE: January 18, 2019
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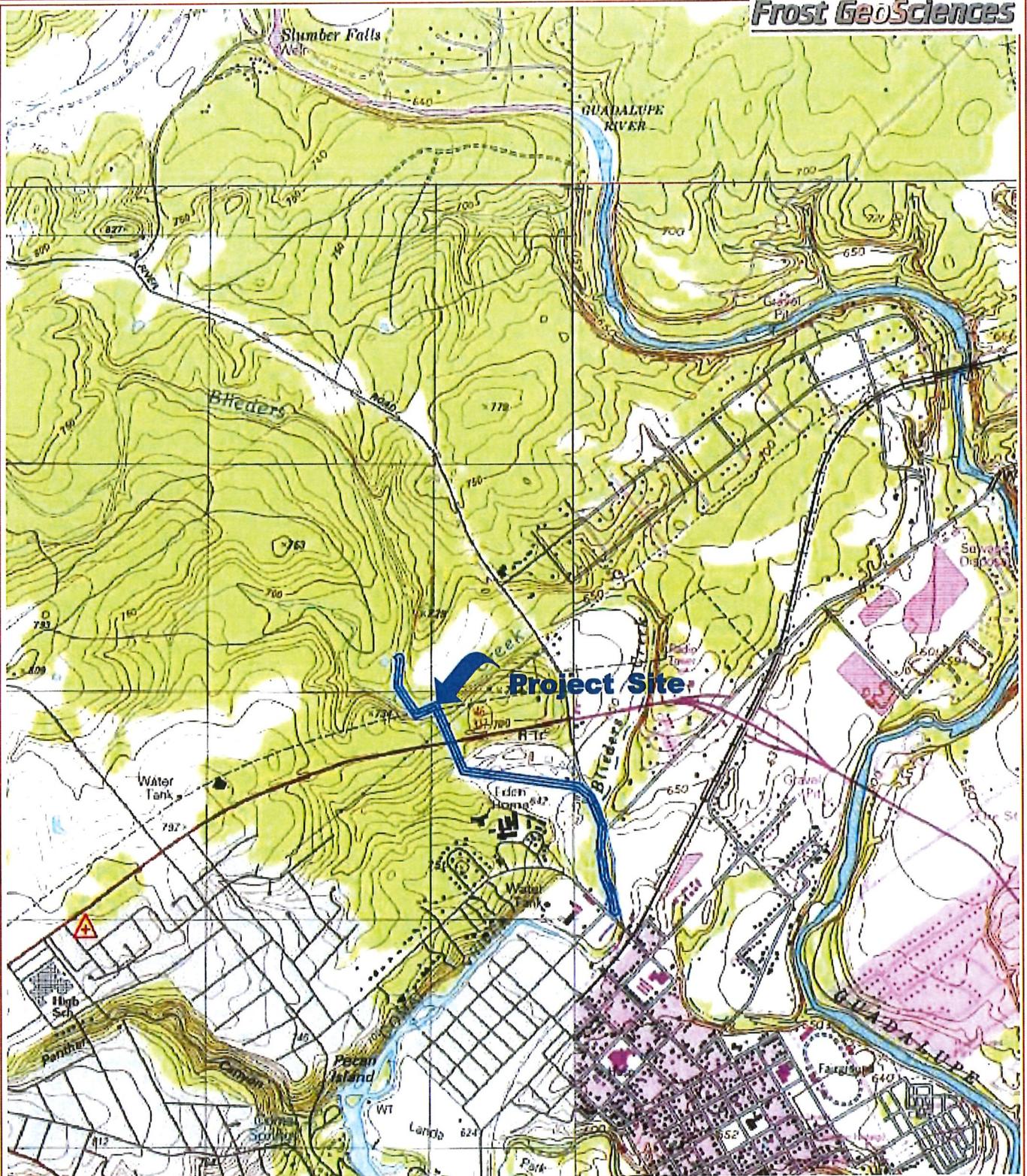


PROJECT NAME:
Geologic Site Assessment (SCS)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
Veramendi, Outfall Sewer Line
New Braunfels, Texas

Street Map

PROJECT NO.:
FGS-E18221

DATE:
January 18, 2019

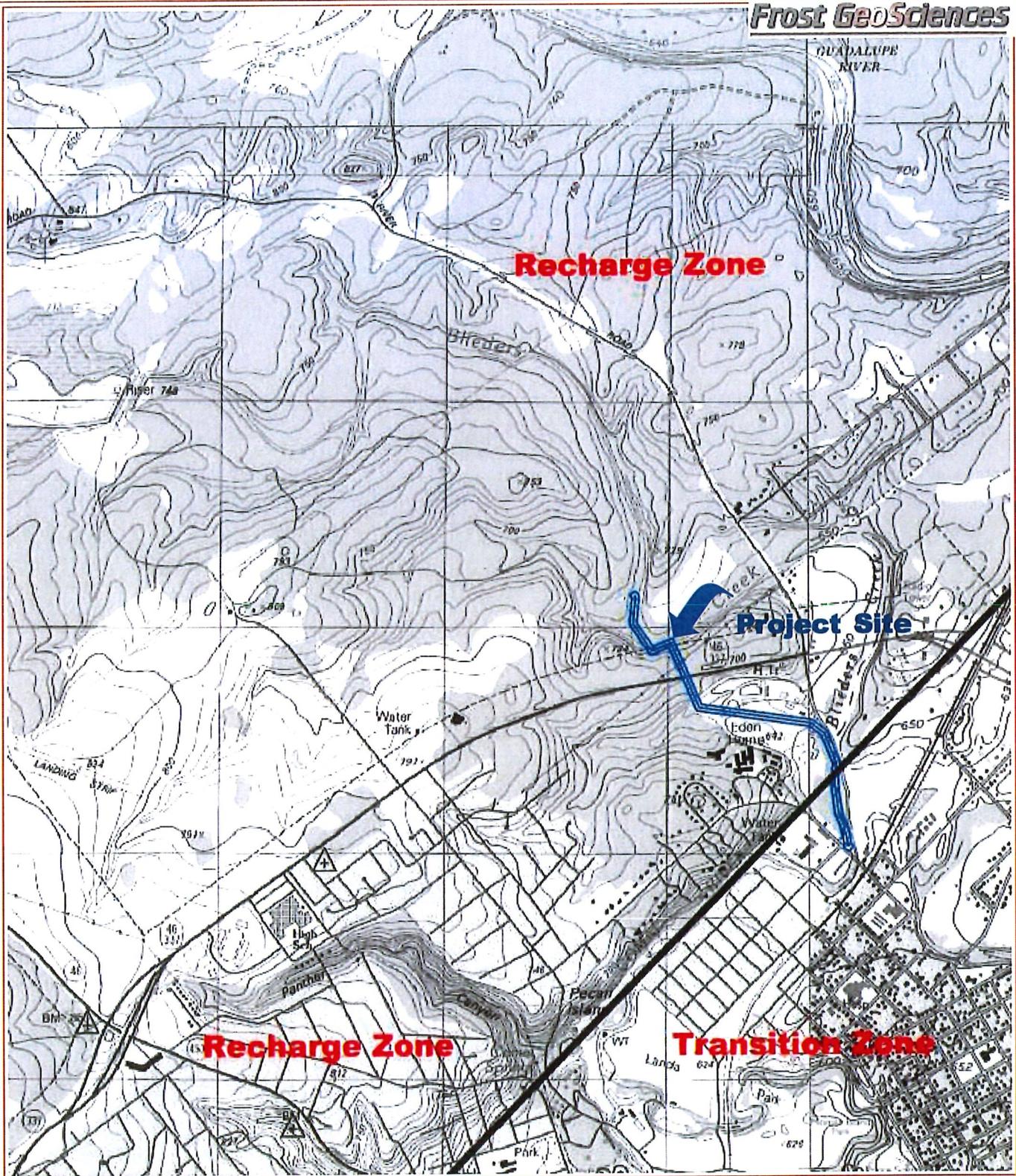


PROJECT NAME:
 Geologic Site Assessment (SCS)
 for Regulated Activities / Development on the
 Edwards Aquifer Recharge / Transition Zone
 Veramendi, Outfall Sewer Line
 New Braunfels, Texas

U.S.G.S. 7.5 Minute Quadrangle Map
 New Braunfels West, Texas Sheet (1988)
 New Braunfels East, Texas Sheet (1994)

PROJECT NO.:
 FGS-E18221

DATE:
 January 18, 2019

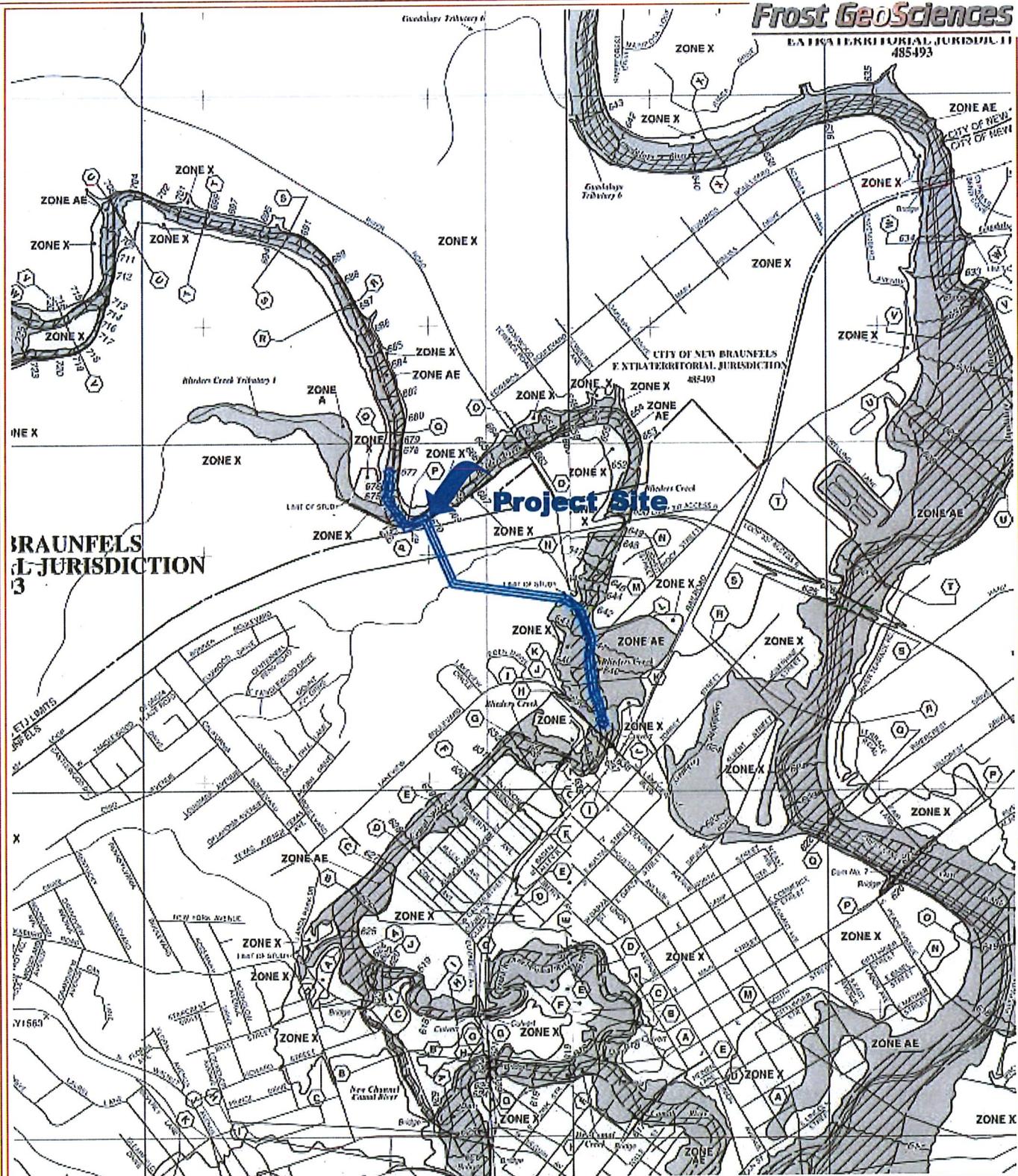


PROJECT NAME:
 Geologic Site Assessment (SCS)
 for Regulated Activities / Development on the
 Edwards Aquifer Recharge / Transition Zone
 Veramendi, Outfall Sewer Line
 New Braunfels, Texas

Official Edwards Aquifer Recharge Zone Map
 New Braunfels West, Texas Sheet (2014)
 New Braunfels East, Texas Sheet (2014)

PROJECT NO.:
 FGS-E18221

DATE:
 January 18, 2019

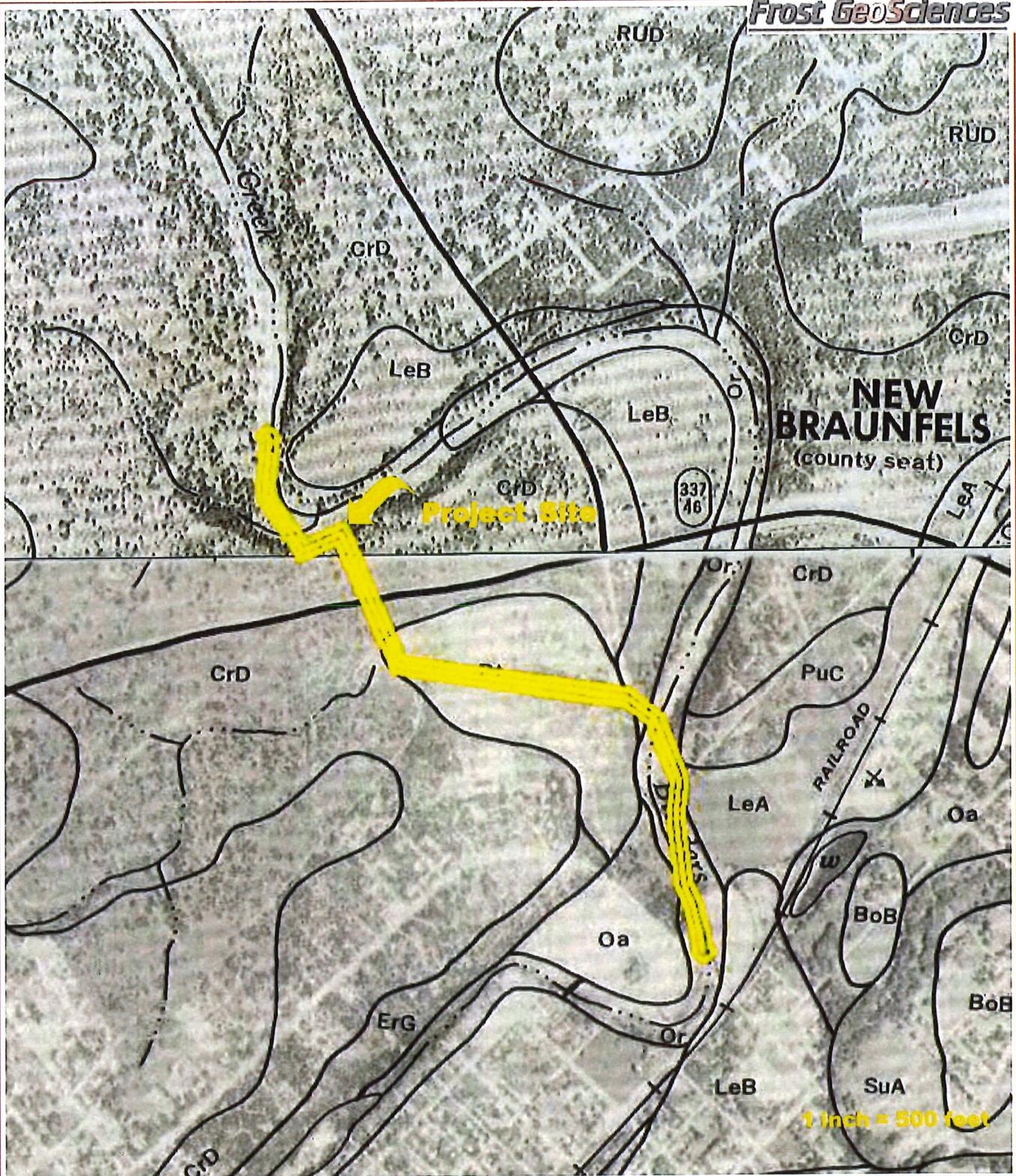


PROJECT NAME:
 Geologic Site Assessment (SCS)
 for Regulated Activities / Development on the
 Edwards Aquifer Recharge / Transition Zone
 Veramendi, Outfall Sewer Line
 New Braunfels, Texas

Flood Insurance Rate Map (FIRM)
 Community Panel #s 48091C0435F
 and 48091C0455F (Revised 9/02/09)

PROJECT NO.:
 FGS-E18221

DATE:
 January 18, 2019

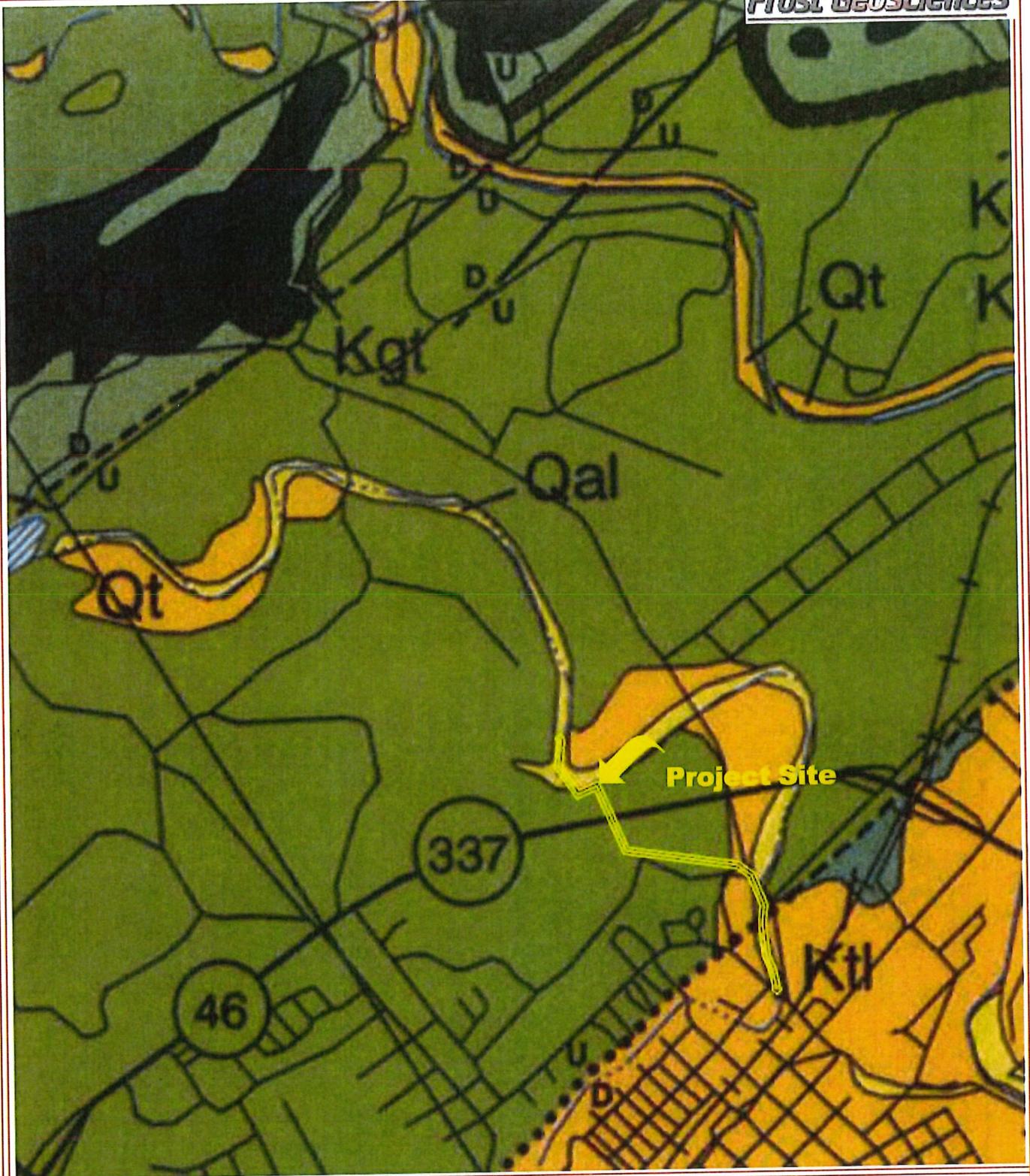


PROJECT NAME:
Geologic Site Assessment (SCS)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
Veramendi, Outfall Sewer Line
New Braunfels, Texas

1973 Aerial Photograph
United States Department of Agriculture

PROJECT NO.:
FGS-E18221

DATE:
January 18, 2019



PROJECT NAME:
Geologic Site Assessment (SCS)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
Veramendi, Outfall Sewer Line
New Braunfels, Texas

Bureau of Economic Geology
Geologic Map of the New Braunfels, Texas
30 X 60 Minute Quadrangle (2000)

PROJECT NO.:
FGS-E18221

DATE:
January 18, 2019



PROJECT NAME:

Geologic Site Assessment (SCS)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
Veramendi, Outfall Sewer Line
New Braunfels, Texas

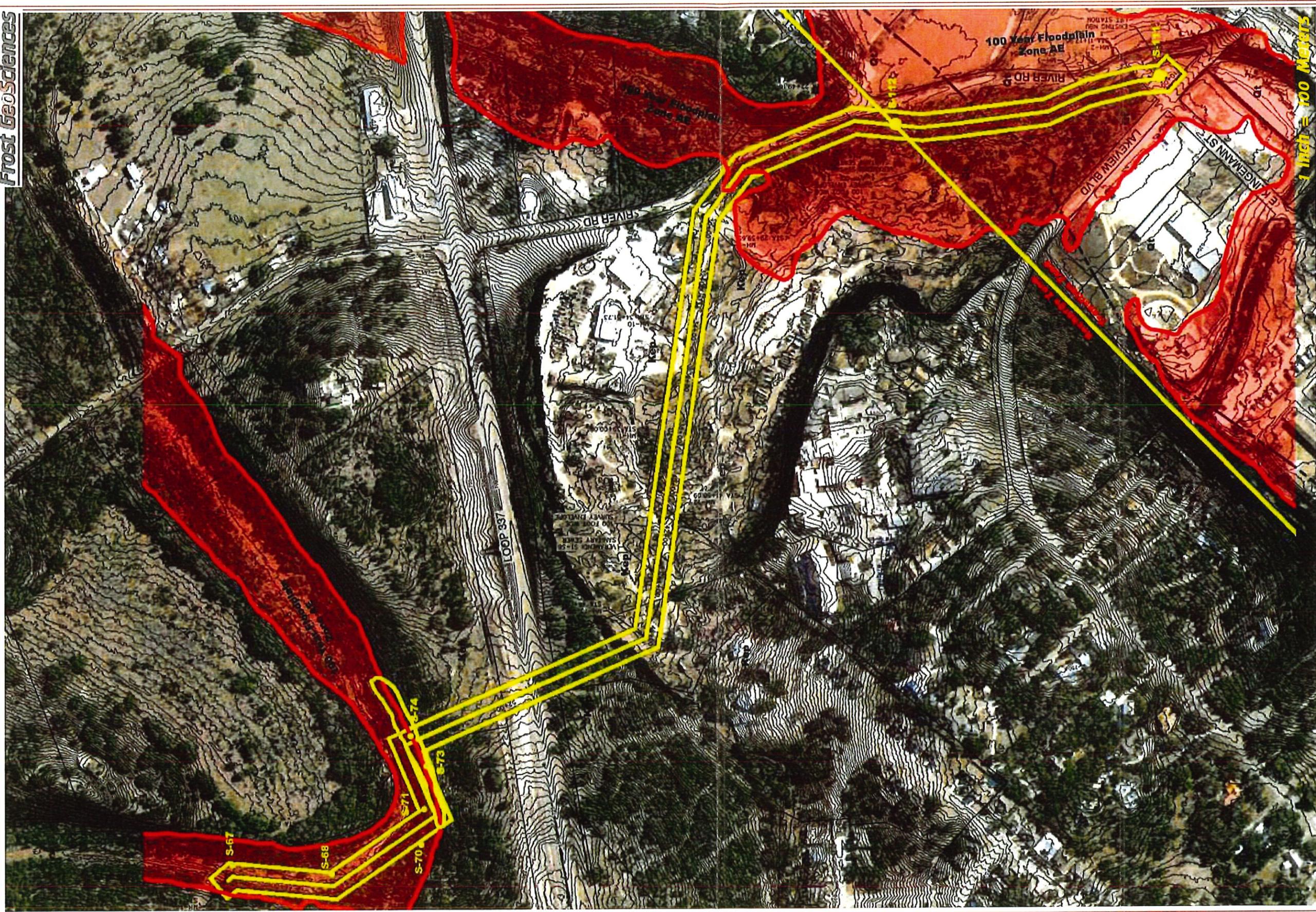
2018 Aerial Photograph
Google Earth

PROJECT NO.:

FGS-E18221

DATE:

January 18, 2019



PROJECT NAME:

Geologic Site Assessment (SCS)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
Veramendi, Outfall Sewer Line
New Braunfels, Texas

2018 Aerial Photograph
with Potential Recharge Features
(Google Earth)

PROJECT NO.: FGS-E18221

DATE: January 18, 2019

Appendix B

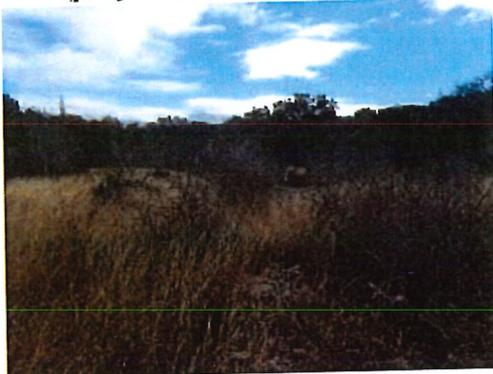
Site Inspection Photographs



View of S-67 at the northern limits of the project site near Area 1



View to the south, of the project site near Area 1.



View to the south, of the project site near Area 2.



View to the north, of the project site near Area 1.



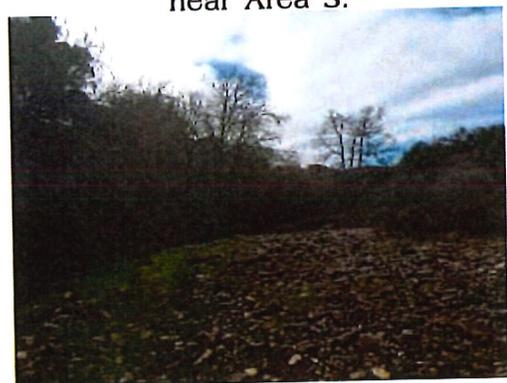
View to the north, of the project site near Area 3.



View of S-71, noted near Area 3.



View to the east, of the project site near Area 3.



View to the west, of the project site near Area 4.



Typical view of the cliff face near Area 4.



Typical view of the cliff face near Area 4.



View to the north, at the top of the cliff near Area 4.



View to the south, at the top of the cliff near Area 4.



View to the north, of the project site near Area 5.



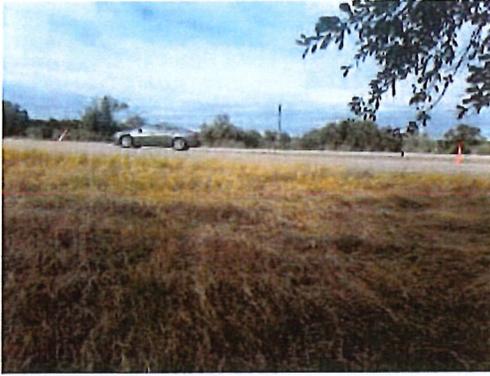
View to the south, of the project site near Area 5.



View to the south, of the project site near Area 6.



View to the north, of the project site near Area 6.



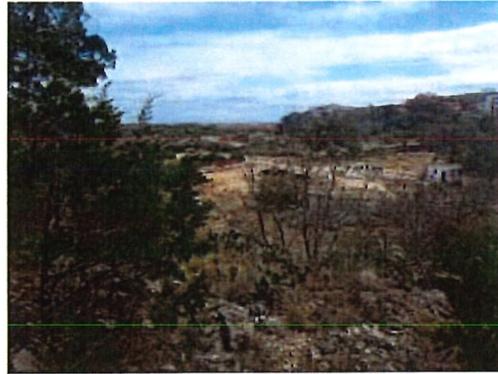
View to the north, of the project site near Area 7.



View to the south, of the project site near Area 7.



View to the north, at the top of the cliff near Area 8.



View to the south, at the top of the cliff near Area 8.



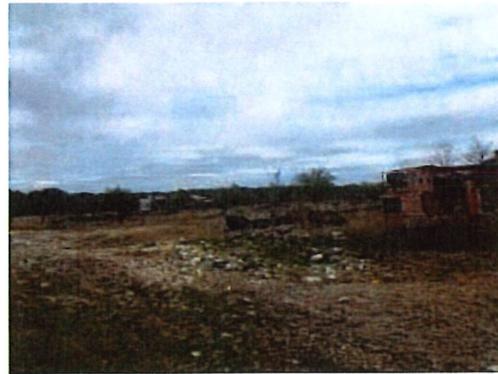
View to the north, at the bottom of the cliff near Area 8.



View to the east, of the project site near Area 8.



View to the west, of the project site near Area 9.



View to the west, of the project site near Area 9.



View to the west, of the project site near Area 10.



View to the east, of the project site near Area 10.



View to the west, of the project site near Area 11.



View to the south, of the project site near Area 11.



View to the north, of the project site near Area 12.



View to the south, of the project site near Area 12.



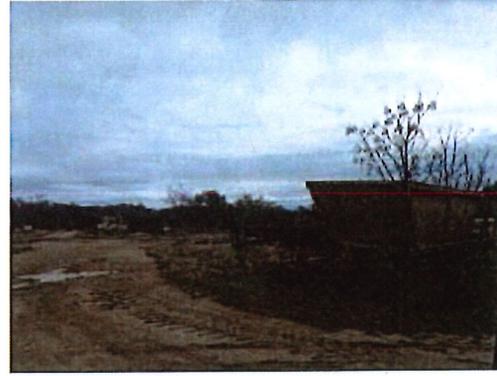
View to the north, of the project site near Area 13.



View to the south, of the project site near Area 13.



View to the west, of the project site near Area 10.



View to the east, of the project site near Area 10.



View to the west, of the project site near Area 11.



View to the south, of the project site near Area 11.



View to the north, of the project site near Area 12.



View to the south, of the project site near Area 12.



View to the north, of the project site near Area 13.



View to the south, of the project site near Area 13.



View to the north, of the project site
near Area 14.



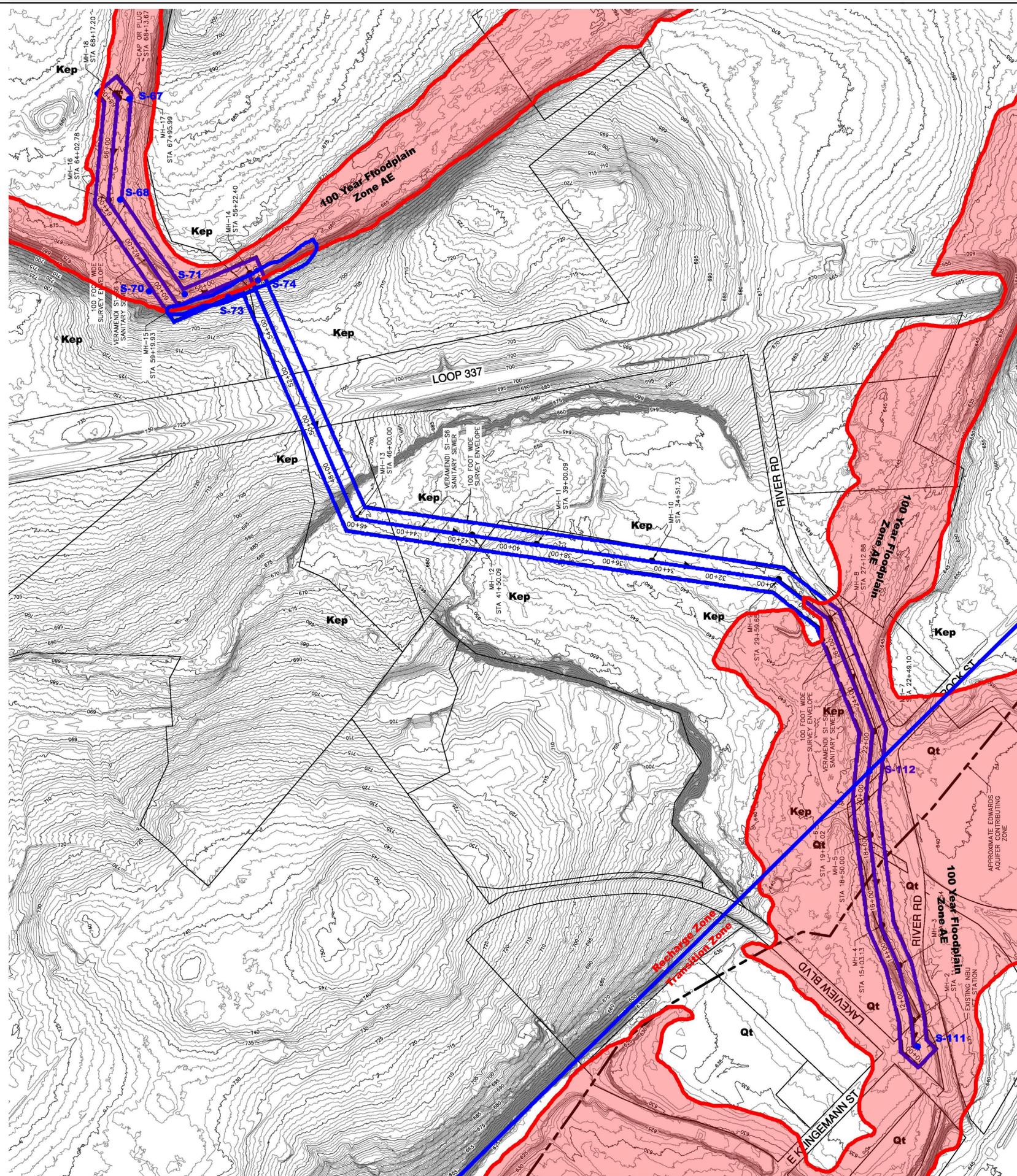
View of PRF # S-111
near Area 14.

Appendix C

Site Geologic Map



Location Map



Site Geologic Map

Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
for the
Veramendi Subdivision
Outfall Sewer Line
New Braunfels, Texas

Frost GeoSciences, Inc. Control # FGS-E18221

Legend

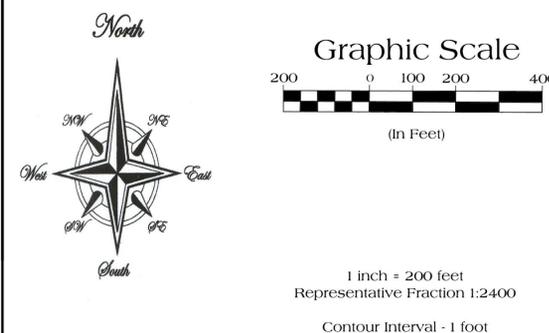
- Fill - Fill Material
 - Qal - Alluvium
 - Kau - Austin Chalk
 - Kef - Eagle Ford Shale
 - Kbu - Buda Limestone
 - Kdr - Del Rio Clay
 - Kgt - Georgetown Limestone
 - Kep - Edwards Person Limestone
 - Kek - Edwards Kainer Limestone
 - Kgr - Glen Rose Formation
-
- S# - Potential Recharge Feature (PRF)
 - - - - - Formation Contact
 - · - · - 100-Year Floodplain - Zone A
 - - - - - 100-Year Floodplain - Zone AE
 - · - · - Other Flood Hazard Area - Zone X (shaded)

Floodplain Information Obtained From
FIRM: Flood Insurance Rate Map
Comal County, Texas: Panel # 48091C0435, Revised 9/02/09
Comal County, Texas: Panel # 48091C0455, Revised 9/02/09

Fault Information Obtained From:
Bureau of Economic Geology, Geologic Atlas of Texas, San Antonio Sheet (1983)
U.S. Geological Survey, Water Resources Investigations Report 94-417 (1994)
Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle (2000)



Signature of Texas Licensed Geoscientist
Steve Frost, TPG# 315, AIPG # 10176



**RECHARGE AND TRANSITION
ZONE EXCEPTION REQUEST
FORM (TCEQ-0628)**

Recharge and Transition Zone Exception Request Form

Texas Commission on Environmental Quality

30 TAC §213.9 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 **Recharge and Transition Zone Exception Request Form** is hereby submitted for TCEQ review and executive director approval. The request was prepared by:

Print Name of Customer/Agent: Dennis R. Rion, P.E.

Date: 9/22/2020

Signature of Customer/Agent:



Regulated Entity Name: Veramendi Sanitary Sewer S1-S6

Exception Request

- Attachment A - Nature of Exception.** A narrative description of the nature of each exception requested is attached. All provisions of 30 TAC §213 Subchapter A for which an exception is being requested have been identified in the description.
- Attachment B - Documentation of Equivalent Water Quality Protection.** Documentation demonstrating equivalent water quality protection for the Edwards Aquifer is attached.

Administrative Information

- 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.
- The applicant understands that no exception will be granted for a prohibited activity in Chapter 213.
- The applicant understands that prior approval under this section must be obtained from the executive director for the exception to be authorized.

ATTACHMENT A

VERAMENDI SANITARY SEWER S1-S6 Recharge Zone Exception Request Form (TCEQ-0628)

Attachment A – Nature of Exception

The Veramendi Sanitary Sewer S1-S6 Sewage Collection System (SCS) Application was approved by the Texas Commission on Environmental Quality on October 17, 2019 (ID No. 13000985) for the construction of a total of approximately 6384.73 linear feet (LF) of gravity sewer main to primarily serve a mixed-use development. The alignment will consist of approximately 5,157.3 LF of 24-inch (24") PVC, SDR 26; 29.0 LF of 21-inch (21") PVC, SDR 26; and 1,198.43 LF of 12-inch (12") PVC, SDR 26 gravity sewer main. The 12" sanitary sewer will tie into two existing New Braunfels Utilities (NBU) manholes located on-site. Regulated activities approved include excavation, construction of sewer mains, backfill and compaction. Approximately 14.66 acres of the 1,567-acre drainage area may be disturbed as identified by the limits of the fifty-foot (50') SCS/GA envelope shown on the plans. A 975 LF section of sewer main is approved to be micro-tunneled and contained within a 42" steel casing under the existing TX-337.

This exception is being submitted due to a design change with the micro-tunneled section of approved sewer main being proposed at a deeper bury depth. No additional changes are proposed to the previously-approved plan. Refer to Sheets C2.02-C2.05 included in the exhibits section for additional details.

ATTACHMENT B

VERAMENDI SANITARY SEWER S1-S6

Recharge Zone Exception Request Form (TCEQ-0628)

Attachment B – Equivalent Water Quality Protection

The Veramendi Sanitary Sewer S1-S6 Sewage Collection System (SCS) Application was approved by the Texas Commission on Environmental Quality on October 17, 2019 (ID No. 13000985) for the construction of a total of approximately 6384.73 linear feet (LF) of gravity sewer main to primarily serve a mixed-use development. The alignment will consist of approximately 5,157.3 LF of 24-inch (24") PVC, SDR 26; 29.0 LF of 21-inch (21") PVC, SDR 26; and 1,198.43 LF of 12-inch (12") PVC, SDR 26 gravity sewer main. The 12" sanitary sewer will tie into two existing New Braunfels Utilities (NBU) manholes located on-site. Regulated activities approved include excavation, construction of sewer mains, backfill and compaction. Approximately 14.66 acres of the 1,567-acre drainage area may be disturbed as identified by the limits of the fifty-foot (50') SCS/GA envelope shown on the plans. A 975 LF section of sewer main is approved to be microtunneled and contained within a 42" steel casing under the existing TX-337. This exception is being submitted due to a design change with this section of approved sewer main being proposed at a deeper bury depth. No additional changes are proposed to the previously-approved plan. Refer to Sheets C2.02-C2.05 included in the exhibits section for additional details.

Due to the nature of this exception being a SCS, equivalent water protection has been achieved through no proposed impervious cover and proper design of the sewer main.

**ORGANIZED SEWAGE
COLLECTION SYSTEM PLAN
(TCEQ-0582)**

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: Veramendi Sanitary Sewer S1 - S6

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

Customer Information

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

Contact Person: Jason Theurer

Entity: New Braunfels Utilities

Mailing Address: 335 FM 306

City, State: New Braunfels, TX

Zip: 78130

Telephone: (830) 608-8830

Fax: _____

Email Address: jtheurer@nbutexas.com

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

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

Contact Person: Dennis R. Rion, P.E.

Texas Licensed Professional Engineer's Number: 67109

Entity: Pape-Dawson Engineers, Inc.

Mailing Address: 2000 NW Loop 410

City, State: San Antonio, TX

Zip: 78213

Telephone: (210) 375-9000

Fax: (210) 375-9010

Email Address: drion@pape-dawson.com

Project Information

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

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

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

100% Domestic 1.15 MGD gallons/day
 _____% Industrial _____ gallons/day
 _____% Commingled _____ gallons/day
 Total gallons/day: 210 gpd/LUE x 5,495 LUE=1.15 MGD (average)

6. Existing and anticipated infiltration/inflow is 750 gallons/day. This will be addressed by: adequate sizing of the sewer main.

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

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

8. Pipe description:

Table 1 - Pipe Description

<i>Pipe Diameter(Inches)</i>	<i>Linear Feet (1)</i>	<i>Pipe Material (2)</i>	<i>Specifications (3)</i>
24" Gravity	5,157.3	PS115 PVC SDR26	ASTM F679, ASTM D3212
21" Gravity	29	PS115 PVC SDR26	ASTM F679, ASTM D3212
12" Gravity	1,198.43	PVC SDR26	ASTM 3034, ASTM D3212

Total Linear Feet: 6,384.73

- (1) Linear feet - Include stub-outs and double service connections. Do not include private service laterals.
 - (2) Pipe Material - If PVC, state SDR value.
 - (3) Specifications - ASTM / ANSI / AWWA specification and class numbers should be included.
9. The sewage collection system will convey the wastewater to the Old Gruene Wastewater (name) Treatment Plant. The treatment facility is:

- Existing
- Proposed

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

- The City of New Braunfels standard specifications.
- Other. Specifications are attached.

11. No force main(s) and/or lift station(s) are associated with this sewage collection system.
- A force main(s) and/or lift station(s) is associated with this sewage collection system and the **Lift Station/Force Main System Application** form (TCEQ-0624) is included with this application.

Alignment

12. There are no deviations from uniform grade in this sewage collection system without manholes and with open cut construction.
13. There are no deviations from straight alignment in this sewage collection system without manholes.
- Attachment B - Justification and Calculations for Deviation in Straight Alignment without Manholes.** A justification for deviations from straight alignment in this sewage collection system without manholes with documentation from pipe manufacturer allowing pipe curvature is attached.
- For curved sewer lines, all curved sewer line notes (TCEQ-0596) are included on the construction plans for the wastewater collection system.

Manholes and Cleanouts

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

Table 2 - Manholes and Cleanouts

<i>Line</i>	<i>Shown on Sheet</i>	<i>Station</i>	<i>Manhole or Clean-out?</i>
24"	C2.05 Of	68+32.29	MH-19
12"	C2.06 Of	12+98.43	EX-MH-2
	Of		

<i>Line</i>	<i>Shown on Sheet</i>	<i>Station</i>	<i>Manhole or Clean-out?</i>
	Of		

15. Manholes are installed at all Points of Curvature and Points of Termination of a sewer line.
16. The maximum spacing between manholes on this project for each pipe diameter is no greater than:

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

17. All manholes will be monolithic, cast-in-place concrete.
- The use of pre-cast manholes is requested for this project. The manufacturer's specifications and construction drawings, showing the method of sealing the joints, are attached.

Site Plan Requirements

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

18. The Site Plan must have a minimum scale of 1" = 400'.
Site Plan Scale: 1" = 100'.
19. The Site Plan must include the sewage collection system general layout, including manholes with station numbers, and sewer pipe stub outs (if any). Site plan must be overlain by topographic contour lines, using a contour interval of not greater than ten

feet and showing the area within both the five-year floodplain and the 100-year floodplain of any drainage way.

20. Lateral stub-outs:

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

21. Location of existing and proposed water lines:

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

22. 100-year floodplain:

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

Table 3 - 100-Year Floodplain

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
24"	C2.00 of	16+75.00 to 27+20.04
24"	C2.04 of	56+00.00 to 68+32.29
21"	C2.05 of	68+32.29 to 68+61.29
	of	to

23. 5-year floodplain:

- After construction is complete, no part of this project will be in or cross a 5-year floodplain, either naturally occurring or man-made. (Do not include streets or concrete-lined channels constructed above sewer lines.)
- After construction is complete, all sections located within the 5-year floodplain will be encased in concrete or capped with concrete. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)

Table 4 - 5-Year Floodplain

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
24"	C2.00 of	16+75.00 to 26+55.00
24"	C2.04 of	56+12.00 to 60+10.00

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
24"	C2.05 of	63+10.00 to 68+32.29
21"	C2.05 of	68+32.29 to 68+61.29

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

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

26. All existing or proposed water line crossings and any parallel water lines within 9 feet of sewer lines are listed in the table below. These lines must have the type of pressure rated pipe to be installed shown on the plan and profile sheets. Any request for a variance from the required pressure rated piping at crossings must include a variance approval from 30 TAC Chapter 290.
- There will be no water line crossings.
- There will be no water lines within 9 feet of proposed sewer lines.

Table 5 - Water Line Crossings

<i>Line</i>	<i>Station or Closest Point</i>	<i>Crossing or Parallel</i>	<i>Horizontal Separation Distance</i>	<i>Vertical Separation Distance</i>

27. Vented Manholes:

- No part** of this sewer line is within the 100-year floodplain and vented manholes are not required by 30 TAC Chapter 217.
- A portion** of this sewer line is within the 100-year floodplain and vented manholes will be provided at less than 1500 foot intervals. These water-tight manholes are listed in the table below and labeled on the appropriate profile sheets.
- A portion** of this sewer line is within the 100-year floodplain and an alternative means of venting shall be provided at less than 1500 feet intervals. A description of the alternative means is described on the following page.

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

Table 6 - Vented Manholes

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>
24"	MH-7	22+51.81	C2.01
24"	MH-14	56+26.92	C2.04
24"	MH-17	64+19.44	C2.05

28. Drop manholes:

- There are no drop manholes associated with this project.
- Sewer lines which enter new or existing manholes or "manhole structures" higher than 24 inches above the manhole invert are listed in the table below and labeled on the appropriate profile sheets. These lines meet the requirements of 30 TAC §217.55(l)(2)(H).

Table 7 - Drop Manholes

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>

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

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

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

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

31. Minimum flow velocity (From Appendix A)

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

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

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

Table 8 - Flows Greater Than 10 Feet per Second

<i>Line</i>	<i>Profile Sheet</i>	<i>Station to Station</i>	<i>FPS</i>	<i>% Slope</i>	<i>Erosion/Shock Protection</i>

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

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

Administrative Information

- 34. The final plans and technical specifications are submitted for TCEQ review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.
- 35. Standard details are shown on the detail sheets, which are dated, signed, and sealed by the Texas Licensed Professional Engineer, as listed in the table below:

Table 9 - Standard Details

<i>Standard Details</i>	<i>Shown on Sheet</i>
Lateral stub-out marking [Required]	N/A per NBU of .
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) [Required]	C4.00 of
Alternate method of joining lateral to existing SCS line for potential future connections [Required]	N/A per NBU of .
Typical trench cross-sections [Required]	C4.00 of
Bolted manholes [Required]	C4.00 of
Sewer Service lateral standard details [Required]	N/A of
Clean-out at end of line [Required, if used]	N/A of

Standard Details	Shown on Sheet
Baffles or concrete encasement for shock/erosion protection [Required, if flow velocity of any section of pipe >10 fps]	N/A of
Detail showing Wastewater Line/Water Line Crossing [Required, if crossings are proposed]	N/A of
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) [Required, if Flexible Pipe is used]	C4.00 of
Drop manholes [Required, if a pipe entering a manhole is more than 24 inches above manhole invert]	N/A of

36. All organized sewage collection system general construction notes (TCEQ-0596) are included on the construction plans for this sewage collection system.
37. All proposed sewer lines will be sufficiently surveyed/staked to allow an assessment prior to TCEQ executive director approval. If the alignments of the proposed sewer lines are not walkable on that date, the application will be deemed incomplete and returned.
- Survey staking was completed on this date: when advised by TCEQ of site inspection
38. Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
39. Any modification of this SCS application will require TCEQ approval, prior to construction, and may require submission of a revised application, with appropriate fees.

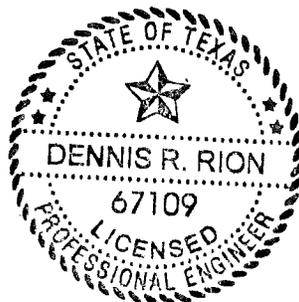
Signature

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

Print Name of Licensed Professional Engineer: Dennis R. Rion, P.E.

Date: 10/6/2020

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)*

R_h = hydraulic radius (ft)

S = slope (ft/ft)

ATTACHMENT A

VERAMENDI SANITARY SEWER S1-S6
Engineering Design Report
12” PVC SDR 26, 21” & 24” PVC PS115

TABLE OF CONTENTS

PROJECT INFORMATION 1

GRAVITY SANITARY SEWER PIPING: FLOW & CAPACITY ANALYSIS..... 2

 Odor Control 2

 Flow Calculation 2

 Capacity Calculation 3

 Conclusion 6

GENERAL STRUCTURAL COMPONENTS 6

 Project Materials (Pipe and Joints): 6

 Project Materials (Bedding): 7

 Project Materials (Manholes):..... 7

 Project Materials (Manhole Covers): 8

 Minimum and Maximum Slopes 8

 Backfill 8

 Trenching..... 8

 Minimum and Maximum Trench Width..... 9

 Trenchless 9

 Corrosion Prevention 9

 Manholes (General)..... 9

 Manholes (Inverts) 10

 Manholes (Ventilation) 10

FLEXIBLE PIPE COMPUTATIONS 10

 Live Load Calculations 11

 Buckling Pressure Calculations..... 11

 Allowable Buckling Pressure: 11

 Pressure Under Installed Conditions..... 13

 Wall Crushing Calculations 14

 Installation Temperature Effects..... 14

 Tensile Strength 15

 Strain 15

 Modulus of Soil Reaction 15

 Zeta Calculation..... 16

 Pipe Stiffness 17

 Deflection 17

VERAMENDI SANITARY SEWER S1-S6

Engineering Design Report

12" PVC SDR 26, 21" & 24" PVC PS115

This Engineering Design Report has been prepared to comply with the Texas Commission on Environmental Quality's Design Criteria for Domestic Wastewater Systems (30 TAC 217), and regulations over the Edwards Aquifer Recharge Zone (30 TAC 213). Please note, throughout this application, the more stringent of New Braunfels Utilities (NBU) or TCEQ regulations shall apply.

PROJECT INFORMATION

Veramendi Sanitary Sewer S1-S6 is part of an overall development to be constructed on an approximate 1,567-acre drainage area which is located approximately 0.3 miles northwest and southwest of the River Rd. and Tx-337 Loop intersection. The site is located within the Extra-Territorial Jurisdiction of the City of New Braunfels in Comal County, Texas, and entirely over the Edwards Aquifer Recharge Zone. A Water Pollution Abatement Plan (WPAP) application will be submitted at a later time for development of portions of these areas but only sewer line installation is proposed at this time and regulated activities will be contained within the sewer envelope. A portion of the sewer main will extend into the Edwards Aquifer Contributing Zone prior to the 24" Line at station 16+75.00 located at manhole MH-5 and is not part of this application.

The Veramendi Sanitary Sewer S1-S6 Sewage Collection System (SCS) Application proposes the construction of a total of approximately 6,384.73 linear feet (LF) of gravity sewer main to primarily serve a mixed-use development. The proposed alignment will consist of approximately 5,157.3 LF of 24-inch (24") PVC, SDR 26; 29.0 LF of 21-inch (21") PVC, SDR 26; and 1,198.43 LF of 12-inch (12") PVC, SDR 26 gravity sewer main. The proposed 12" sanitary sewer will tie into two existing New Braunfels Utilities (NBU) manholes located on-site. Regulated activities proposed include excavation, construction of sewer mains, backfill and compaction. Approximately 14.66 acres of the 1,567-acre drainage area may be disturbed as identified by the limits of the fifty-foot (50') SCS/GA envelope shown on the plans. A 975 LF section of sewer main is proposed to be microtunneled and contained within a 42" steel casing under the existing TX-337.

Based on an assumption of 5,495 LUE's, approximately 1.15 million gallons per day (MGD) (average flow) of domestic wastewater will flow through this SCS. The sewage flow will be disposed of by

VERAMENDI SANITARY SEWER S1-S6

Engineering Design Report

12" PVC SDR 26, 21" & 24" PVC PS115

conveyance to the existing Old Gruene Water Wastewater Treatment Center operated by the New Braunfels Utilities (NBU). No naturally-occurring sensitive features were identified in the Geologic Assessment.

Please refer to Sheets C2.00-C2.06 of the attached sewer plans, which show the proposed service area and its topographic features. For information regarding the capability of the existing system and facilities to handle this increased flow. This system is designed to have a minimum structural life of 50 years.

Safety considerations are the responsibility of the contractor. Safety protection shall be accomplished in accordance with the most recent requirements of the Occupational Safety and Health Administration (OSHA) Standards and Interpretations.

GRAVITY SANITARY SEWER PIPING: FLOW & CAPACITY ANALYSIS

Basis for average flow used for design of collection system (**check one or more**):

Per Capita Contributions:	<input checked="" type="checkbox"/>
Service Connections:	<input checked="" type="checkbox"/>
Land Area and Use:	<input type="checkbox"/>
Fixture Analysis:	<input type="checkbox"/>

Odor Control

Odor Control is not necessary on this project as it is a gravity line and there will be no conditions where sewage is standing and will become septic.

Flow Calculation

Peaking Factor used for design: $\frac{[18+(0.0206 \times F)^{0.5}]}{[4+(0.0206 \times F)^{0.5}]} \times F$

F= 210 GPD approx. factor of 3.3

Peaking Factor is based on: ***NBU Specifications for peak dry weather flow (from NBU 2.9.3)***

VERAMENDI SANITARY SEWER S1-S6

Engineering Design Report

12" PVC SDR 26, 21" & 24" PVC PS115

Calculations for this section of sewer main:

Total LUEs = 5,495

1 LUE = 60 GPD * 3.5/LUE = 210 gallons per day (average sewage flow)

= 693 gallons per day (peak flow)

Infiltration = 750 gallons per acre served

Avg. Flow = 5,495 LUEs x (210 gpd/LUE) + [(750 gpd/acre) x 1,567 acres] = 2,329,200 gpd = 1,618 gpm

Peak Flow = 5,495 LUEs x (693 gpd/LUE) + [(750 gpd/acre) x 1,567 acres] = 4,983,285 gpd = 3,461 gpm

Please note that capacities are determined using Manning's equation for pipes flowing full with an "n" value of 0.013. A reference for Manning's Equation can be found in "The Uni-Bell Handbook of PVC Pipe: Design and Construction".

Capacity Calculation

Characteristics of 12" ASTM D3034, SDR 26, PVC Sewer Pipe:

Nominal Size = 12"

Outer Diameter (D_o) = 12.5"

Minimum Wall Thickness (t) = 0.481"

Inner Diameter (D_i) = 11.538"

Characteristics of 21" ASTM F679, PS115, PVC Sewer Pipe:

Nominal Size = 21"

Outer Diameter (D_o) = 22.047"

Minimum Wall Thickness (t) = 0.791"

Inner Diameter (D_i) = 20.349"

VERAMENDI SANITARY SEWER S1-S6

Engineering Design Report

12" PVC SDR 26, 21" & 24" PVC PS115

Characteristics of 24" ASTM F679, PS115, PVC Sewer Pipe:

Nominal Size = 24"

Outer Diameter (D_o) = 28.803"

Minimum Wall Thickness (t) = 0.889"

Inner Diameter (D_i) = 22.891"

Manning's Equation:

$$Q = (k/n)(A)(R^{2/3})(S^{1/2})$$

$$v = Q/A$$

Where:

Q = Discharge (cfs)

k = Constant [(1.49 ft^{1/3})/sec.]

n = Manning's roughness coefficient (unitless)

A = Flow area (ft²)

R = Hydraulic Radius (ft)

= A/P = Cross sectional area of flow (ft²)/Wetted perimeter (ft.)

S = Slope (ft/ft)

v = Velocity of flow (ft/s)

$n = 0.013$ [as required by 30 TAC 213.53 A(i)]

Calculations for 12" ASTM D3034, SDR 26, PVC Sewer Pipe:

$$A = \pi(D_i^2)/4 = \pi(11.538 \text{ in})^2/4 = 104.56 \text{ in}^2 = 0.73 \text{ ft}^2$$

$$P = \pi(D_i) = \pi(11.538 \text{ in}) = 36.25 \text{ in} = 3.02 \text{ ft}$$

$$R = A/P = 0.73 \text{ ft}^2/3.02 \text{ ft} = 0.24 \text{ ft}$$

$$S = 0.002$$

$$Q = [(1.49 \text{ ft}^{1/3}/\text{sec})/0.013](0.73 \text{ ft}^2)(0.24 \text{ ft})^{2/3}(0.002)^{1/2}$$

$$Q = 1.45 \text{ cfs} = 651 \text{ gpm} = Q_{full}$$

$$v = 1.45 \text{ cfs}/0.73 \text{ ft}^2 = 1.99 \text{ ft/s}$$

$$Q_{max} = 1.45 \text{ cfs} (0.90)(7.48 \text{ gallons}/1 \text{ cf})(60 \text{ sec}/1 \text{ min.}) = 586 \text{ gpm}$$

VERAMENDI SANITARY SEWER S1-S6
Engineering Design Report
12" PVC SDR 26, 21" & 24" PVC PS115

Calculations for 21" ASTM F679, PS115, PVC Sewer Pipe:

$$A = \pi(D_i^2)/4 = \pi(20.349 \text{ in})^2/4 = 325.22 \text{ in}^2 = 2.26 \text{ ft}^2$$

$$P = \pi(D_i) = \pi(20.349 \text{ in}) = 63.93 \text{ in} = 5.33 \text{ ft}$$

$$R = A/P = 2.26 \text{ ft}^2/5.33 \text{ ft} = 0.42 \text{ ft}$$

$$S = 0.001$$

$$Q = [(1.49 \text{ ft}^{1/3}/\text{sec})/0.013] (2.26 \text{ ft}^2)(0.42 \text{ ft})^{2/3}(0.001)^{1/2}$$

$$Q = 4.64 \text{ cfs} = 2,082 \text{ gpm} = Q_{full}$$

$$v = 4.64 \text{ cfs}/2.26 \text{ ft}^2 = 2.05 \text{ ft/s}$$

$$Q_{max} = 4.64 \text{ cfs} (0.90)(7.48 \text{ gallons/1 cf})(60 \text{ sec/1 min.}) = 1,874 \text{ gpm}$$

Characteristics of 24" ASTM F679, PS115, PVC Sewer Pipe:

$$A = \pi(D_i^2)/4 = \pi(22.891 \text{ in})^2/4 = 411.55 \text{ in}^2 = 2.86 \text{ ft}^2$$

$$P = \pi(D_i) = \pi(22.891 \text{ in}) = 71.91 \text{ in} = 5.99 \text{ ft}$$

$$R = A/P = 2.86 \text{ ft}^2/5.99 \text{ ft} = 0.48 \text{ ft}$$

$$S = 0.0024$$

$$Q = [(1.49 \text{ ft}^{1/3}/\text{sec})/0.013] (2.86 \text{ ft}^2)(0.48 \text{ ft})^{2/3}(0.0024)^{1/2}$$

$$Q = 9.8 \text{ cfs} = 4,398 \text{ gpm} = Q_{full}$$

$$v = 9.8 \text{ cfs}/2.86 \text{ ft}^2 = 3.43 \text{ ft/s}$$

$$Q_{max} = 9.8 \text{ cfs} (0.90)(7.48 \text{ gallons/1 cf})(60 \text{ sec/1 min.}) = 3,958 \text{ gpm}$$

Nominal Main Size (in)	Outer Diameter (in)	Minimum Slope (%)	Area (ft ²)	Hydraulic Radius (A/P) ft	R ^{2/3}	S ^{1/2}	Q-Full (cfs)	Max Pipe (%)	Velocity (ft/s)	Q-Max (gpm)
12	12.500	0.2	0.73	0.24	0.38	0.045	1.45	90	1.99	586
21	22.047	0.1	2.26	0.42	0.56	0.032	4.64	90	2.05	1,874
24	24.803	0.24	2.86	0.48	0.61	0.049	9.8	90	3.43	3,958

VERAMENDI SANITARY SEWER S1-S6
Engineering Design Report
12" PVC SDR 26, 21" & 24" PVC PS115

Conclusion

The proposed 12", 21", and 24" pipe with a minimum slope have sufficient capacity to convey the projected average and peak flows.

GENERAL STRUCTURAL COMPONENTS

Project Materials (Pipe and Joints):

Nominal Pipe Diameter (in)	Linear Feet	Pipe Material	National Standard Specification for Pipe Material	National Standard for Pipe Joints
12"	1198.43	PVC SDR 26	ASTM D3034	ASTM D3212
21"	29.0	PVC SDR 26	ASTM F679	ASTM D3212
24"	5157.3	PVC SDR 26	ASTM F679	ASTM D3212

Note: Section 217.53 (j)(4) requires a minimum pipe diameter of 6 inches for all gravity sanitary sewer collection system piping.

Watertight, size on size resilient connectors conforming to ASTM C-923 have been specified for connecting pipe to manholes. See NBU Standard Specification for Construction Detail.

Where a collection system parallels a water supply pipe and a nine-foot separation distance cannot be achieved, Section 217.53 (d)(3)(A)(i) requires a collection system pipe be constructed of cast iron, ductile iron, or PVC meeting ASTM specifications with at least a 150 pounds per square inch (psi) rating for both the pipe and joints. The proposed project will comply with these requirements.

Where a collection system pipe crosses a water supply line and a nine-foot separation distance cannot be achieved, Section 217.53(d)(3)(B)(i) requires the collection system pipe be constructed of cast iron,

VERAMENDI SANITARY SEWER S1-S6
Engineering Design Report
12" PVC SDR 26, 21" & 24" PVC PS115

ductile iron, or PVC with a minimum pressure rating of 150 psi. The proposed project will comply with this requirement and that of 217.53(d)(3)(B)(iii).

Project Materials (Bedding):

The specified bedding will comply with ASTM D2321-11 Class I, II or III for materials and densification. A minimum of 6 inches of bedding is required for all pipe.

Pipe Diameter (in)	Pipe Material	Bedding Class
12", 21", and 24"	PVC	Class I & Class III

The selection of bedding class is based on NBU detail for sanitary sewer pipe laid in a trench. Initial backfill for the pipe sizes shown above will be Class I. Secondary backfill will be Class III. See Table 2 of ASTM D2321-11 "Soil Classes" in Appendix A of this subsection.

Project Materials (Manholes):

Section 217.55 (f) prohibits the use of bricks to adjust a manhole cover to grade or construct a manhole. The proposed project will comply with this requirement.

The inside diameter of a manhole must be no less than 48 inches.

Section 217.55 (n) requires watertight, size-on-size resilient connectors that allow for differential settlement and must conform to American Society for Testing and Materials C-923. The proposed project complies with this requirement.

Under 30 TAC 213.5(C)(3)(A), all manholes over the Recharge Zone must be watertight, with watertight rings and covers. The proposed project complies with this requirement.

The materials specified for manhole construction are precast concrete.

VERAMENDI SANITARY SEWER S1-S6

Engineering Design Report

12" PVC SDR 26, 21" & 24" PVC PS115

Project Materials (Manhole Covers):

Manhole covers must be constructed of impervious materials. If personnel entry is required, a minimum 30-inch diameter clear opening must be provided. Inclusion of steps in a manhole is prohibited. If a manhole must be located within a 100-year floodplain then a means of preventing inflow is required. A manhole cover that is located in a roadway must meet or exceed the American Association of State Highways and Transportation Officials Standard M-306 for load bearing.

Under 30 TAC 213.5 (c)(3)(A), all manholes over the Edwards Aquifer Recharge Zone must be watertight, with watertight rings and covers. This proposed project complies with this requirement.

Minimum and Maximum Slopes

Note: All pipes are designed with a slope that will provide a velocity of at least 2 ft/s flowing full, as calculated using Manning's equation with an "n" value of 0.013. Additionally, the collection system is designed to ensure that, with pipes flowing full, the velocities will be less than 10 feet per second.

The following are the minimum and maximum slopes for each pipe diameter:

Pipe Diameter: 12" Min. Slope: 0.20% Max. Slope: 4.64%

Pipe Diameter: 21" Min. Slope: 0.10% Max. Slope: 0.10%

Pipe Diameter: 24" Min. Slope: 0.24% Max. Slope: 1.90%

Backfill

Note: The backfill will be free of stones greater than 6 inches in diameter and free of organic or any other unstable material. See NBU details for additional specifications.

Trenching

Note: The trench width will be minimized while still allowing adequate width for proper compaction of backfill, and while still ensuring that at least 6 inches of backfill exists below and on each side of the pipe. The trench walls will be vertical to at least one foot above the pipe.

VERAMENDI SANITARY SEWER S1-S6

Engineering Design Report

12" PVC SDR 26, 21" & 24" PVC PS115

Trenching will occur over the Recharge Zone and will comply with 30 TAC 213.5.

Minimum and Maximum Trench Width

Based on NBU Standard Drawing and 30 TAC 217.54:

Pipe Diameter: 12" Min. Trench Width: 26" Max. Trench Width: 38"

Pipe Diameter: 21" Min. Trench Width: 38" Max. Trench Width: 50"

Pipe Diameter: 24" Min. Trench Width: 41" Max. Trench Width: 53"

These trench widths account for the bell diameter.

Trenchless

Trenchless method by microtunneling through the Comfort Rock Outcrop Complex (CrD) soils is proposed for a section of pipe for installation of a 42" steel casing under existing TX-337 Loop. The pipe will continue as 24" ASTM F679, SDR 26, PVC Sewer Pipe (*PS115*) at a slope of 0.24% for 975 feet between stations 46+37.00 and 56+12.00. This is a new line and this section will not tie into an existing line and no laterals are proposed.

Corrosion Prevention

Proposed collection system components (pipes, manholes, etc.) will not be susceptible to deterioration through the corrosive effects of an anaerobic sewage environment. The interior of the manholes, however, are to be coated with a NBU approved sewer structural coating. Epoxy coating specifically approved. The epoxy coating on the interior walls of the manhole provide interior corrosion protection.

Manholes (General)

Note: Manholes are provided at all changes in size, grade or alignment of pipe, at the intersection of all pipes and at the end of all lines that may be extended at a future date. A clean-out with watertight plugs may be installed instead of a manhole if no extensions are anticipated. Clean outs must pass all testing requirements outlined for gravity collection pipes.

VERAMENDI SANITARY SEWER S1-S6
Engineering Design Report
12" PVC SDR 26, 21" & 24" PVC PS115

The project complies with the maximum manhole spacing allowed by the TCEQ:

Pipe Diameter (in)	Max. Manhole Spacing (ft)
6 - 15	500
18 - 30	800
36 - 48	1000
54 or larger	2000

Manhole Spacing:

Pipe Diameter: 12" Max. Spacing: 448.43 LF

Pipe Diameter: 21" Max. Spacing: N/A

Pipe Diameter: 24" Max. Spacing: 600.00 LF

Manholes (Inverts)

The bottom of a manhole must contain a U-shaped channel, which is a smooth continuation of the inlet, and outlet pipes. The bench above the channel must be sloped a minimum of 0.5 inches per foot. Note, a manhole connected to a pipe less than 15 inches in diameter must have a channel depth equal to at least half the largest pipe's diameter.

Manholes (Ventilation)

A portion of the proposed line crosses in and out of the floodplain therefore watertight manholes are proposed for this SCS. Vented manholes are proposed at required intervals; Vents will minimize inflow. Please see NBU Detail 334.

FLEXIBLE PIPE COMPUTATIONS

Please note, all flexible pipe computations are based on engineering principles and practices for the design of buried PVC pipe systems. Equations used can be found in "The Uni-Bell PVC Pipe Association Handbook of PVC Pipe: Design and Construction". Please note, the equations used may be in a different format than shown in the Uni-Bell Handbook. Throughout this application "160 psi" pipe refers to the

VERAMENDI SANITARY SEWER S1-S6

Engineering Design Report

12" PVC SDR 26, 21" & 24" PVC PS115

pressure rating of the ASTM 2241, Class 160, SDR 26 pipe used at waterline crossings in the SCS. There are no waterline crossings proposed in this application.

Live Load Calculations

Minimum burial depth without concrete encasement or steel casing for the 12" and 24" pipes is five (5) feet. Based on Table 6-6 Live Loads on PVC pipe (from Uni-Bell Handbook for PVC) for this sewer line would be 1.74 psi.

Buckling Pressure Calculations

This area of the Edwards Aquifer is unsaturated; consequently, there are no anticipated areas where sewer pipe will be placed below the water table. The value of $h_w=0$ as there will be no height or time period of perched water or groundwater above the pipe crowns of the proposed sewer line.

The value of H for use in these calculations is twenty (20) feet as it exceeds the maximum burial depth for this line without steel casing. The value of γ_s equals 143 pcf is a conservative value based on a dry unit weight of 135 pcf and a moisture content of 6%. This value is conservative as it corresponds to saturated unit weights of commonly used backfill materials. Please see information from Raba-Kistner provided in Appendix C.

Allowable Buckling Pressure:

$$q_a = 0.4 * \sqrt[2]{32 * R_w * B' * E_b * (E * I / D^3)} \quad \text{Equation 1}$$

$$q_a = 0.4 * \sqrt[2]{32 * 1 * 0.48 * 400(400,000 * 0.009 / 12.019^3)} = 45.15 \text{ psi (12" PVC SDR26)}$$

$$q_a = 0.4 * \sqrt[2]{32 * 1 * 0.48 * 400(400,000 * 0.041 / 21.256^3)} = 40.97 \text{ psi (21" PVC SDR26)}$$

$$q_a = 0.4 * \sqrt[2]{32 * 1 * 0.48 * 400(400,000 * 0.059 / 23.914^3)} = 41.19 \text{ psi (24" PVC SDR26)}$$

$$R_w = 1 - 0.33 * (h_w / h) \quad \text{Equation 2}$$

$$R_w = 1 - 0.33 * (0 / 240) = 1$$

VERAMENDI SANITARY SEWER S1-S6
Engineering Design Report
12" PVC SDR 26, 21" & 24" PVC PS115

$$B' = \frac{I}{1 + 4 * e^{-0.065H}}$$

Equation 3

$$B' = \frac{I}{1 + 4 * e^{-0.065(20)}} = 0.48$$

$$I = (t^3 / 12) * (\text{inches}^4 / \text{linear inch})$$

Equation 4

$$I = (0.481^3 / 12) = 0.009 \text{in}^3 \text{ (12" PVC, SDR 26)}$$

$$I = (0.791^3 / 12) = 0.041 \text{in}^3 \text{ (21" PVC, SDR26)}$$

$$I = (0.889^3 / 12) = 0.059 \text{in}^3 \text{ (24" PVC, SDR26)}$$

$$D = D_o - t$$

Equation 5

$$D = 12.5 \text{inches} - 0.481 \text{inches} = 12.019 \text{inches} \text{ (12" PVC, SDR26)}$$

$$D = 22.047 \text{inches} - 0.791 \text{inches} = 21.256 \text{inches} \text{ (21" PVC, SDR26)}$$

$$D = 24.803 \text{inches} - 0.889 \text{inches} = 23.914 \text{inches} \text{ (24" PVC, SDR26)}$$

Where:

- q_a = Allowable buckling pressure, pounds per square inch (psi)
- h = Height of soil surface above top of pipe in inches (in)
- h_w = Height of water surface above top of pipe in inches (in) (groundwater elevation)
- R_w = Water buoyancy factor. If h_w = 0, R_w = 1. If 0 ≤ h_w ≤ h (groundwater elevation is between the top of the pipe and the ground surface), calculate R_w with Equation 2
- H = Depth of burial in feet (ft) from ground surface to crown of pipe.
- B' = Empirical coefficient of elastic support
- E_b = Modulus of soil reaction for the bedding material (psi)
- E = Modulus of elasticity of the pipe material (psi)
- I = Moment of inertia of the pipe wall cross section per linear inch of pipe, inch⁴/linear inch = inch³. For solid wall pipe, "I" can be calculated with Equation 4
- t = Pipe structural wall thickness (in)
- D = Mean pipe diameter (in)

VERAMENDI SANITARY SEWER S1-S6
Engineering Design Report
12" PVC SDR 26, 21" & 24" PVC PS115

D_o = Pipe outer diameter (in)

Pressure Under Installed Conditions

$$q_p = \gamma_w * h_w + R_w * (W_c / D) + L_l \quad \text{Equation 6}$$

$$q_p = 0.0361 * 0 + 1 * (248.26/12.019) + 1.74 = 22.4 \text{psi (12" PVC, SDR26)}$$

$$q_p = 0.0361 * 0 + 1 * (437.88/21.256) = 20.6 \text{psi (21" PVC, SDR26)}$$

$$q_p = 0.0361 * 0 + 1 * (492.62/23.914) + 1.74 = 22.34 \text{psi (24" PVC, SDR 26)}$$

Where:

q_p = Pressure applied to pipe under installed conditions (psi)

γ_w = 0.0361 pounds per cubic inch (pci), specific weight of water

W_c = Vertical soil load on the pipe per unit length in pounds per linear inch (lb/in)

L_l = Live load (lbs)

$$W_c = \gamma_s * H * (D + t) / 144 \quad \text{Equation 7}$$

$$W_c = 143 * 20 * (12.019 + 0.481) / 144 = 248.26 \text{ lb/in (12" PVC, SDR26)}$$

$$W_c = 143 * 20 * (21.256 + 0.791) / 144 = 437.88 \text{ lb/in (21" PVC, SDR26)}$$

$$W_c = 143 * 20 * (23.914 + 0.889) / 144 = 492.62 \text{ lb/in (24" PVC, SDR26)}$$

γ_s = Specific weight of soil in pounds per cubic foot (pcf)

D = Mean pipe diameter (in)

Pipe Diameter: 12" Pipe Material: PVC, SDR 26 q_a : 45.15 q_p : 22.4

Pipe Diameter: 21" Pipe Material: PVC, SDR 26 q_a : 40.97 q_p : 20.6

Pipe Diameter: 24" Pipe Material: PVC, SDR 29 q_a : 41.19 q_p : 22.34

Since $q_a \geq q_p$, the specific pipe is acceptable for the proposed installation.

VERAMENDI SANITARY SEWER S1-S6

Engineering Design Report

12" PVC SDR 26, 21" & 24" PVC PS115

Wall Crushing Calculations

A portion of the proposed sewer line is located in the 5-year floodplain which will be capped with concrete.

$$H = (24 * P_c * A) / (\gamma_s * D_o) \quad \text{(Equation 8)}$$

$$A = t(\text{in}) \times 12(\text{in} / \text{ft}) \quad \text{(Equation 9)}$$

$$H = (24 * 4,000 * 9.492) / (143 * 22.047) = 289.03 \text{ (21" PVC, SDR 26,)}$$

$$A = 0.791(\text{in}) \times 12(\text{in} / \text{ft}) = 9.492$$

$$H = (24 * 4,000 * 10.668) / (143 * 24.803) = 288.74 \text{ (24" PVC, SDR 26,)}$$

$$A = 0.889(\text{in}) \times 12(\text{in} / \text{ft}) = 10.668$$

D_o = outside pipe diameter, 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.

A = surface area of the pipe wall, in.²/ft [conversion factor of 12 applied to change from ft. to in.]

γ_s = specific weight of soil in pounds per cubic foot (pcf)

H = Depth of burial in feet (ft) from ground surface to crown of pipe.

24 = conversions and coefficients

Installation Temperature Effects

Flexible pipe will be installed under favorable ambient conditions, per pipe manufacturer's specifications.

VERAMENDI SANITARY SEWER S1-S6

Engineering Design Report

12" PVC SDR 26, 21" & 24" PVC PS115

Tensile Strength

The information below is from "The Uni-Bell Handbook of PVC Pipe: Design and Construction" Table 2.1 pages 14-15. This applies to all PVC SDR-26 pipe.

Pipe Material: PVC SDR 26 Tensile Strength: 7,000 Cell Class (PVC only) 12454

Strain

The conditions of this installation are such that strain-related failure will not be a problem. Strain is generally not a performance-limiting factor for buried PVC pipe or a design-limiting criterion for PVC pipes according to the Uni-Bell Handbook of PVC Pipe (Chapter VII, Pages 255 and 257). As pipe deflection will be below 5%, strain-related failure is not anticipated.

Modulus of Soil Reaction

The modulus of soil reaction for the bedding material, E_b , is 400 psi.

This value was determined using the "Table 1: Soil Classification Chart" and "Table 2: Soil Classes" from ASTM D2321-11 and "Average Values of Modulus of Soil Reaction, E' " Table 7.3 from "The Uni-Bell Handbook of PVC Pipe: Design and Construction" attached in Appendix A of this subsection. Based on NBU detail, Class III material was chosen. As the secondary backfill (Class III) has a lower Modulus of Soil Reaction than initial backfill (Class I), its value was used in the calculations that follow. Class III on Table 2 corresponds to coarse-grained soils with fines (GM, GC, SM or SC) and sandy or gravelly fine-grained soils (CL or ML). On Table 7.3, coarse-grained soils with fines at a slight compaction have an E' equal to 400 psi.

The modulus of soil reaction for the in-situ soil, E'_n , is 3,000 psi

This value was determined using the "Table 1: Soil Classification Chart" and "Table 2: Soil Classes" from ASTM D 2321-11 and "Average Values of Modulus of Soil Reaction, E' " Table 7.3 from "The Uni-Bell

VERAMENDI SANITARY SEWER S1-S6
Engineering Design Report
12" PVC SDR 26, 21" & 24" PVC PS115

Handbook of PVC Pipe: Design and Construction" attached in Appendix A of this subsection. Based on NBU detail, Class I material was chosen, which includes crushed rock as shown on Table 2. Compacted crushed rock on Table 7.3 has an E' equal to 3,000 psi. Values in Table 7.3 are based on empirical data and derived from laboratory and field tests for buried pipe.

Bedding to in-situ soil modulus of soil reaction ratio = $E_b/E'_n = 400 \text{ psi}/3,000 \text{ psi} = 0.13$

Zeta Calculation

Where native soil is significantly weaker than bedding material, or where predicted deflection approaches 5%, the effect of native soil must be quantified using Leonhardt's Zeta factor. If the ration of bedding modulus to soil modulus is not equal to 1.0, a zeta factor must be calculated by using the equations below, where zeta is a factor, which corrects for the effect of in-situ soil on pipe stability (Uni-Bell Handbook of Pipe, page 267). To calculate zeta, directly use the formulas below. The calculations that are done to determine the zeta factors for the different pipe diameters must be included with this submittal.

$$zeta = \frac{1.44}{f + (1.44 - f) * (E_b / E'_n)} \quad \text{(Equation 9)}$$

$$zeta = \frac{1.44}{0.99 + (1.44 - 0.99) * 0.13} = 1.37 \text{ (12" PVC SDR26)}$$

$$zeta = \frac{1.44}{0.7 + (1.44 - 0.7) * 0.13} = 1.81 \text{ (21" PVC SDR26)}$$

$$zeta = \frac{1.44}{0.69 + (1.44 - 0.69) * 0.13} = 1.83 \text{ (24" PVC SDR26)}$$

$$f = \frac{b/d_a - 1}{1.154 + 0.444 * (b/d_a - 1)} \quad \text{(Equation 10)}$$

$$f = \frac{38/12.5 - 1}{1.154 + 0.444 * (38/12.5 - 1)} = 0.99 \text{ (12" PVC, SDR 26,)}$$

$$f = \frac{48/22.047 - 1}{1.154 + 0.444 * (48/22.047 - 1)} = 0.70 \text{ (21" PVC, SDR 26, 160 psi)}$$

VERAMENDI SANITARY SEWER S1-S6
Engineering Design Report
12" PVC SDR 26, 21" & 24" PVC PS115

$$f = \frac{53/24.803 - 1}{1.154 + 0.444*(53/24.803 - 1)} = 0.69(24' PVCSDR26)$$

Where:

- f = Pipe/trench width coefficient
- b = Trench width (in)
- d_a = Pipe diameter (in)
- E_b = Modulus of soil reaction for the bedding material (psi)
- E'_n = Modulus of soil reaction for the in-situ soil (psi)

Pipe Diameter: <u>12"</u>	Trench Width: <u>38"</u>	Zeta: <u>1.37</u>
Pipe Diameter: <u>21"</u>	Trench Width: <u>48"</u>	Zeta: <u>1.81</u>
Pipe Diameter: <u>24"</u>	Trench Width: <u>53"</u>	Zeta: <u>1.83</u>

Pipe Stiffness

Ps is based on National Reference Standards and manufacturer's data. Please see Table 7.1 of the "The Uni-Bell Handbook of PVC Pipe: Design and Construction" listing the pipe stiffness of 8" PVC SDR 26 as 115 psi for E = 400,000 psi.

Pipe Diameter: 12", 21", & 24" Pipe Material: PVC SDR 26 Ps: 115 psi

Deflection

Maximum allowable deflection in installed lines is 5% (per 30 TAC 217), as determined by the deflection analysis and verified by a mandrel test. It is recommended that the percent of vertical deflection is below this range; however, a 7.5% deflection limit (recommended by ASTM D3034) provides a conservative factor of safety against structural failure (Handbook of PVC Pipe, page 249).

Note: Per Table 7.2 attached in Appendix A of the SCS Application, K = 0.096 when the bedding angle is 90 degrees. A bedding angle of 90 degrees is required as shown on NBU detail.

VERAMENDI SANITARY SEWER S1-S6
Engineering Design Report
12" PVC SDR 26, 21" & 24" PVC PS115

$$\Delta Y/D(\%) = \frac{K*(L_p+L_1)*100}{(0.149*P_s)+(0.061*zeta*E_b)} \quad \text{(Equation 11)}$$

$$\Delta Y/D(\%) = \frac{(0.096)(19.9 + 1.74) * 100}{(0.149 * 115) + (0.061 * 1.37 * 400)} = 4.12\% \text{ for } 12\text{" pipe}$$

$$\Delta Y/D(\%) = \frac{(0.096)(19.9) * 100}{(0.149 * 115) + (0.061 * 1.81 * 400)} = 3.11\% \text{ for } 21\text{" pipe}$$

$$\Delta Y/D(\%) = \frac{(0.096)(19.9 + 1.74) * 100}{(0.149 * 115) + (0.061 * 1.83 * 400)} = 3.36\% \text{ for } 24\text{" pipe}$$

$$L_p = \frac{\gamma_s * H}{144} \quad \text{(Equation 12)}$$

$$L_p = \frac{143 * 20}{144} = 19.9 \text{ psi}$$

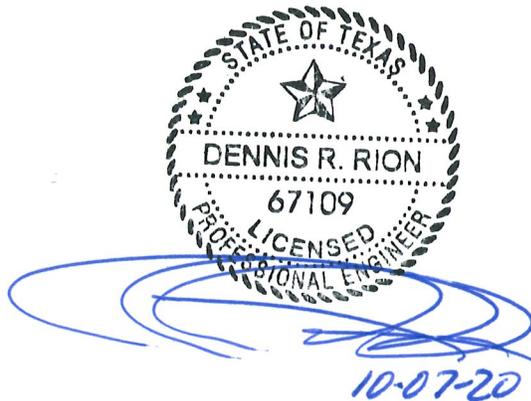
- %ΔY/D = Predicted % vertical deflection under load
- ΔY = Change in vertical pipe diameter under load
- D = Undeformed mean pipe diameter (in)
- K = Bedding angle constant
- γ_s = Unit weight of soil (pcf)
- H = Depth of burial (ft) from ground surface to crown of pipe
- L_p = Prism load (psi)

VERAMENDI SANITARY SEWER S1-S6
Engineering Design Report
12" PVC SDR 26, 21" & 24" PVC PS115

Type of Pipe Material	P _s (psi)	Zeta Factor Assumed or Calculated	E _b (psi)	% Deflection
12" PVC SDR 26	115	1.37	400	4.12
21" PVC SDR 26	115	1.81	400	3.11
24" PVC SDR 26	115	1.83	400	3.36

All pipes proposed for this project have a maximum predicted deflection below 5.0%

Signature, Seal and Date of the Texas Professional Engineer Below:



SCS APPROVAL LETTER

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 17, 2019

Mr. Peter James
Veramendi PE-Darwin, LLC
PO Box 310699
New Braunfels, Texas 78131

Re: Edwards Aquifer, Comal County

NAME OF PROJECT: Veramendi Sanitary Sewer S1-S6; Located approximately 0.3 miles southwest and northwest of River Road and Highway 46-337 intersection; New Braunfels, Texas

TYPE OF PLAN: Request for Approval of an Organized Sewage Collection System (SCS) Plan; 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Additional ID No. 13000985; Regulated Entity No. RN110838364

Dear Mr. James:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the organized sewage collection system plans and specifications for the referenced project submitted to the San Antonio Regional Office on behalf of Veramendi PE-Darwin, LLC by Pape-Dawson Engineers, Inc. on August 23, 2019. Final review of the SCS was completed after additional material was received on October 16, 2019. As presented to the TCEQ, the construction documents were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213 and Chapter 217. Therefore, based on the Texas Licensed Professional Engineer's concurrence of compliance, the planning materials for construction of the proposed sewage collection system 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 (2) two years from the date of this letter unless, prior to the expiration date, more than 10 percent of construction has commenced, or an extension of time has been requested.*

PROJECT DESCRIPTION

This project proposes the construction of 5,157.3 linear feet of 24-inch PVC SDR 26 non-pressure rated (ASTM F679, ASTM D3212); 29.0 linear feet of 21-inch PVC SDR 26 non-pressure rated (ASTM F679, ASTM D3212); and 1,198.43 linear feet of 12-inch PVC SDR 26 non-pressure rated (ASTM D3034, ASTM D3212) sewer main. The proposed sewage collection system will provide disposal service for residential and mixed use development.

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The system will be connected to an existing City of New Braunfels wastewater line for conveyance to the North Kuehler Water Recycling Center for treatment and disposal. The project is located within the City of New Braunfels and will conform to all applicable codes, ordinances, and requirements of the City of New Braunfels.

GEOLOGY

According to the geologic assessment included with the application, the site is located in the leached and collapsed members of the Person Formation and the Regional Dense member of the Person Formation. Four non-sensitive manmade features (manholes) and two non-sensitive geologic features (S-112, fault) were identified by the project geologist. The site investigation conducted on September 23, 2019 and October 9, 2019 revealed the site was generally as described in the application.

SPECIAL CONDITIONS

- I. The geologic assessment indicates that an exposed fault exists on this project site. When excavating in the vicinity of the inferred fault, provide an assessment of it by a Texas Licensed Professional Geologist. If the fault is determined to allow rapid infiltration to the subsurface, construction may not resume in the area of the feature until a protection plan has been reviewed and accepted by the executive director. If the geologist determines that the fault does not allow rapid infiltration to the subsurface, the geologist's assessment must be submitted within 30 days of completion of the assessment. It is recommended that the evaluation of the fault be conducted as early as possible in the scheduled activities to prevent possible delays.
- II. It is emphasized that where wastewater lines must bridge faults, caverns, sinkholes, or solution features the lines shall be constructed in a manner that will maintain the structural integrity of the pipe. When such sensitive features are encountered, 30 TAC §213.5(f)(2) requires that all regulated activities near the feature must be immediately suspended and the owner/developer shall immediately notify the San Antonio Regional Office. Additionally, when such geologic features are encountered which are bridged by construction, the location and extent of those features must be assessed by a geologist and must be reported to the San Antonio Regional Office in writing within two working days of discovery as required by 30 TAC §213.5(c)(3)(K). Construction may not resume in the area of the feature until the executive director has reviewed and approved the methods proposed to protect the aquifer from any potential adverse impacts. See Standard Condition 10 below.
- III. By the responsible engineer's dated signature and seal on the Engineering Design Report attached to the submitted application, all information therein accurately reflects the information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer in accordance with the requirements of 30 TAC 213.5 (c) and Chapter 217.

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. All contractors conducting regulated activities at the project location shall be provided a copy of this notice of approval. At least one complete copy of the approved SCS plan and this notice of approval shall be maintained at the project location until all regulated activities are completed.
5. Modification to the activities described in the referenced SCS application 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.
6. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio 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.
7. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved application, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established, and the construction area is stabilized. 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.

During Construction:

8. During the course of regulated activities related to this project, the applicant or his agent shall comply with all applicable provisions of 30 TAC Chapter 213 and Chapter 217. The applicant shall remain responsible for the provisions and conditions of this approval until such responsibility is legally transferred to another person or entity, upon which that person or entity shall assume responsibility for all provisions and conditions of this approval.
9. 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.
10. 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 San Antonio 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.

11. The following records shall be maintained by the applicant and made available to the executive director upon request: the dates trenching 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 and completed.
12. 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.
13. Intentional discharges of sediment laden stormwater during construction are not allowed. If dewatering of excavated areas becomes necessary, the discharge will be filtered through appropriately selected temporary best management practices. These may include vegetative filter strips, sediment traps, rock berms, silt fence rings, etc.
14. No part of the system shall be used as a holding tank for a pump-and-haul operation.

After Completion of Construction:

15. 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 San Antonio 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 and manholes that were tested and are being certified as complying with the appropriate regulations. 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. 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.

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 San Antonio 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 and manholes 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.

16. 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.
17. 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/San Antonio> Regional Office with the appropriate fees for

Mr. Peter James
Page 5
October 17, 2019

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 Don Vandertulip, PE, BCEE of the Edwards Aquifer Protection Program of the San Antonio Regional Office at (210) 403-4057.

Sincerely,



Robert Sadler, Section Manager
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality

RCS/dv

cc: Mr. Dennis Rion, PE, Pape-Dawson Engineers, Inc.
Mr. Roland Ruiz, Edwards Aquifer Authority
Mr. H. L. Saur, Comal Trinity Groundwater Conservation District
Mr. Thomas H. Hornseth, PE, Comal County
Mr. Robert Camareno, City Manager, City of New Braunfels

**TEMPORARY STORMWATER
SECTION (TCEQ-0602)**

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: Dennis R. Rion, P.E.

Date: 9/22/2020

Signature of Customer/Agent:



Regulated Entity Name: Veramendi Sanitary Sewer S1-S6

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: located within the Construction Staging Area

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: Blieders 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:

- A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.
 - A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.
 - A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.
 - A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.
8. The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.
- Attachment E - Request to Temporarily Seal a Feature.** A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.
 - There will be no temporary sealing of naturally-occurring sensitive features on the site.
9. **Attachment F - Structural Practices.** A description of the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site is attached. Placement of structural practices in floodplains has been avoided.
10. **Attachment G - Drainage Area Map.** A drainage area map supporting the following requirements is attached:
- For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.
 - For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.
 - For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.
 - There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

- There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.
11. **Attachment H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.
- N/A
12. **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.
13. All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.
14. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
15. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.
16. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

Soil Stabilization Practices

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

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

18. Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.
19. Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

Administrative Information

20. All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.
21. If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.
22. Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

ATTACHMENT A

VERAMENDI SANITARY SEWER S1-S6

Temporary Stormwater Section (TCEQ-0602)

Attachment A - Spill Response Actions

In the event of an accidental leak or spill:

- Spill must be contained and cleaned up immediately.
- Spills will not be merely buried or washed with water.
- Contractor shall take action to contain spill. Contractor may use sand or other absorbent material stockpiled on site to absorb spill. Absorbent material should be spread over the spill area to absorb the spilled product.
- In the event of an uncontained discharge the contractor shall utilize onsite equipment to construct berms downgradient of the spill with sand or other absorbent material to contain and absorb the spilled product.
- Spill containment/absorbent materials along with impacted media must be collected and stored in such a way so as not to continue to affect additional media (soil/water). Once the spill has been contained, collected material should be placed on poly or plastic sheeting until removed from the site. The impacted media and cleanup materials should be covered with plastic sheeting and the edges weighed down with paving bricks or other similarly dense objects as the material is being accumulated. This will prevent the impacted media and cleanup materials from becoming airborne in windy conditions or impacting runoff during a rain event. The stockpiled materials should not be located within an area of concentrated runoff such as along a curb line or within a swale.
- Contaminated soils and cleanup materials will be sampled for waste characterization. When the analysis results are known the contaminated soils and cleanup materials will be removed from the site and disposed in a permitted landfill in accordance with applicable regulations.
- The contractor will be required to notify the owner, who will in turn contact TCEQ to notify them in the event of a significant hazardous/reportable quantity spill. Additional notifications as required by the type and amount of spill will be conducted by owner or owner's representative.

In the event of an accidental significant or hazardous spill:

- The contractor will be required to report significant or hazardous spills in reportable quantities to:
 - 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.
 - 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.
 - Notification should first be made by telephone and followed up with a written report.

VERAMENDI SANITARY SEWER S1-S6 Temporary Stormwater Section (TCEQ-0602)

- 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.
- Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.
- Contaminated soils will be sampled for waste characterization. When the analysis results are known the contaminated soils will be removed from the site and disposed in a permitted landfill in accordance with applicable regulations.

Additional guidance can be obtained from TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) Section 1.4.16. Contractor shall review this section.

ATTACHMENT B

VERAMENDI SANITARY SEWER S1-S6

Temporary Stormwater Section (TCEQ-0602)

Attachment B – Potential Sources of Contamination

Other potential sources of contamination during construction include:

- | | | |
|-----------------------------|---|---|
| <i>Potential Source</i> | ● | <i>Asphalt products used on this project.</i> |
| <i>Preventative Measure</i> | ■ | <i>After placement of asphalt, emulsion or coatings, the contractor will be responsible for immediate cleanup should an unexpected rain occur. For the duration of the asphalt product curing time, the contractor will maintain standby personnel and equipment to contain any asphalt wash-off should an unexpected rain occur. The contractor will be instructed not to place asphalt products on the ground within 48 hours of a forecasted rain.</i> |
| <i>Potential Source</i> | ● | <i>Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle dripping.</i> |
| <i>Preventative Measure</i> | ■ | <i>Vehicle maintenance when possible will be performed within the construction staging area.</i> |
| | ■ | <i>Construction vehicles and equipment shall be checked regularly for leaks and repaired immediately.</i> |
| <i>Potential Source</i> | ● | <i>Accidental leaks or spills of oil, petroleum products and substances listed under 40 CFR parts 110, 117, and 302 used or stored temporarily on site.</i> |
| <i>Preventative Measure</i> | ■ | <i>Contractor to incorporate into regular safety meetings, a discussion of spill prevention and appropriate disposal procedures.</i> |
| | ■ | <i>Contractor's superintendent or representative overseer shall enforce proper spill prevention and control measures.</i> |
| | ■ | <i>Hazardous materials and wastes shall be stored in covered containers and protected from vandalism.</i> |
| | ■ | <i>A stockpile of spill cleanup materials shall be stored on site where it will be readily accessible.</i> |

**VERAMENDI SANITARY SEWER S1-S6
Temporary Stormwater Section (TCEQ-0602)**

- Potential Source* • *Miscellaneous trash and litter from construction workers and material wrappings.*
- Preventive Measure* ■ *Trash containers will be placed throughout the site to encourage proper trash disposal.*
- Potential Source* • *Construction debris.*
- Preventive Measure* ■ *Construction debris will be monitored daily by contractor. Debris will be collected weekly and placed in disposal bins. Situations requiring immediate attention will be addressed on a case by case basis.*
- Potential Source* • *Spills/Overflow of waste from portable toilets*
- Preventative Measure* ■ *Portable toilets will be placed away from high traffic vehicular areas and storm drain inlets.*
- *Portable toilets will be placed on a level ground surface.*
- *Portable toilets will be inspected regularly for leaks and will be serviced and sanitized at time intervals that will maintain sanitary conditions.*

ATTACHMENT C

**VERAMENDI SANITARY SEWER S1-S6
Temporary Stormwater Section (TCEQ-0602)**

Attachment C – Sequence of Major Activities

The sequence of major activities which disturb soil during construction on this site will be divided into two stages. The first is site preparation that will include installation of TBMPs illustrated on Exhibit 1, clearing and grubbing of vegetation where applicable. This will disturb approximately 14.66 acres. The second is construction activities in previously-cleared areas, which will include construction of sewer trenches, installation of sewer manholes, pipe, backfilling, and site cleanup including removal of excess material. This will disturb approximately 14.66 acres.

ATTACHMENT D

VERAMENDI SANITARY SEWER S1-S6

Temporary Stormwater Section (TCEQ-0602)

Attachment D – Temporary Best Management Practices and Measures

- a. 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.

Due to the surrounding topography, upgradient water will cross the project limits from adjacent undeveloped land. All TBMPs utilized are adequate for the drainage areas served.

- b. 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.

Site preparation, which is the initiation of all activity on the project, will disturb the largest amount of soil. Therefore, before any of this work can begin, the clearing and grading contractor will be responsible for the installation of all on-site control measures. The methodology for pollution prevention of on-site stormwater will include: (1) erection of silt fences along the downgradient boundary of construction activities for temporary erosion and sedimentation controls, (2) installation of rock berms with silt fencing downgradient from areas of concentrated stormwater flow for temporary erosion control, (3) installation of stabilized construction entrance/exit(s) to reduce the dispersion of sediment from the site, and (5) installation of construction staging area(s).

Prior to the initiation of construction, all previously installed control measures will be repaired or reestablished for their designed or intended purpose. This work, which is the remainder of all activity on the project, may also disturb additional soil. The construction contractor will be responsible for the installation of all remaining on-site control measures that includes installation of the concrete truck washout pit(s), as construction phasing warrants.

Temporary measures are intended to provide a method of slowing the flow of runoff from the construction site in order to allow sediment and suspended solids to settle out of the runoff. By containing the sediment and solids within the site, they will not enter surface streams and/or sensitive features.

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

Temporary measures are intended to provide a method of slowing the flow of runoff from the construction site in order to allow sediment and suspended solids to settle out of the runoff. By containing the sediment and solids within the site, they will not enter surface streams and/or sensitive features.

**VERAMENDI SANITARY SEWER S1-S6
Temporary Stormwater Section (TCEQ-0602)**

- d. 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.

There are no naturally-occurring sensitive features adjacent to, or within, the project limits. BMP measures utilized in this plan are intended to allow stormwater to continue downstream after passing through the BMPs. This will allow stormwater runoff to continue downgradient to streams or features that may exist downstream of the site.

ATTACHMENT F

VERAMENDI SANITARY SEWER S1-S6

Temporary Stormwater Section (TCEQ-0602)

Attachment F – Structural Practices

The following structural measures will be installed prior to the initiation of site preparation activities:

- *Erection of silt fences along the downgradient boundary of construction activities and rock berms with silt fence for secondary protection, as located on Exhibit 1 and illustrated in Exhibit 2.*
- *Installation of stabilized construction entrance/exit(s) and construction staging area(s), as located on Exhibit 1, and illustrated on Exhibit 2.*

The following structural measures will be installed at the initiation of construction activities or as appropriate based on the construction sequencing:

- *Installation of concrete truck washout pit(s), as required and located on Exhibit 1 and illustrated on Exhibit 2.*

ATTACHMENT G

**VERAMENDI SANITARY SEWER S1-S6
Temporary Stormwater Section (TCEQ-0602)**

Attachment G– Drainage Area Map

No more than ten (10) acres will be disturbed within a common drainage area at one time; therefore, all TBMPs utilized are adequate for the drainage areas served.

ATTACHMENT I

VERAMENDI SANITARY SEWER S1-S6

Temporary Stormwater Section (TCEQ-0602)

Attachment I - Inspection and Maintenance for BMP's

Designated and qualified person(s) shall inspect Pollution Control Measures weekly and within 24 hours after a storm event. An inspection report that summarizes the scope of the inspection, names and qualifications of personnel conducting the inspection, date of the inspection, major observations, and actions taken as a result of the inspection shall be recorded and maintained as part of Storm Water TPDES data for a period of three years after the Notice of Termination (NOT) has been filed. A copy of the Inspection Report Form is provided in this Storm Water Pollution Prevention Plan.

As a minimum, the inspector shall observe: (1) significant disturbed areas for evidence of erosion, (2) storage areas for evidence of leakage from the exposed stored materials, (3) structural controls (rock berm outlets, silt fences, drainage swales, etc.) for evidence of failure or excess siltation (over 6 inches deep), (4) vehicle exit point for evidence of off-site sediment tracking, (5) vehicle storage areas for signs of leaking equipment or spills, (6) concrete truck rinse-out pit for signs of potential failure, (7) embankment, spillways, and outlet of sediment basin (where applicable) for erosion damage, and (8) sediment basins (where applicable) for evidence that basin has accumulated 50% of its volume in silt. Deficiencies noted during the inspection will be corrected and documented within seven calendar days following the inspection or before the next anticipated storm event if practicable.

Contractor shall review Sections 1.3 and 1.4 of TCEQ's Technical Guidance Manual for additional BMP inspection and maintenance requirements.

VERAMENDI SANITARY SEWER S1-S6
Temporary Stormwater Section (TCEQ-0602)

Pollution Prevention Measure	Compliance	Corrective Action Required	
		Description (use additional sheet if necessary)	Date Completed
Best Management Practices			
Natural vegetation buffer strips			
Temporary vegetation			
Permanent vegetation			
Sediment control basin			
Silt fences			
Rock berms			
Gravel filter bags			
Drain inlet protection			
Other structural controls			
Vehicle exits (off-site tracking)			
Material storage areas (leakage)			
Equipment areas (leaks, spills)			
Concrete washout pit (leaks, failure)			
General site cleanliness			
Trash receptacles			
Evidence of Erosion			
Site preparation			
Roadway or parking lot construction			
Utility construction			
Drainage construction			
Building construction			
Major Observations			
Sediment discharges from site			
BMPs requiring maintenance			
BMPs requiring modification			
Additional BMPs required			

_____ A brief statement describing the qualifications of the inspector is included in this SWP3.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

"I further certify I am an authorized signatory in accordance with the provisions of 30 TAC §305.128."

VERAMENDI SANITARY SEWER S1-S6
Temporary Stormwater Section (TCEQ-0602)

Inspector's Name

Inspector's Signature

Date

**VERAMENDI SANITARY SEWER S1-S6
Temporary Stormwater Section (TCEQ-0602)**

PROJECT MILESTONE DATES

Date when major site grading activities begin:

<u>Construction Activity</u>	<u>Date</u>
Installation of BMPs	

Dates when construction activities temporarily or permanently cease on all or a portion of the project:

<u>Construction Activity</u>	<u>Date</u>

Dates when stabilization measures are initiated:

<u>Stabilization Activity</u>	<u>Date</u>

ATTACHMENT J

VERAMENDI SANITARY SEWER S1-S6

Temporary Stormwater Section (TCEQ-0602)

Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices

Interim on-site stabilization measures, which are continuous, will include minimizing soil disturbances by exposing the smallest practical area of land required for the shortest period of time and maximizing use of natural vegetation. As soon as practical, all disturbed soil will be stabilized as per project specifications in accordance with pages 1-35 to 1-60 of TCEQ's Technical Guidance Manual (TGM) RG-348 (2005). Mulching, netting, erosion blankets and seeding are acceptable.

Stabilization measures will be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and except as provided below, will be initiated no more than fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within twenty-one (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 seasonably arid conditions, stabilization measures must be initiated as soon as practicable.

**AGENT AUTHORIZATION
FORM (TCEQ-0599)**

SIGNATURE PAGE:

[Signature]
Applicant's Signature

9/29/20
Date

THE STATE OF Texas §

County of Comal §

BEFORE ME, the undersigned authority, on this day personally appeared Peter James 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 29th day of September, 2020.



[Signature]
NOTARY PUBLIC

Emily Lane
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 4/7/23

APPLICATION FEE FORM
(TCEQ-0574)

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Veramendi Sanitary Sewer S1-S6
 Regulated Entity Location: Approx. 0.3 mi SW & NW of River Rd. and TX 337 Loop intersection
 Name of Customer: Veramendi PE - Darwin, LLC
 Contact Person: Peter James Phone: (830) 660-4755
 Customer Reference Number (if issued): CN 605543875
 Regulated Entity Reference Number (if issued): RN 110838364

Austin Regional Office (3373)

- Hays Travis Williamson

San Antonio Regional Office (3362)

- Bexar Medina Uvalde
 Comal Kinney

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

- Austin Regional Office San Antonio Regional Office
 Mailed to: TCEQ - Cashier Overnight Delivery to: TCEQ - Cashier
 Revenues Section 12100 Park 35 Circle
 Mail Code 214 Building A, 3rd Floor
 P.O. Box 13088 Austin, TX 78753
 Austin, TX 78711-3088 (512)239-0357

Site Location (Check All That Apply):

- Recharge Zone Contributing Zone Transition Zone

<i>Type of Plan</i>	<i>Size</i>	<i>Fee Due</i>
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	\$
Sewage Collection System	L.F.	\$
Lift Stations without sewer lines	Acres	\$
Underground or Aboveground Storage Tank Facility	Tanks	\$
Piping System(s)(only)	Each	\$
Exception	1 Each	\$ 500
Extension of Time	Each	\$

Signature: 

Date: 09/22/2020

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

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

Organized Sewage Collection Systems and Modifications

<i>Project</i>	<i>Cost per Linear Foot</i>	<i>Minimum Fee- Maximum Fee</i>
Sewage Collection Systems	\$0.50	\$650 - \$6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

<i>Project</i>	<i>Cost per Tank or Piping System</i>	<i>Minimum Fee- Maximum Fee</i>
Underground and Aboveground Storage Tank Facility	\$650	\$650 - \$6,500

Exception Requests

<i>Project</i>	<i>Fee</i>
Exception Request	\$500

Extension of Time Requests

<i>Project</i>	<i>Fee</i>
Extension of Time Request	\$150

**CORE DATA FORM
(TCEQ-10400)**



TCEQ Core Data Form

TCEQ Use Only

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

SECTION I: General Information

1. Reason for Submission (If other is checked please describe in space provided.)		
<input checked="" type="checkbox"/> New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)		
<input type="checkbox"/> Renewal (Core Data Form should be submitted with the renewal form)	<input type="checkbox"/> Other	
2. Customer Reference Number (if issued)	Follow this link to search for CN or RN numbers in	3. Regulated Entity Reference Number (if issued)
CN 605543875		RN 110838364

SECTION II: Customer Information

4. General Customer Information	5. Effective Date for Customer Information Updates (mm/dd/yyyy)		
<input type="checkbox"/> New Customer <input type="checkbox"/> Update to Customer Information <input type="checkbox"/> Change in Regulated Entity Ownership <input type="checkbox"/> Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)			
The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).			
6. Customer Legal Name (If an individual, print last name first: e.g.: Doe, John)		If new Customer, enter previous Customer below:	
Veramendi PE - Darwin, LLC			
7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number (if applicable)
0802689865	32063351814	38-403632	
11. Type of Customer:	<input type="checkbox"/> Corporation	<input type="checkbox"/> Individual	Partnership: <input type="checkbox"/> General <input checked="" type="checkbox"/> Limited
Government: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Other	<input type="checkbox"/> Sole Proprietorship	<input type="checkbox"/> Other:	
12. Number of Employees		13. Independently Owned and Operated?	
<input checked="" type="checkbox"/> 0-20 <input type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input type="checkbox"/> 251-500 <input type="checkbox"/> 501 and higher		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
14. Customer Role (Proposed or Actual) - as it relates to the Regulated Entity listed on this form. Please check one of the following:			
<input type="checkbox"/> Owner <input type="checkbox"/> Operator <input checked="" type="checkbox"/> Owner & Operator <input type="checkbox"/> Occupational Licensee <input type="checkbox"/> Responsible Party <input type="checkbox"/> Voluntary Cleanup Applicant <input type="checkbox"/> Other:			
15. Mailing Address:	PO Box 310699		
	City	New Braunfels	State TX ZIP 78131 ZIP + 0699
16. Country Mailing Information (if outside USA)		17. E-Mail Address (if applicable)	
		peter@asaproperties.us.com	
18. Telephone Number		19. Extension or Code	20. Fax Number (if applicable)
(830) 660 - 4755			() -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (If "New Regulated Entity" is selected below this form should be accompanied by a permit application)	
<input type="checkbox"/> New Regulated Entity	<input type="checkbox"/> Update to Regulated Entity Name <input type="checkbox"/> Update to Regulated Entity Information
The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).	
22. Regulated Entity Name (Enter name of the site where the regulated action is taking place.)	
Veramendi Sanitary Sewer S1-S6	

23. Street Address of the Regulated Entity: (No PO Boxes)								
	City		State		ZIP		ZIP +	
24. County	Comal							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	Approx. 0.3 miles SW and NW of River Rd. and Hwy 46/337 intersection								
26. Nearest City	New Braunfels				State	TX		Nearest ZIP Code	78130
27. Latitude (N) In Decimal:	29.728181			28. Longitude (W) In Decimal:	-98.131320				
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds				
29	43	41.5	98	07	52.8				
29. Primary SIC Code (4 digits)	30. Secondary SIC Code (4 digits)		31. Primary NAICS Code (5 or 6 digits)		32. Secondary NAICS Code (5 or 6 digits)				
1623			237110						
33. What is the Primary Business of this entity? (Do not repeat the SIC or NAICS description.)									
Organized sanitary sewer									
34. Mailing Address:	PO Box 310699								
	City	New Braunfels	State	TX	ZIP	78131	ZIP + 4	0699	
35. E-Mail Address:	peter@asaproperties.us.com								
36. Telephone Number			37. Extension or Code		38. Fax Number (if applicable)				
(830) 660 - 4755					() -				

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. See the Core Data Form instructions for additional guidance.

<input type="checkbox"/> Dam Safety	<input type="checkbox"/> Districts	<input checked="" type="checkbox"/> Edwards Aquifer	<input type="checkbox"/> Emissions Inventory Air	<input type="checkbox"/> Industrial Hazardous Waste
<input type="checkbox"/> Municipal Solid Waste	<input type="checkbox"/> New Source Review Air	<input type="checkbox"/> OSSF	<input type="checkbox"/> Petroleum Storage Tank	<input type="checkbox"/> PWS
<input type="checkbox"/> Sludge	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Title V Air	<input type="checkbox"/> Tires	<input type="checkbox"/> Used Oil
<input type="checkbox"/> Voluntary Cleanup	<input type="checkbox"/> Waste Water	<input type="checkbox"/> Wastewater Agriculture	<input type="checkbox"/> Water Rights	<input type="checkbox"/> Other

SECTION IV: Preparer Information

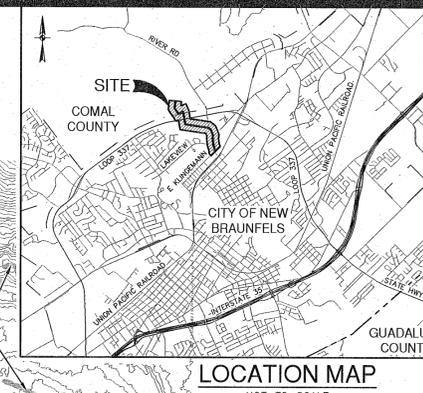
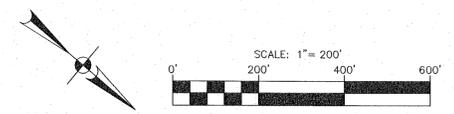
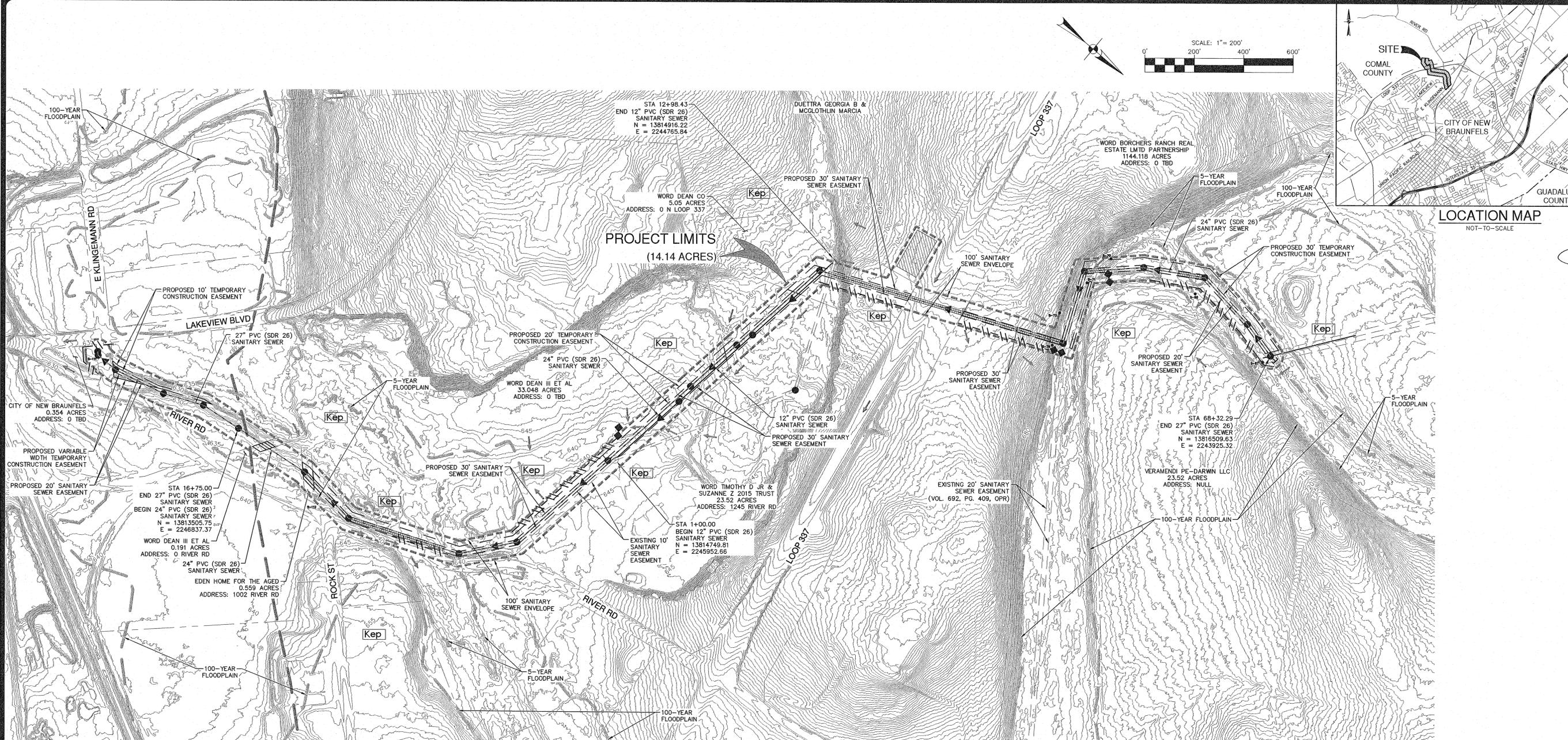
40. Name:	Jean Autrey, P.E., CESSWI		41. Title:	Project Engineer
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address	
(210) 375 - 9000		(210) 375 - 9010	jautrey@pape-dawson.com	

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 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	Pape-Dawson Engineers, Inc.	Job Title:	Executive Vice President
Name (In Print):	Dennis Rion, P.E.	Phone:	(210) 375 - 9000
Signature:		Date:	10/6/2020

EXHIBITS



DATE	
NO.	REVISION

PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
 1672 INDEPENDENCE DR. STE. 102 | NEW BRAUNFELS, TX 78132 | 210.375.9000
 TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION #470

VERAMENDI SANITARY SEWER S1-S6
 NEW BRAUNFELS, TEXAS

OVERALL SEWER LAYOUT
SEWAGE COLLECTION SYSTEM

JOB NO. 7620-56
 DATE JULY 2019
 DESIGNER RM
 CHECKED JD DRAWN BS
 SHEET C1.00

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

- A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE 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.
- ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN (WPA) 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.
- IF ANY SENSITIVE FEATURE(S) (CAVES, SOLUTION CAVITY, SINK HOLE, ETC.) 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. CONSTRUCTION ACTIVITIES MAY NOT BE RESUMED UNTIL THE TCEQ HAS REVIEWED AND APPROVED THE APPROPRIATE PROTECTIVE MEASURES IN ORDER TO PROTECT ANY SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY.
- NO TEMPORARY OR PERMANENT HAZARDOUS SUBSTANCE STORAGE TANK SHALL BE INSTALLED WITHIN 150 FEET OF A WATER SUPPLY SOURCE, DISTRIBUTION SYSTEM, WELL, OR SENSITIVE FEATURE.
- PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND MANUFACTURERS SPECIFICATIONS. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
- ANY SEDIMENT THAT ESCAPES THE CONSTRUCTION SITE MUST BE COLLECTED AND PROPERLY DISPOSED OF BEFORE THE NEXT RAIN EVENT TO ENSURE IT IS NOT WASHED INTO SURFACE STREAMS, SENSITIVE FEATURES, ETC.
- SEDIMENT MUST BE REMOVED FROM THE SEDIMENT TRAPS OR SEDIMENTATION BASINS NOT LATER THAN WHEN IT OCCUPIES 50% OF THE BASIN'S DESIGN CAPACITY.
- LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER SHALL BE PREVENTED FROM BEING DISCHARGED OFFSITE.
- 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.
- IF PORTIONS OF THE SITE WILL HAVE A TEMPORARY OR PERMANENT CEASE IN CONSTRUCTION ACTIVITY LASTING LONGER THAN 14 DAYS, SOIL STABILIZATION IN THOSE AREAS SHALL BE INITIATED AS SOON AS POSSIBLE PRIOR TO THE 14TH DAY OF INACTIVITY. IF ACTIVITY WILL RESUME PRIOR TO THE 21ST DAY, STABILIZATION MEASURES ARE NOT REQUIRED. IF DROUGHT CONDITIONS OR INCLEMENT WEATHER PREVENT ACTION BY THE 14TH DAY, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS POSSIBLE.
- 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.
- THE HOLDER OF ANY APPROVED EDWARDS 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.

SAN ANTONIO REGIONAL OFFICE
 14250 JUDSON ROAD
 SAN ANTONIO, TEXAS 78233-4480
 PHONE (210) 490-3096
 FAX (210) 545-4329

GENERAL NOTES:

- DO NOT DISTURB VEGETATED AREAS (TREES, GRASS, WEEDS, BRUSH, ETC.) ANY MORE THAN NECESSARY FOR CONSTRUCTION.
- LOCATIONS OF CONSTRUCTION ENTRANCE/EXITS, CONCRETE WASHOUT PITS, AND CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE YARDS TO BE DETERMINED IN THE FIELD.
- STORM WATER POLLUTION PREVENTION CONTROLS MAY NEED TO BE MODIFIED IN THE FIELD TO ACCOMPLISH THE DESIRED EFFECT. ALL MODIFICATIONS ARE TO BE NOTED ON THIS EXHIBIT AND SIGNED AND DATED BY THE RESPONSIBLE PARTY.
- RESTRICT ENTRY/EXIT TO THE PROJECT SITE TO DESIGNATED LOCATIONS BY USE OF ADEQUATE FENCING, IF NECESSARY.
- ALL STORM WATER POLLUTION PREVENTION CONTROLS ARE TO BE MAINTAINED AND IN WORKING CONDITIONS AT ALL TIMES.
- CONTRACTOR, TO THE EXTENT PRACTICAL, SHALL MINIMIZE THE AMOUNT OF AREA DISTURBED, AS SOON AS PRACTICAL, ALL DISTURBED SOIL THAT WILL NOT BE COVERED BY IMPERVIOUS COVER SUCH AS PARKWAY AREAS, EASEMENT AREAS, EMBANKMENT SLOPES, ETC. WILL BE STABILIZED PER APPLICABLE PROJECT SPECIFICATIONS.
- BEST MANAGEMENT PRACTICES MAY BE INSTALLED IN STAGES TO COINCIDE WITH THE DISTURBANCE OF UPGRADIENT AREAS.
- BEST MANAGEMENT PRACTICES MAY BE REMOVED IN STAGES ONCE THE WATERSHED FOR THAT PORTION CONTROLLED BY THE BEST MANAGEMENT PRACTICES HAS BEEN STABILIZED.
- ALL TEMPORARY BMPS WILL BE REMOVED ONCE WATERSHED IS STABILIZED.
- MUD OR DIRT INADVERTENTLY TRACKED OFF-SITE AND ONTO EXISTING STREETS SHALL BE REMOVED IMMEDIATELY BY HAND OR MECHANICAL BROOM SWEEPING.
- PRIOR TO INITIATION OF SUBSEQUENT PHASES OF CONSTRUCTION, TEMPORARY BMPS INCLUDING SILT FENCING, CONSTRUCTION ENTRANCE/EXIT, CONCRETE WASHOUT PIT, AND CONSTRUCTION STAGING AREA SHALL BE FIELD LOCATED AS APPROPRIATE FOR THE AREA OF CONSTRUCTION.
- TEMPORARY POLLUTION ABATEMENT MEASURES SHOWN ON THE PLAN ARE FOR THE OVERALL DEVELOPMENT. TEMPORARY BMPS MAY REQUIRE ADJUSTMENT BASED ON PHASING OF CONSTRUCTION OF THE DEVELOPMENT. RECORDS OF ADJUSTMENTS AND REVISIONS SHALL BE MAINTAINED AS APPROPRIATE.
- TEMPORARY BMPS SHOWN ON THIS SHEET ARE FOR GRAPHICAL PURPOSES AND MAY NOT BE TO SCALE. BMPS SHALL BE LOCATED WITHIN THE PROJECT LIMITS.
- UPON COMPLETION OF THE PROJECT AND BEFORE FINAL PAYMENT IS ISSUED, CONTRACTOR SHALL REMOVE ALL SEDIMENT AND EROSION CONTROL MEASURES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION SEQUENCING AND REMOVAL OF TEMPORARY POLLUTION ABATEMENT MEASURES THAT CONFLICT WITH SITE IMPROVEMENTS SUCH AS LANDSCAPING AND FENCES SO AS TO PREVENT SEDIMENT FROM ESCAPING THE PROJECT SITE.

LEGEND:

- 100' SANITARY SEWER ENVELOPE
- EXISTING CONTOUR
- SILT FENCE
- GRAVEL FILTER BAGS
- ROCK BERM
- EXISTING FLOW ARROW
- STABILIZED CONSTRUCTION ENTRANCE/EXIT (FIELD LOCATE)
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA (FIELD LOCATE)
- CONCRETE TRUCK WASH-OUT PIT (FIELD LOCATE)
- PERSON FORMATION
- POTENTIAL RECHARGE FEATURE

TEMPORARY BMP MODIFICATIONS

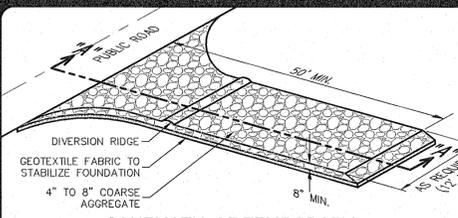
DATE	SIGNATURE	DESCRIPTION

THE ENGINEERING SEAL HAS BEEN AFFIXED TO THIS SHEET ONLY FOR THE PURPOSE OF DEMONSTRATING COMPLIANCE WITH THE POLLUTION ABATEMENT SIZING AND TREATMENT REQUIREMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S EDWARDS AQUIFER TECHNICAL GUIDANCE MANUAL.

THIS SHEET HAS BEEN PREPARED FOR PURPOSES OF POLLUTION ABATEMENT ONLY. ALL OTHER CIVIL ENGINEERING RELATED INFORMATION SHOULD BE ACQUIRED FROM THE APPROPRIATE SHEET IN THE CIVIL IMPROVEMENT PLANS.

EXHIBIT 1

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SCHEMATIC OF TEMPORARY CONSTRUCTION ENTRANCE/EXIT

MATERIALS

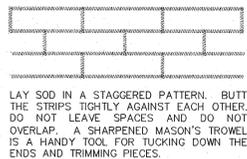
1. THE AGGREGATE SHOULD CONSIST OF 4-INCH TO 8-INCH WASHED STONE OVER A STABLE FOUNDATION AS SPECIFIED IN THE PLAN.
2. THE AGGREGATE SHOULD BE PLACED WITH A MINIMUM THICKNESS OF 8-INCHES.
3. THE GEOTEXTILE FABRIC SHOULD BE DESIGNED SPECIFICALLY FOR USE AS A SOIL FILTRATION MEDIA WITH AN APPROXIMATE WEIGHT OF 6 OZ/YD², A MULLEN BURST RATING OF 140 LB/IN², AND AN EQUIVALENT OPENING SIZE GREATER THAN A NUMBER 50 SIEVE.
4. IF A WASHING FACILITY IS REQUIRED, A LEVEL AREA WITH A MINIMUM OF 4-INCH DIAMETER WASHED STONE OR COMMERCIAL ROCK SHOULD BE INCLUDED IN THE PLANS. DIVERT WASTEWATER TO A SEDIMENT TRAP OR BASIN.

INSTALLATION

1. AVOID CURVES ON PUBLIC ROADS AND STEEP SLOPES. REMOVE VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA. GRADE CROWN FOUNDATION FOR POSITIVE DRAINAGE.
2. THE MINIMUM WIDTH OF THE ENTRANCE/EXIT SHOULD BE 12 FEET OR THE FULL WIDTH OF EXIT ROADWAY, WHICHEVER IS GREATER.
3. THE CONSTRUCTION ENTRANCE SHOULD BE AT LEAST 50 FEET LONG.
4. IF THE SLOPE TOWARD THE ROAD EXCEEDS 2% CONSTRUCT A RIDGE, 6-INCHES TO 8-INCHES HIGH WITH 3:1 (H:V) SIDE SLOPES. ACROSS THE FOUNDATION APPROXIMATELY 15 FEET FROM THE ENTRANCE TO DIVERT RUNOFF AWAY FROM THE PUBLIC ROAD.
5. PLACE GEOTEXTILE FABRIC AND GRADE FOUNDATION TO IMPROVE STABILITY, ESPECIALLY WHERE WET CONDITIONS ARE ANTICIPATED.
6. PLACE STONE TO DIMENSIONS AND GRADE SHOWN ON PLANS. LEAVE SURFACE SMOOTH AND SLOPE FOR DRAINAGE.
7. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN.
8. INSTALL PIPE UNDER PAD AS NEEDED TO MAINTAIN PROPER PUBLIC ROAD DRAINAGE.

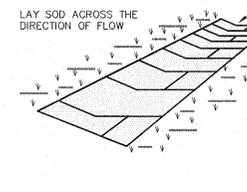
STABILIZED CONSTRUCTION ENTRANCE/EXIT DETAIL

NOT-TO-SCALE

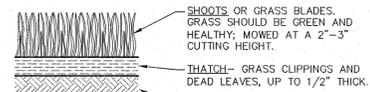


LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER. DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARPENED MASON'S TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.

NOTES:
1. BUTTING - ANGLED ENDS CAUSED BY THE AUTOMATIC SOD CUTTER MUST BE MATCHED CORRECTLY.

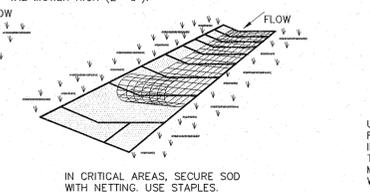


LAY SOD ACROSS THE DIRECTION OF FLOW



APPEARANCE OF GOOD SOD

- NOTES:**
1. ROLL SOD IMMEDIATELY TO ACHIEVE FIRM CONTACT WITH THE SOIL.
 2. WATER TO A DEPTH OF 4" AS NEEDED. WATER WELL AS SOON AS THE SOD IS LAID.
 3. MOW WHEN THE SOD IS ESTABLISHED - IN 2-3 WEEKS. SET THE MOWER HIGH (2"-3").



IN CRITICAL AREAS, SECURE SOD WITH NETTING, USE STAPLES.

MATERIALS

1. SOD SHOULD BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 3/4" INCH (E. 1/4" INCH) AT THE TIME OF CUTTING. THIS THICKNESS SHOULD EXCLUDE SHOOT GROWTH AND THATCH.
2. PIECES OF SOD SHOULD BE CUT TO THE SUPPLIER'S STANDARD WIDTH AND LENGTH WITH A MAXIMUM ALLOWABLE DEVIATION IN ANY DIMENSION OF 5%. TORN OR UNEVEN PADS SHOULD NOT BE ACCEPTABLE.
3. STANDARD SIZE SECTIONS OF SOD SHOULD BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SHAPE WHEN SUSPENDED FROM A FIRM GRASP ON ONE END OF THE SECTION.
4. SOD SHOULD BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS.

SITE PREPARATION

1. PRIOR TO SOIL PREPARATION, AREAS TO BE SODDED SHOULD BE BROUGHT TO FINAL GRADE IN ACCORDANCE WITH THE APPROVED PLAN.
2. THE SURFACE SHOULD BE CLEARED OF ALL TRASH, DEBRIS AND OF ALL ROOTS, BRUSH, WIRE, GRADE STAKES AND OTHER OBJECTS THAT WOULD INTERFERE WITH PLANTING, FERTILIZING OR MAINTENANCE OPERATIONS.
3. FERTILIZE ACCORDING TO SOIL TESTS. FERTILIZER NEEDS CAN BE DETERMINED BY A SOIL TESTING LABORATORY OR REGIONAL RECOMMENDATIONS CAN BE MADE BY COUNTY AGRICULTURAL EXTENSION AGENTS. FERTILIZER SHOULD BE WORKED INTO THE SOIL TO A DEPTH OF 3 INCHES WITH A DISC, SPRINGTOOTH HARROW OR OTHER SUITABLE EQUIPMENT. ON SLOPING LAND, THE FINAL HARROWING OR DISCING OPERATION SHOULD BE ON THE CONTOUR.

INSTALLATION IN CHANNELS

1. SOD STRIPS IN WATERWAYS SHOULD BE LAID PERPENDICULAR TO THE DIRECTION OF FLOW. CARE SHOULD BE TAKEN TO BUTT ENDS OF STRIPS TIGHTLY (SEE FIGURE ABOVE).
2. AFTER ROLLING OR TAMPING, SOD SHOULD BE PEGGED OR STAPLED TO RESIST WASHOUT DURING THE ESTABLISHMENT PERIOD. MESH OR OTHER NETTING MAY BE PEGGED OVER THE SOD FOR EXTRA PROTECTION IN CRITICAL AREAS.

SOD INSTALLATION DETAIL

NOT-TO-SCALE

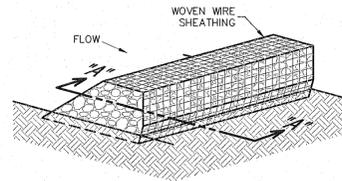
SECTION "A-A" OF A CONSTRUCTION ENTRANCE/EXIT

COMMON TROUBLE POINTS

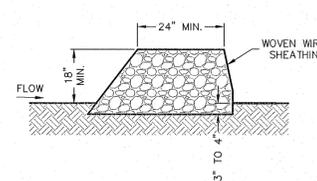
1. INADEQUATE RUNOFF CONTROL-SEDIMENT WASHES ONTO PUBLIC ROAD.
2. STONE TOO SMALL OR GEOTEXTILE FABRIC ABSENT, RESULTS IN MUDDY CONDITION AS STONE IS PRESSED INTO SOIL.
3. PAD TOO SHORT FOR HEAVY CONSTRUCTION TRAFFIC-EXTEND PAD BEYOND THE MINIMUM 50-FOOT LENGTH AS NECESSARY.
4. PAD NOT FLARED SUFFICIENTLY AT ROAD SURFACE, RESULTS IN MUD BEING TRACKED ON TO ROAD AND POSSIBLE DAMAGE TO ROAD.
5. UNSTABLE FOUNDATION - USE GEOTEXTILE FABRIC UNDER PAD AND/OR IMPROVE FOUNDATION DRAINAGE.

INSPECTION 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.
1. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.
 2. WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
 3. 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.
 4. ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE BY USING APPROVED METHODS.



ISOMETRIC PLAN VIEW



SECTION "A-A"

ROCK BERMS

THE PURPOSE OF A ROCK BERM IS TO SERVE AS A CHECK DAM IN AREAS OF CONCENTRATED FLOW, TO INTERCEPT SEDIMENT-LADEN RUNOFF, DETAIN THE SEDIMENT AND RELEASE THE WATER IN SHEET FLOW. THE ROCK BERM SHOULD BE USED WHEN THE CONTRIBUTING DRAINAGE AREA IS LESS THAN 5 ACRES. ROCK BERMS ARE USED IN AREAS WHERE THE VOLUME OF RUNOFF IS TOO GREAT FOR A SILT FENCE TO CONTAIN. THEY ARE LESS EFFECTIVE FOR SEDIMENT REMOVAL THAN SILT FENCES, PARTICULARLY FOR FINE PARTICLES, BUT ARE ABLE TO WITHSTAND HIGHER FLOWS THAN A SILT FENCE. AS SUCH, ROCK BERMS ARE OFTEN USED IN AREAS OF CHANNEL FLOWS (DITCHES, GULLIES, ETC.). ROCK BERMS ARE MOST EFFECTIVE AT REDUCING BED LOAD IN CHANNELS AND SHOULD NOT BE SUBSTITUTED FOR OTHER EROSION AND SEDIMENT CONTROL MEASURES FARTHER UP THE WATERSHED.

INSPECTION AND MAINTENANCE GUIDELINES

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 LAID IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

MATERIALS

1. THE BERM STRUCTURE SHOULD BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM OPENING OF 1 INCH AND A MINIMUM WIRE DIAMETER OF 20 GAUGE GALVANIZED AND SHOULD BE SECURED WITH SHOAT RINGS.
2. CLEAN, OPEN GRADED 3-INCH TO 5-INCH DIAMETER ROCK SHOULD BE USED, EXCEPT IN AREAS WHERE HIGH VELOCITIES OR LARGE VOLUMES OF FLOW ARE EXPECTED, WHERE 5-INCH TO 8-INCH DIAMETER ROCKS MAY BE USED.

INSTALLATION

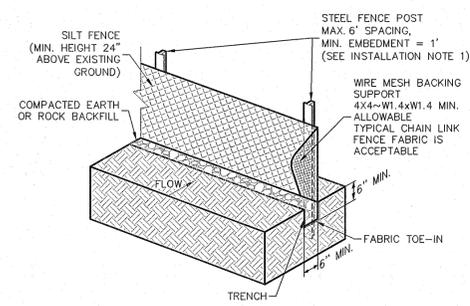
1. LAY OUT THE WOVEN WIRE SHEATHING PERPENDICULAR TO THE FLOW LINE. THE SHEATHING SHOULD BE 20 GAUGE WOVEN WIRE MESH WITH 1 INCH OPENINGS.
2. BERM SHOULD HAVE A TOP WIDTH OF 2 FEET MINIMUM WITH SIDE SLOPES BEING 2:1 (H:V) OR FLATTER.
3. PLACE THE ROCK ALONG THE SHEATHING AS SHOWN IN THE DIAGRAM TO A HEIGHT NOT LESS THAN 18".
4. WRAP THE WIRE SHEATHING AROUND THE ROCK AND SECURE WITH THE WIRE SO THAT THE ENDS OF THE SHEATHING OVERLAP AT LEAST 2 INCHES, AND THE BERM RETAINS ITS SHAPE WHEN WALKED UPON.
5. BERM SHOULD BE BUILT ALONG THE CONTOUR AT ZERO PERCENT GRADE OR AS NEAR AS POSSIBLE.
6. THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROXIMATELY 3 TO 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.

COMMON TROUBLE POINTS

1. INSUFFICIENT BERM HEIGHT OR LENGTH (RUNOFF QUICKLY ESCAPES OVER THE TOP OR AROUND THE SIDES OF BERM).
2. BERM NOT INSTALLED PERPENDICULAR TO FLOW LINE (RUNOFF ESCAPING AROUND ONE SIDE).

ROCK BERM DETAIL

NOT-TO-SCALE



ISOMETRIC PLAN VIEW

SILT FENCE

A SILT FENCE IS A BARRIER CONSISTING OF GEOTEXTILE FABRIC SUPPORTED BY METAL POSTS TO PREVENT SOIL AND SEDIMENT LOSS FROM A SITE. WHEN PROPERLY USED, SILT FENCES CAN BE HIGHLY EFFECTIVE AT CONTROLLING SEDIMENT FROM DISTURBED AREAS. THEY CAUSE RUNOFF TO POND, ALLOWING HEAVIER SOLIDS TO SETTLE OUT. IF NOT PROPERLY INSTALLED, SILT FENCES ARE NOT LIKELY TO BE EFFECTIVE.

THE PURPOSE OF A SILT FENCE IS TO INTERCEPT AND DETAIN WATER-BORN SEDIMENT FROM UNPROTECTED AREAS OF A LIMITED EXTENT. SILT FENCE IS USED DURING THE PERIOD OF CONSTRUCTION NEAR THE PERIMETER OF A DISTURBED AREA TO INTERCEPT SEDIMENT WHILE ALLOWING WATER TO PERCOLATE THROUGH. THIS FENCE SHOULD REMAIN IN PLACE UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED. SILT FENCE SHOULD NOT BE USED WHERE THERE IS A CONCENTRATION OF WATER IN A CHANNEL OR DRAINAGE WAY. IF CONCENTRATED FLOW OCCURS AFTER INSTALLATION, CORRECTIVE ACTION MUST BE TAKEN SUCH AS PLACING A ROCK BERM IN THE AREAS OF CONCENTRATED FLOW.

SILT FENCING WITHIN THE SITE MAY BE TEMPORARILY MOVED DURING THE DAY TO ALLOW CONSTRUCTION ACTIVITY PROVIDED IT IS REPLACED AND PROPERLY ANCHORED TO THE GROUND AT THE END OF THE DAY. SILT FENCES ON THE PERIMETER OF THE SITE OR AROUND DRAINAGE WAYS SHOULD NOT BE MOVED AT ANY TIME.

MATERIALS

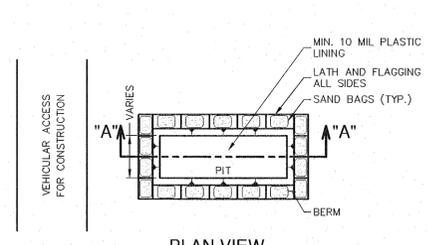
1. SILT FENCE MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE, OR POLYAMIDE WOVEN OR NONWOVEN FABRIC. THE FABRIC SHOULD BE 36 INCHES, WITH A MINIMUM UNIT WEIGHT OF 4.5 OZ/YD, MULLEN BURST STRENGTH EXCEEDING 190 LB/IN², ULTRAVIOLET STABILITY EXCEEDING 70%, AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NUMBER 30.
2. FENCE POSTS SHOULD BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR Y-BAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM WEIGHT 1.25 LB/FT, AND BRINDLE HARNNESS EXCEEDING 140.
3. WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.

INSTALLATION

1. STEEL POSTS, WHICH SUPPORT THE SILT FENCE, SHOULD BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POSTS MUST BE EMBEDDED A MINIMUM OF 1-FOOT DEEP AND SPACED NOT MORE THAN 8 FEET ON CENTER. WHERE WATER CONCENTRATES, THE MAXIMUM SPACING SHOULD BE 6 FEET.
2. LAY OUT FENCING DOWN-SLOPE OF DISTURBED AREA, FOLLOWING THE CONTOUR AS CLOSELY AS POSSIBLE. THE FENCE SHOULD BE SITED SO THAT THE MAXIMUM DRAINAGE AREA IS 1/4 ACRE/100 FEET OF FENCE.

SILT FENCE DETAIL

NOT-TO-SCALE

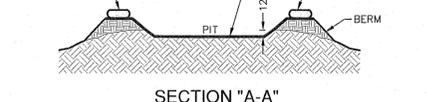


PLAN VIEW

SECTION "A-A"

GRAVEL FILTER BAG DETAIL

NOT-TO-SCALE



SECTION "A-A"

GENERAL NOTES

1. DETAIL ABOVE ILLUSTRATES MINIMUM DIMENSIONS. PIT CAN BE INCREASED IN SIZE DEPENDING ON EXPECTED FREQUENCY OF USE.
2. WASHOUT PIT SHALL BE LOCATED IN AN AREA EASILY ACCESSIBLE TO CONSTRUCTION TRAFFIC.
3. WASHOUT PIT SHALL NOT BE LOCATED IN AREAS SUBJECT TO INUNDATION FROM STORM WATER RUNOFF.
4. LOCATE WASHOUT AREA AT LEAST 50 FEET FROM SENSITIVE FEATURES, STORM DRAINS, OPEN DITCHES OR WATER BODIES.
5. TEMPORARY CONCRETE WASHOUT FACILITY SHOULD BE CONSTRUCTED WITH SUFFICIENT QUANTITY AND VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS.

MATERIALS

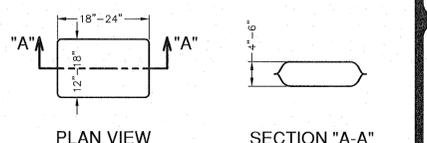
PLASTIC LINING MATERIAL SHOULD BE A MINIMUM OF 10 MIL IN POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL.

MAINTENANCE

1. WHEN TEMPORARY CONCRETE WASHOUT FACILITIES ARE NO LONGER REQUIRED FOR THE WORK, THE HARDENED CONCRETE SHOULD BE REMOVED AND DISPOSED OF.
2. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF.
3. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCES CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE BACKFILLED AND REPAIRED.

CONCRETE TRUCK WASHOUT PIT DETAIL

NOT-TO-SCALE

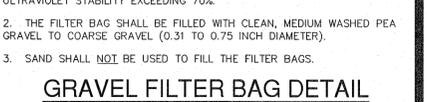


PLAN VIEW

SECTION "A-A"

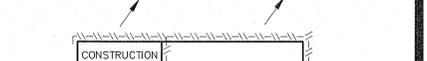
CONSTRUCTION STAGING AREA

NOT-TO-SCALE



CONSTRUCTION STAGING AREA

NOT-TO-SCALE



LEGEND

CONSTRUCTION AND WASTE MATERIAL STORAGE AREA

ENTRANCE / EXIT

FIELD OFFICE

SILT FENCE

FLOW ARROWS

CONSTRUCTION STAGING AREA

NOT-TO-SCALE

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VERAMENDI SANITARY SEWER S1-S6
NEW BRAUNFELS, TEXAS
SEWAGE COLLECTION SYSTEM
TYPICAL DETAILS

NO.	REVISION	DATE



PAPE-DAWSON ENGINEERS
NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
1072 INDEPENDENCE DR., STE. 102 | NEW BRAUNFELS, TX 77852 | 713.675.6000
TEXAS BOARD OF PROFESSIONAL ENGINEERS, P.E. REGISTRATION #470

JOB NO.	7620-56
DATE	JULY 2019
DESIGNER	RM
CHECKED	JD
DRAWN	BS
SHEET	1 OF 1

EXHIBIT 3

DATE: Aug. 22, 2019, 10:56am. User: D:\B01090002. File: P:\26\2016\56\Design\Environmental\SCS\SCS01-762056.dwg

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**FINAL PLAN AND PROFILE
SHEETS**

NBU SEWER NOTES

- 1. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION.
2. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, RELIANT ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND GAS VALVES THAT ARE IN THE PROJECT AREAS.
3. ALL 8" SEWER PIPE AND FITTINGS IN THIS PROJECT ARE P.V.C. SDR-26, ASTM, D-3034, D-3212, F-477.
4. ALL RESIDENTIAL SEWER SERVICE LATERALS SHALL BE EXTENDED TO THE PROPERTY LINE AND CAPPED AND SEALED.
5. INITIAL BACKFILL OF SEWER LINES SHALL BE 3/4" TO DUST OR PEA GRAVEL AS PER NBU SPECIFICATIONS.
6. SECONDARY BACKFILL OF SEWER LINES SHALL GENERALLY CONSIST OF MATERIALS REMOVED FROM THE TRENCH AND SHALL BE FREE FROM BRUSH, DEBRIS AND TRASH, NO ROCKS OR STONES HAVING ANY DIMENSION LARGER THAN 6 INCHES AT THE LARGEST DIMENSION.
7. ALL SEWER PIPES SHALL HAVE COMPRESSION OR MECHANICAL JOINTS AS PER 31 TAC 313.5 (C) (2)(X).
8. FOR SEWER LINES LESS THAN 24" IN DIAMETER, SELECT INITIAL BACKFILL MATERIAL.
a. THE FIRST LIFT SHALL BE SPREAD UNIFORMLY AND SIMULTANEOUSLY ON EACH SIDE AND UNDER THE SHOULDERS OF THE PIPE TO THE MID POINT OR SPRING LINE OF THE PIPE.
b. THE SECOND LIFT SHALL BE PLACED TO A DEPTH AS SHOWN ON THE PIPE BACKFILL DETAIL. FOR PIPES LARGER THAN 24", 12" MAXIMUM LIFTS SHALL BE USED.
9. ALL MANHOLES MUST BE WATER TIGHT, EITHER MONOLITHIC, CAST-IN-PLACE CONCRETE STRUCTURES OR PREFABRICATED MANHOLES SPECIFICALLY APPROVED BY NBU. THE MANHOLES SHALL HAVE WATER-TIGHT RINGS AND COVERS. WHEREVER THEY ARE WITHIN THE 100 YEAR FLOODPLAIN, THE MANHOLE COVERS SHALL BE BOLTED. EVERY FOURTH MANHOLE IN SEQUENCE SHALL HAVE AN ALTERNATE MEANS OF VENTING. 31 TAC 313.5 C) (1) AND 31 TAC 317.2 (C) (5)(F).
10. ALL MANHOLES SHALL BE CONSTRUCTED SO THAT THE TOP OF THE RING IS SURROUNDING GROUND EXCEPT WHEN LOCATED IN PAVED AREA. IN PAVED AREAS, THE MANHOLE RING SHALL BE FLUSH WITH PAVEMENT.
11. ALL NEW MANHOLES ARE TO HAVE COVERS WITH 32" OPENINGS.
12. SEWER PIPE CONNECTIONS TO PRE-CAST MANHOLES WILL BE COMPRESSION JOINTS OR MECHANICAL "BOOT TYPE" JOINT AS APPROVED BY NBU.
13. SEWER LINES SHALL BE TESTED FROM MANHOLE TO MANHOLE.
14. IN AREAS WHERE A NEW SANITARY SEWER MANHOLE IS TO BE CONSTRUCTED OVER AN EXISTING SANITARY SEWER SYSTEM, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO TEST THE EXISTING MANHOLES BEFORE CONSTRUCTION. AFTER THE PROPOSED MANHOLE(S) HAS BEEN BUILT, THE CONTRACTOR SHALL RE-TEST THE EXISTING SYSTEM TO THE SATISFACTION OF THE CONSTRUCTION INSPECTOR. (NO SEPARATE PAY ITEM).
15. WHERE THE MINIMUM 9 FOOT SEPARATION DISTANCE BETWEEN SEWER LINES AND WATER LINES / MAINS CANNOT BE MAINTAINED, THE INSTALLATION OF SEWER LINES SHALL BE IN STRICT ACCORDANCE WITH TCEQ. THE WASTEWATER LINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC MEETING THE ASTM SPECIFICATION FOR BOTH PIPES AND JOINTS OF 150 PSI AND SHALL BE IN ACCORDANCE WITH 30 TAC 290.44 (E)(5).
16. AFTER CONSTRUCTION, TESTING WILL BE DONE BY TV CAMERA BY THE CONTRACTOR AND OBSERVED BY INSPECTOR OF WATER SYSTEMS ENGINEERING PERSONNEL, AS THE CAMERA IS RUN THROUGH THE LINES. ANY ABNORMALITIES FOUND IN THE LINE, SUCH AS BROKEN PIPE OR MECHANICAL JOINTS, MUST BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE. CONTRACTOR TO PROVIDE TV TAPES TO CONSTRUCTION INSPECTION FOR REVIEW PRIOR TO FINAL INSPECTION OF THE PROJECT.
17. WATER SETTING THE BACKFILL WITHIN A STREET WILL NOT BE PERMITTED. SANITARY SEWER TRENCHES SUBJECT TO TRAFFIC SHALL CONFORM TO NBU CONNECTION & CONSTRUCTION POLICY MANUAL.
18. NO TESTING WILL BE PERFORMED PRIOR TO 30 DAYS FROM COMPLETE INSTALLATION OF THE SANITARY SEWER LINES. THE FOLLOWING SEQUENCE WILL BE STRICTLY ADHERED TO:
a. PULL MANDREL
b. PERFORM AIR TEST
19. WHERE REQUIRED, CONCRETE ENCASEMENT SHALL BE PLACED AS SHOWN ON THE STANDARD DETAIL SHEET.
20. A MINIMUM OF 3 FEET OF COVER IS TO BE MAINTAINED OVER THE SANITARY SEWER MAIN AND LATERALS AT SUBGRADE, OTHERWISE CONCRETE ENCASEMENT WILL BE REQUIRED.
21. SANITARY SEWER MAIN CONNECTIONS MADE DIRECTLY TO EXISTING MANHOLES WILL REQUIRE SUCCESSFUL TESTING OF THE MANHOLE IN ACCORDANCE WITH NBU CONNECTION & CONSTRUCTION POLICY MANUAL.
22. TCEQ AND EPA REQUIRE EROSION AND SEDIMENTATION CONTROL FOR CONSTRUCTION OF SEWER COLLECTION SYSTEMS. DEVELOPER OR AUTHORIZED REPRESENTATIVE SHALL PROVIDE EROSION AND SEDIMENTATION CONTROL AS NOTES ON THE PROJECT'S PLAN AND PROFILE SHEETS. ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED BY THE CONTRACTOR AT FINAL ACCEPTANCE OF THE PROJECT BY NBU WATER SYSTEMS.
23. ALL MANHOLES NOT WITHIN PAVED STREETS SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER NBU DETAIL DRAWING #329.
24. ALL MANHOLES OVER THE EDWARDS AQUIFER RECHARGE ZONE SHALL HAVE LOCKING CONCRETE COLLAR TO SECURE RING AND COVER TO MANHOLE CONE PER NBU DETAIL DRAWING #329.
25. ALL SEWER SERVICES SHALL HAVE CLEANOUT INSTALLED AT PROPERTY LINE PER NBU DETAIL DRAWING #302 AND #303.

CITY OF NEW BRAUNFELS UTILITY NOTES

- 1. ALL UTILITY TRENCH COMPACTON TESTS WITHIN THE STREET PAVEMENT SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEO-TECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEO-TECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 100LF FOR EACH LIFT. UPON COMPLETION OF TESTING THE GEO-TECHNICAL ENGINEER SHALL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.
2. ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS.
3. THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5- FEET IN DEPTH. DEEP TRENCHES POSE COMPACTON TESTING AND CONSTRUCTION CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTON MAY NOT BE ACHIEVABLE. A UTILITY COMPACTON PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY INSTALLATION.

NBU GENERAL NOTES

- 1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THE PROJECT SHALL BE APPROVED BY NEW BRAUNFELS UTILITIES AND COMPLY WITH THE CURRENT "NEW BRAUNFELS UTILITIES WATER SYSTEMS CONNECTION/CONSTRUCTION POLICIES WATER SYSTEMS".
2. CONTRACTOR SHALL NOT PROCEED WITH ANY PIPE INSTALLATION WORK UNTIL THEY OBTAIN A COPY OF THE PLANS FROM THE CONSULTANT OR ENGINEER AND NOTIFY NBU WATER SYSTEMS ENGINEERING AT 830-608-8971 WITH AT LEAST THREE (3) WORKING DAYS (72 HOURS) NOTICE. WORK COMPLETED BY THE CONTRACTOR, WHICH HAS NOT RECEIVED A NOTICE TO PROCEED WITH NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING WILL BE SUBJECT TO REMOVAL AND REPLACEMENT BY AND AT THE EXPENSE OF THE CONTRACTOR.
3. THE DEVELOPER DEDICATES THE WATER / WASTEWATER MAINS UPON COMPLETION BY THE DEVELOPER AND ACCEPTANCE BY THE NEW BRAUNFELS UTILITIES WATER SYSTEM. NBU WILL OWN AND MAINTAIN SAID WATER / WASTEWATER MAINS WHICH ARE LOCATED WITHIN SAID PARTICULAR SUBDIVISION. (AS APPLICABLE).
4. CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNERS AND THE ENGINEER AND HIS EMPLOYEES, PARTNERS OFFICERS, DIRECTORS, OR CONSULTANTS HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT, EXCEPT FROM LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE OWNER OR ENGINEER, ENGINEER'S DIRECTORS, OFFICERS, EMPLOYEES, OR CONSULTANTS.
5. CONTRACTOR AND / OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL OR BETTER CONDITION, ANY DAMAGES DONE TO EXISTING CURBS, FENCES, STREETS, DRIVEWAYS, LANDSCAPING AND STRUCTURES, AND EXISTING UTILITIES (NOT ADJUSTED ON PLANS). COST OF RESTORATIONS, IF ANY, SHALL BE THE CONTRACTOR'S ENTIRE EXPENSE.
7. THE CONTRACTOR SHALL AVOID CUTTING ROOTS LARGER THAN ONE INCH IN DIAMETER WHEN EXCAVATING NEAR EXISTING TREES. EXCAVATION IN VICINITY OF TREES SHALL PROCEED WITH CAUTION.
8. CONTRACTOR SHALL PROCURE ALL PERMITS AND LICENSES, PAY ALL CHARGES, FEES AND TAXES AND GIVE ALL NOTICES NECESSARY AND INCIDENTAL TO THE DUE AND LAWFUL PROSECUTION OF THE WORK.
9. NO EXTRA PAYMENT SHALL BE ALLOWED FOR WORK CALLED FOR ON THE PLANS BUT NOT INCLUDED ON THE BID SCHEDULE. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED UNDER THE PAY ITEM TO WHICH IT RELATES.
10. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL WASTE MATERIALS UPON PROJECT COMPLETION. THE CONTRACTOR SHALL NOT REMOVE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAN DEVELOPMENT PERMIT.
11. THE CONTRACTOR SHALL NOT PLACE ANY MATERIALS ON THE RECHARGE ZONE OF THE EDWARDS AQUIFER WITHOUT AN APPROVED WATER POLLUTION ABATEMENT PLAN FROM THE TCEQ 31 TAC 313.4 AND 31 TAC 313.9.
12. BARRICADES AND WARNING SIGNS SHALL CONFORM TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND SHALL BE LOCATED TO PROVIDE MAXIMUM PROTECTION TO THE PUBLIC AS WELL AS CONSTRUCTION PERSONNEL AND EQUIPMENT WHILE PROVIDING CONTINUOUS TRAFFIC FLOW AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL DEVICES DURING CONSTRUCTION.
13. CONTRACTOR IS REQUIRED TO VERIFY PROJECT ELEVATIONS. THE TERM "MATCH EXISTING" SHALL BE UNDERSTOOD TO SIGNIFY BOTH HORIZONTAL AND VERTICAL ALIGNMENT.
14. THE LOCATION OF UTILITIES, EITHER UNDERGROUND OR OVERHEAD, SHOWN WITHIN THE RIGHT OF WAY ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE BEGINNING CONSTRUCTION OPERATIONS.
15. OSHA REGULATIONS PROHIBIT OPERATIONS THAT WILL BRING PERSONS OR EQUIPMENT WITHIN 10 FEET OF AN ENERGIZED LINE. WHERE WORKMEN AND/OR EQUIPMENT HAVE TO WORK CLOSE TO AN ENERGIZED ELECTRICAL LINE, THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL POWER COMPANY INVOLVED AND MAKE WHATEVER ADJUSTMENTS NECESSARY TO ENSURE THE SAFETY OF THOSE WORKMEN.
16. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION. UTILITY COMPANIES ARE ALSO PREVIOUSLY MENTIONED IN "UTILITY COMPANY NOTIFICATION".
17. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192 (B), GAS COMPANIES MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.
18. THE CONTRACTOR IS FULLY RESPONSIBLE FOR THE TRAFFIC CONTROL AND WILL BE RESPONSIBLE FOR FURNISHING ALL TRAFFIC CONTROL DEVICES, AND FLAGGERS. THE CONSTRUCTION METHODS SHALL BE CONDUCTED TO PROVIDE THE LEAST POSSIBLE INTERFERENCE TO TRAFFIC SO AS TO PERMIT THE CONTINUOUS MOVEMENT OF THE TRAFFIC IN ONE DIRECTION AT ALL TIMES. THE CONTRACTOR SHALL CLEAN UP AND REMOVE FROM THE WORK AREA ANY LOOSE MATERIAL RESULTING FROM CONTRACT OPERATIONS AT THE END OF EACH WORKDAY.
19. PRIOR TO ORDERING MATERIALS TO BE USED IN CONSTRUCTION, CONTRACTOR SHALL PROVIDE THE ENGINEER WITH FOUR (4) COPIES OF THE SOURCE, TYPE, GRADATION, MATERIAL SPECIFICATION DATA AND / OR SHOP DRAWINGS, AS APPLICABLE, TO SATISFY THE REQUIREMENTS OF THE FOLLOWING ITEMS AND ALL MATERIAL ITEMS REFERRED TO IN THESE LISTED ITEMS:
a. WATER MAINS AND SERVICES
b. SEWER MAINS AND SERVICES
20. NO METER BOXES TO BE SET IN DRIVEWAYS. ANY METER BOXES SET IN DRIVEWAYS WILL BE RELOCATED AT CONTRACTOR'S AND/OR DEVELOPER'S EXPENSE.
21. WHERE THE MINIMUM 9 FOOT SEPARATION DISTANCE BETWEEN SEWER LINES AND WATER LINES / MAINS CANNOT BE MAINTAINED, THE INSTALLATION OF SEWER LINES SHALL BE IN STRICT ACCORDANCE WITH TCEQ.
22. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
23. UTILITY TRENCH COMPACTON WITH STREET R.O.W.
a. ALL UTILITY TRENCH COMPACTON TEST WITHIN THE STREET PAVEMENT SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEO-TECHNICAL ENGINEER.
b. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE.
c. EACH LAYER OF MATERIAL SHALL BE COMPACTED AS SPECIFIED AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E.
d. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEO-TECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR.
e. UPON COMPLETION OF TESTING THE GEO-TECHNICAL ENGINEER SHALL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.

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

- 1. THIS ORGANIZED SEWAGE COLLECTION SYSTEM (SCS) MUST BE CONSTRUCTED IN ACCORDANCE WITH 30 TEXAS ADMINISTRATIVE CODE (TAC) §213.5(C), THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S (TCEQ) EDWARDS AQUIFER RULES AND ANY LOCAL GOVERNMENT STANDARD SPECIFICATIONS.
2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROPOSED REGULATED PROJECT MUST BE PROVIDED WITH COPIES OF THE SCS PLAN AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS MUST BE REQUIRED TO KEEP ON-SITE COPIES OF THE PLAN AND THE APPROVAL LETTER.
3. A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE PRESIDING TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES. THIS NOTICE MUST INCLUDE:
- THE NAME OF THE APPROVED PROJECT;
- THE ACTIVITY START DATE; AND
- THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.
4. ANY MODIFICATION TO THE ACTIVITIES DESCRIBED IN THE REFERENCED SCS APPLICATION FOLLOWING THE DATE OF APPROVAL MAY REQUIRE THE SUBMITTAL OF AN SCS APPLICATION TO MODIFY THIS APPROVAL, INCLUDING THE PAYMENT OF APPROPRIATE FEES AND ALL INFORMATION NECESSARY FOR ITS REVIEW AND APPROVAL.
5. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (EAS) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
6. IF ANY SENSITIVE FEATURES ARE DISCOVERED DURING THE WASTEWATER LINE TRENCHING ACTIVITIES, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPLICANT MUST IMMEDIATELY NOTIFY THE APPROPRIATE REGIONAL OFFICE OF THE TCEQ OF THE FEATURE DISCOVERED, A GEOLOGIST'S ASSESSMENT OF THE LOCATION AND EXTENT OF THE FEATURE DISCOVERED AND A PLAN FOR ENSURING THE STRUCTURAL INTEGRITY OF THE SEWER LINE OR FOR MODIFYING THE PROPOSED COLLECTION SYSTEM ALIGNMENT AROUND THE SENSITIVE FEATURE. THE REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST NOT PROCEED UNTIL THE EXECUTIVE DIRECTOR HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT THE SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM ANY POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY WHILE MAINTAINING THE STRUCTURAL INTEGRITY OF THE LINE.
7. SEWER LINES LOCATED WITHIN OR CROSSING THE 5-YEAR FLOODPLAIN OF A DRAINAGE WAY WILL BE PROTECTED FROM INUNDATION AND STREAM VELOCITIES WHICH COULD CAUSE EROSION AND SCOURING OF BACKFILL. THE TRENCH MUST BE CAPPED WITH CONCRETE TO PREVENT SCOURING OF BACKFILL, OR THE SEWER LINES MUST BE ENCASED IN CONCRETE. ALL CONCRETE SHALL HAVE A MINIMUM THICKNESS OF 6 INCHES.
8. BLASTING PROCEDURES FOR PROTECTION OF EXISTING SEWER LINES AND OTHER UTILITIES WILL BE IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION CRITERIA. SAND IS NOT ALLOWED AS BACKFILL IN TRENCHES THAT HAVE BEEN BLASTED. ANY EXISTING SEWER LINES ARE DAMAGED, THE LINES MUST BE REPAIRED AND RETESTED.
9. ALL MANHOLES CONSTRUCTED OR REHABILITATED ON THIS PROJECT MUST HAVE WATER TIGHT 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 100 FEET OF COVER OR FOR MORE THAN 1000 FEET, ALTERNATE MEANS OF VENTING WILL BE PROVIDED. BRICKS ARE NOT AN ACCEPTABLE CONSTRUCTION MATERIAL FOR ANY PORTION OF THE MANHOLE.
10. 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 C2.00-C2.06.

IT IS SUGGESTED THAT ENTRANCE INTO MANHOLES IN EXCESS OF FOUR FEET DEEP BE ACCOMPLISHED BY MEANS OF A PORTABLE LADDER. THE INCLUSION OF STEPS IN A MANHOLE IS PROHIBITED.

- 10. WHERE WATER LINES AND NEW SEWER LINE ARE INSTALLED WITH A SEPARATION DISTANCE CLOSER THAN NINE FEET (I.E., WATER LINES CROSSING WASTEWATER LINES, WATER LINES PARALLELING WASTEWATER LINES, OR WATER LINES NEXT TO MANHOLES) THE INSTALLATION MUST MEET THE REQUIREMENTS OF 30 TAC §217.53(D) (PIPE DESIGN) AND 30 TAC §290.44(E) (WATER DISTRIBUTION).

- 11. WHERE SEWERS LINES DEVIATE FROM STRAIGHT ALIGNMENT AND UNIFORM GRADE ALL CURVATURE OF SEWER PIPE MUST BE ACHIEVED BY THE FOLLOWING PROCEDURE WHICH IS RECOMMENDED BY THE PIPE MANUFACTURER: PP 819 1IN (PLASTICS PIPE BULLETIN).

IF PIPE FLEXURE IS PROPOSED, THE FOLLOWING METHOD OF PREVENTING DEFLECTION OF THE JOINT MUST BE USED: ASTM D2657.

- 12. NEW SEWAGE COLLECTION SYSTEM LINES MUST BE CONSTRUCTED WITH STUB OUTS FOR THE CONNECTION OF ANTICIPATED EXTENSIONS. THE LOCATION OF SUCH STUB OUTS MUST BE MARKED ON THE GROUND SUCH THAT THEIR LOCATION CAN BE EASILY DETERMINED AT THE TIME OF CONNECTIONS. SUCH STUB OUTS MUST BE MANUFACTURED CAP OR TEE TYPES 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 SEALING 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 CONSTRUCTED 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 N/A OF N/A (FOR POTENTIAL FUTURE LATERALS). NOT USED. NO LATERALS SHALL BE CONNECTED TO THE LIFT STATION.

THE PRIVATE SERVICE LATERAL STUB-OUTS MUST BE INSTALLED AS SHOWN ON THE PLAN AND PROFILE SHEETS ON PLAN SHEET N/A OF N/A AND MARKED AFTER BACKFILLING AS SHOWN IN THE DETAIL ON PLAN SHEET N/A OF N/A. NOT USED. NO STUBOUTS WILL BE INSTALLED FOR THE LIFT STATION.

- 13. TRENCHING, BEDDING AND BACKFILL MUST CONFORM WITH 30 TAC §217.54. THE BEDDING AND BACKFILL FOR FLEXIBLE PIPE MUST COMPLY WITH THE STANDARDS OF ASTM D-2321, CLASSIFIED IA, IB, II OR III. RIGID PIPE BEDDING MUST COMPLY WITH THE REQUIREMENTS OF ASTM C 12 (ANSI A 106-2) CLASSES A, B OR C.

- 14. SEWER LINES MUST BE TESTED FROM MANHOLE TO MANHOLE. WHEN A NEW SEWER LINE IS CONNECTED TO AN EXISTING STUB OR CLEAN-OUT, IT MUST BE TESTED FROM EXISTING MANHOLE TO NEW MANHOLE. IF A STUB OR CLEAN-OUT IS USED AT THE END OF THE PROPOSED SEWER LINE, NO PRIVATE SERVICE ATTACHMENTS MAY BE CONNECTED BETWEEN THE LAST MANHOLE AND THE CLEANOUT UNLESS IT CAN BE CERTIFIED AS CONFORMING WITH THE PROVISIONS OF 30 TAC §213.5(C)(3)(E).

- 15. ALL SEWER LINES MUST BE TESTED IN ACCORDANCE WITH 30 TAC §217.57. THE ENGINEER MUST RETURN COPIES OF ALL TEST RESULTS WHICH MUST BE MADE AVAILABLE TO THE EXECUTIVE DIRECTOR. 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:
(a) A LOW PRESSURE AIR TEST 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:
(i) LOW PRESSURE AIR TEST:
(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.
(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.
(i) THERE MUST BE A VACUUM OF 3.5 POUNDS PER SQUARE INCH (PSI) GREATER THAN THE PRESSURE EXERTED BY GROUNDWATER ABOVE THE PIPE.
(ii) IF 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=0.085 x D x 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 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.

(C) SINCE A K VALUE OF LESS THAN 1.0 MAY NOT BE USED, THE MINIMUM TESTING TIME FOR EACH PIPE DIAMETER IS SHOWN IN THE FOLLOWING TABLE C.3:

Table with 4 columns: PIPE DIAMETER (INCHES), MINIMUM TIME (SECONDS), MAXIMUM LENGTH FOR MINIMUM TIME (FEET), TIME FOR LONGER LENGTH (SECONDS/FOOT). Rows include diameters from 6 to 33 inches.

- (D) AN OWNER MAY STOP A TEST IF NO PRESSURE LOSS HAS OCCURRED DURING THE FIRST 25% OF THE CALCULATED TESTING TIME.
(E) IF ANY PRESSURE LOSS OR LEAKAGE HAS OCCURRED DURING THE FIRST 25% OF A TESTING PERIOD, THEN THE TEST MUST CONTINUE FOR THE ENTIRE TEST DURATION AS OUTLINED ABOVE OR UNTIL FAILURE.
(F) WASTEWATER COLLECTION SYSTEM PIPES WITH A 27 INCH OR LARGER AVERAGE INSIDE DIAMETER MAY BE AIR TESTED AT EACH JOINT INSTEAD OF FOLLOWING THE PROCEDURE OUTLINED IN THIS SECTION.
(G) A TESTING PROCEDURE FOR PIPE WITH AN INSIDE DIAMETER GREATER THAN 33 INCHES MUST BE APPROVED BY THE EXECUTIVE DIRECTOR.
(2) INFILTRATION/EXFILTRATION TEST.
(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.
(B) AN OWNER SHALL USE AN INFILTRATION TEST IN LIEU OF AN EXFILTRATION TEST WHEN PIPES ARE INSTALLED BELOW THE GROUNDWATER LEVEL.
(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.
(D) FOR CONSTRUCTION WITHIN A 25-YEAR FLOOD PLAIN, THE INFILTRATION OR EXFILTRATION MUST NOT EXCEED 10 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT THE SAME MINIMUM TEST HEAD AS IN SUBPARAGRAPH (C) OF THIS PARAGRAPH.
(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.

(b) IF A GRAVITY COLLECTION PIPE IS COMPOSED OF FLEXIBLE PIPE, DEFLECTION TESTING IS ALSO REQUIRED. THE FOLLOWING PROCEDURES MUST BE FOLLOWED:

- (1) FOR A COLLECTION PIPE WITH INSIDE DIAMETER LESS THAN 27 INCHES, DEFLECTION MEASUREMENT REQUIRES A RIGID MANDREL.
(A) MANDREL SIZING.
(i) 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 ASTM'S, AMERICAN WATER WORKS ASSOCIATION, UNI-BELL, OR AMERICAN NATIONAL STANDARDS INSTITUTE, OR ANY RELATED APPENDIX.
(ii) 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 THE 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.
(iii) ALL DIMENSIONS MUST MEET THE APPROPRIATE STANDARD.
(B) MANDREL DESIGN.
(i) A RIGID MANDREL MUST BE CONSTRUCTED OF A METAL OR A RIGID PLASTIC MATERIAL THAT CAN WITHSTAND 200 PSI WITHOUT BEING DEFORMED.
(ii) A MANDREL MUST HAVE NINE OR MORE OOD NUMBER RUNNERS OR LEGS.
(iii) A BARREL SECTION LENGTH MUST EQUAL AT LEAST 75% OF THE INSIDE DIAMETER OF A PIPE.
(iv) EACH SIZE MANDREL MUST USE A SEPARATE PROVING RING.
(C) METHOD OPTIONS.
(i) AN ADJUSTABLE OR FLEXIBLE MANDREL IS PROHIBITED.
(ii) A TEST MAY NOT USE TELEVISION INSPECTION AS A SUBSTITUTE FOR A DEFLECTION TEST.
(iii) IF REQUESTED, THE EXECUTIVE DIRECTOR MAY APPROVE THE USE OF A DEFLECTOMETER OR A MANDREL WITH REMOVABLE LEGS OR RUNNERS ON DEFORMABLE CASE-BASE CASES.
(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.
(3) A DEFLECTION TEST METHOD MUST BE ACCURATE TO WITHIN PLUS OR MINUS 0.2% DEFLECTION.
(4) AN OWNER SHALL NOT CONDUCT A DEFLECTION TEST UNTIL AT LEAST 30 DAYS AFTER THE FINAL BACKFILL.
(5) GRAVITY COLLECTION SYSTEM PIPE DEFLECTION MUST NOT EXCEED FIVE PERCENT (5%).
(6) IF A PIPE SECTION FAILS A DEFLECTION TEST, AN OWNER SHALL CORRECT THE PROBLEM AND CONDUCT A SECOND TEST AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS.

- 16. ALL MANHOLES MUST BE TESTED TO MEET OR EXCEED THE REQUIREMENTS OF 30 TAC §217.58.
(a) ALL MANHOLES MUST PASS A LEAKAGE TEST.
(b) AN OWNER SHALL TEST EACH MANHOLE (AFTER ASSEMBLY AND BACKFILLING) FOR LEAKAGE, SEPARATE AND INDEPENDENT OF THE COLLECTION SYSTEM PIPES, BY HYDROSTATIC EXFILTRATION TESTING, VACUUM TESTING, OR OTHER METHOD APPROVED BY THE EXECUTIVE DIRECTOR.
(1) HYDROSTATIC TESTING.
(A) THE MAXIMUM LEAKAGE FOR HYDROSTATIC TESTING OR ANY ALTERNATIVE TEST METHODS IS 0.025 GALLONS PER FOOT DIAMETER PER FOOT OF MANHOLE DEPTH PER HOUR.
(B) TO PERFORM A HYDROSTATIC EXFILTRATION TEST, AN OWNER SHALL SEAL ALL WASTEWATER PIPES COMING INTO A MANHOLE WITH AN INTERNAL PIPE PLUG, FILL THE MANHOLE WITH WATER, AND MAINTAIN THE TEST FOR AT LEAST ONE HOUR.
(C) A TEST FOR CONCRETE MANHOLES MAY USE A 24-HOUR WETTING PERIOD BEFORE TESTING TO ALLOW SATURATION OF THE CONCRETE.
(2) VACUUM TESTING.
(A) TO PERFORM A VACUUM TEST, AN OWNER SHALL PLUG ALL LIFT HOLES AND EXTERIOR JOINTS WITH A NON-SHRINK GROUT AND PLUG ALL PIPES ENTERING A MANHOLE.
(B) NO GROUT MUST BE PLACED IN HORIZONTAL JOINTS BEFORE TESTING.
(C) STUB-OUTS, MANHOLE BOOTS, AND PIPE PLUGS MUST BE SECURED TO PREVENT MOVEMENT WHILE A VACUUM IS DRAWN.
(D) AN OWNER SHALL USE A MINIMUM 60 INCH/LB TORQUE WRENCH TO TIGHTEN THE EXTERNAL CLAMPS THAT SECURE A TEST COVER TO THE TOP OF A MANHOLE.
(E) A TEST HEAD MUST BE PLACED AT THE INSIDE OF THE TOP OF A CONE SECTION, AND THE SEAL INFLATED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
(F) THERE MUST BE A VACUUM OF 10 INCHES OF MERCURY INSIDE A MANHOLE TO PERFORM A VALID TEST.
(G) A TEST DOES NOT BEGIN UNTIL AFTER THE VACUUM PUMP IS OFF.
(H) A MANHOLE PASSES THE TEST IF AFTER 20 MINUTES AND WITH ALL VALVES CLOSED, THE VACUUM IS AT LEAST 9.0 INCHES OF MERCURY.

- 17. ALL PRIVATE SERVICE LATERALS MUST BE INSPECTED AND CERTIFIED IN ACCORDANCE WITH 30 TAC §213.5(C)(3)(I). AFTER INSTALLATION OF AND, PRIOR TO COVERING AND CONNECTING A PRIVATE SERVICE LATERAL TO AN EXISTING ORGANIZED SEWAGE COLLECTION SYSTEM, A TEXAS LICENSED PROFESSIONAL ENGINEER, TEXAS REGISTERED SANITARIAN, OR APPROPRIATE CITY

CRITERIA FOR SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS

- I. WHERE A SEWER MAIN CROSSES OVER A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN NINE (9) FEET, ALL PORTIONS OF THE SEWER MAIN WITHIN NINE (9) FEET OF THE WATER LINE SHALL BE CONSTRUCTED USING 160 PSI PRESSURE RATED HDPE AND JOINED WITH EQUALLY PRESSURE RATED PRESSURE RING GASKET CONNECTIONS OR CORROSION PROTECTED MECHANICAL COUPLING DEVICES OF A CAST IRON OR DUCTILE IRON MATERIAL. A SECTION OF 160 PSI PRESSURE RATED PIPE AT LEAST EIGHTEEN (18) FEET IN LENGTH MAY BE CENTERED ON THE WATER MAIN IN LIEU OF PIPE CONNECTION REQUIREMENTS. (NO SEPARATE PAY ITEM).
II. WHERE A SEMI-RIGID OR RIGID SEWER MAIN CROSSES UNDER A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN NINE FEET BUT GREATER THAN TWO FEET, THE INITIAL BACKFILL SHALL BE CEMENT STABILIZED SAND OR MORE BAGS OF CEMENT PER CUBIC YARD OF SAND) FOR ALL SECTIONS OF THE SEWER WITHIN NINE FEET OF THE WATER MAIN.
III. WHERE A SEWER MAIN CROSSES UNDER A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN TWO FEET, THE SEWER MAIN SHALL BE CONSTRUCTED OF HDPE WITH A MINIMUM PRESSURE RATING OF 160 PSI WITHIN NINE FEET OF THE WATER MAIN. SHALL BE PLACED NO CLOSER THAN SIX (6") INCHES BETWEEN TWO FEET. THE INITIAL BACKFILL SHALL BE CEMENT STABILIZED SAND OR MORE BAGS OF CEMENT PER CUBIC YARD OF SAND) FOR ALL SECTIONS OF THE SEWER WITHIN NINE FEET OF THE WATER MAIN.
IV. WHERE A SEWER MAIN PARALLELS A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN NINE FEET, THE SEWER MAIN SHALL BE BELOW THE WATER MAIN. SHALL BE CONSTRUCTED OF HDPE WITH A MINIMUM PRESSURE RATING OF 160 PSI FOR BOTH PIPE AND JOINTS FOR A DISTANCE OF NINE FEET BEYOND THE POINT OF CONFLICT. SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE BETWEEN OUTER DIAMETERS OF TWO FEET AND FOUR FEET BEYOND THAT DISTANCE. SHALL BE JOINED WITH PRESSURE RING GASKET CONNECTIONS OR CORROSION PROTECTED MECHANICAL COUPLING DEVICES OF A CAST IRON OR DUCTILE IRON MATERIAL.
V. SANITARY SEWER MANHOLES SHALL NOT BE INSTALLED ANY CLOSER THAN NINE FEET TO WATER MAINS.

SUPPLEMENTARY NOTES

- 1. THE CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING ALL PERMITS.
2. ALL WORK IN THE 100 YEAR FLOODPLAIN SHALL BE ACCOMPLISHED UNDER AN APPROVED FLOODPLAIN PERMIT.
3. CONTRACTOR SHALL PROTECT OR REMOVE AND REPLACE ALL TRAFFIC SIGNS (NSPI).
4. CONTRACTOR SHALL PROTECT OR REMOVE AND REPLACE ALL MAILBOXES (NSPI).
5. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER IN ADVANCE OF ANY WORK IN THE OWNERS' PROPERTY.

STORM WATER PROTECTION AND EROSION CONTROL NOTES

- 1. CONTRACTOR SHALL PROVIDE HIS/HER OWN STORM WATER POLLUTION PREVENTION PLAN (SWPP).
2. CONTRACTOR SHALL INSTALL STORM WATER POLLUTION PREVENTION STRUCTURES INCLUDING BUT NOT LIMITED TO, SILT FENCING AND/OR ROCK BERMS IN ALL AREAS TO BE IMPACTED BY CURRENT AND ONGOING CONSTRUCTION AND MAINTAIN SUCH STRUCTURES UNTIL SUITABLE GROUND COVER/VEGETATION IS ACCEPTED. STORM WATER POLLUTION PREVENTION STRUCTURES SHALL BE CONSTRUCTED WITHIN THE COUNTY RIGHT-OF-WAY AND WATER LINE EASEMENTS. ANY FEATURES ON THE PLANS SHOWN OUTSIDE THESE AREAS ARE SHOWN FOR VISUAL CLARITY ONLY.
3. THE LOCATION OF ANY BEST MANAGEMENT PRACTICES (B.M.P.'S) SUCH AS SILT FENCING, ROCK BERMS, STABILIZED CONSTRUCTION ENTRANCE/EXIT, ETC. THAT MAY BE SHOWN ON THESE PLANS ARE SUBJECT TO FIELD VERIFICATION. CONTRACTOR SHALL ADJUST THE LOCATIONS OF B.M.P.'S TO BEST ACCOMMODATE THE CONDITIONS AND TOPOGRAPHY ENCOUNTERED DURING CONSTRUCTION. QUESTIONS REGARDING THE PLACEMENT AND/OR CHANGES CONCERNING B.M.P.'S SHALL BE REFERRED TO THE OWNER AND THE COUNTY. THE CONTRACTOR IS TO ENSURE THAT SEDIMENTATION AND EROSION WILL BE CONTAINABLE WITH THE PROJECT WORK AREAS AND KEPT OFF ROADWAYS AND ADJACENT PROPERTIES AND OUT OF DRAINAGE CHANNELS AND WATER COURSES.

HAULING AND STORAGE

- HAULING AND/OR TEMPORARY STORAGE OF EQUIPMENT AND MATERIALS MAY BE NECESSARY, INCLUDING EXCAVATED MATERIAL AND SPILLS. CONTRACTOR SHALL INCLUDE IN HIS BID PRICE ALL COSTS ASSOCIATED WITH HAULING AND OFF-SITE STORAGE OF ALL MATERIALS AND/OR EQUIPMENT. ALSO REFER TO THE PROJECT SPECIFICATIONS.

EXISTING IMPROVEMENTS

- ALL EXISTING IMPROVEMENTS WITHIN THE PROJECT AREA, WHICH ARE NOT COVERED UNDER THE UNIT PRICE BID PROPOSAL, SHALL BE PROTECTED OR REMOVED AND REPLACED TO EXISTING CONDITION OR BETTER AT NO ADDITIONAL COST TO THE OWNER.

TREE PROTECTION NOTES

- 1. CONTRACTOR TO PROTECT ALL TREES WHEREVER POSSIBLE. DAMAGE TO TREES IDENTIFIED TO BE PROTECTED WILL BE MITIGATED AT THE CONTRACTOR'S SOLE EXPENSE. ALSO, ALL WORK IN PUBLIC RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH THE CONTROLLING ENTITIES' STANDARDS, SPECIFICATIONS AND PERMIT REQUIREMENTS.
2. PROTECT EXISTING TREES SIX INCH (6") DIAMETER AND LARGER. ALL TREES TO BE PRESERVED AS PART OF THE PROJECT SHALL BE PROTECTED AGAINST INJURY OR DAMAGE INCLUDING CUTTING, SOIL COMPACTION, BREAKING OR SKINNING OF ROOTS, TRUNKS, OR BRANCHES DURING CONSTRUCTION OPERATIONS BY FENCING AS DESCRIBED BELOW. THE TREE PROTECTION SHALL BE PLACED BEFORE ANY EXCAVATION OR GRADING IS BEGUN AND MAINTAINED FOR THE DURATION OF THE CONSTRUCTION WORK. PROTECTION WILL ENCOMPASS THE ROOT PROTECTION ZONE WHICH WILL BE AT MINIMUM ONE FOOT (1.0') RADIAL PER INCH DIAMETER OF THE TREE TRUNK AT 4.5' ABOVE GROUND. NO MATERIAL SHALL BE STORED OR CONSTRUCTION OPERATION SHALL BE CARRIED ON WITHIN THE TREE PROTECTION FENCING UNLESS AUTHORIZED BY THE OWNER. THE PROTECTION SHALL REMAIN UNTIL ALL WORK IS COMPLETED.
3. NO CONSTRUCTION ACTIVITIES SHALL BE PERFORMED WITHIN 5' FROM THE TRUNK OF A TREE. TRENCHING OR SHORING SHALL BE PERFORMED WITHIN A FENCING OF A ROOT PROTECTION ZONE. THE ROOT PROTECTION ZONE IS CALCULATED AS A RADIUS FROM THE TREE TRUNK EQUAL TO ONE FOOT PER DIAMETER INCH OF THE TREE.
4. THIS PROJECT IS SUBJECT TO REGULATIONS ESTABLISHED BY THE CITY OF SAN ANTONIO TREE ORDINANCE.

TEMPORARY LIVESTOCK CONTROL

- WHEN WORKING IN AN AREA WITH LIVESTOCK, THE CONTRACTOR SHALL INSTALL AND MAINTAIN (AT CONTRACTOR'S EXPENSE) THE NECESSARY TEMPORARY FENCING TO KEEP THE LIVESTOCK FROM EXITING THE AREA. ANY ESCAPED LIVESTOCK WILL BE CAPTURED AND RETURNED TO THE AREA AT THE CONTRACTOR'S EXPENSE.

CONTRACTOR STAKING NOTE

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL CONSTRUCTION STAKING AND CUT STAKES NECESSARY FOR THE CONSTRUCTION OF THE WATER MAIN AND ALL ASSOCIATED APPURTENANCES. ALL CONSTRUCTION SURVEY, VERIFICATION AND CONSTRUCTION STAKING SHALL BE PERFORMED BY OR UNDER THE SUPERVISION OF A TEXAS REGISTERED PROFESSIONAL LAND SURVEYOR. THE ADDITIONAL ENGINEERING COST PROVIDED AT NO ADDITIONAL COST. PROVIDE THE STAKING OF THE PROJECT'S HORIZONTAL AND VERTICAL CONTROL (MINIMUM OF THREE CONTROL POINTS) FOR THE CONTRACTOR. ALL COORDINATES ARE DISPLAYED IN STATE PLANE SURFACE VALUES.

DATE:
NO.
REVISION:
Professional Engineer Seal for CARA C. TACKETT, No. 89491, State of Texas.

PAPE-DAWSON ENGINEERS
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VERAMENDI SANITARY SEWER S1-S6
NEW BRAUNFELS, TEXAS
GENERAL NOTES

JOB NO. 7620-56
DATE JULY 2019
DESIGNER RM
CHECKED JD DRAWN BS
SHEET C0.01

Notes: Rev. 06/2019, 2/14/2019, 2/14/2019, 2/1

CONSTRUCTION PLAN NOTES

Revised 01/2019

These notes must appear on the cover and/or "notes" sheet of all subdivision construction plans and on commercial plans where applicable:

If construction has not commenced within one-year of City approval for construction inspection, that approval is no longer valid.

The most current editions of the City of San Antonio Standard Specifications and the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges shall be followed for all construction except as amended by the City of New Braunfels Standard Details.

All responsibility for the adequacy of these plans remains with the engineer of record. In accepting these plans, the City of New Braunfels must rely upon the adequacy of the work of the engineer of record.

Prior to the start of construction, the contractor shall contact the City of New Braunfels to schedule a preconstruction meeting.

- For Public Infrastructure Permit (SC) or Grading Permit (GP) Projects:
• For inspections, you must call before 12:00 p.m., 48 hours prior to your inspection request.
• Each inspection will be allotted 1 hour unless you request for more time.
• Once your request has been accepted, you will receive a call from the City of New Braunfels Inspector.

- For Commercial Permit (CP) Projects:
• All inspections are to be called in at 830-221-4068 or,
• Faxed in at 830-608-2117 or,
• E-mailed at inspections@nbtexas.org.

It is the Contractor's responsibility to see that all temporary and permanent traffic control devices are properly installed and maintained in accordance with the plans and latest edition of the Texas Manual on Uniform Traffic Control Devices. If, in the opinion of the engineering representative and the construction inspector, the barricades and signs do not conform to established standards or are incorrectly placed or are insufficient in quantity to protect the general public, the construction inspector shall have the option to stop operations until such time as the conditions are corrected. If the need arises, additional temporary traffic control devices may be ordered by the Engineering representative at the Contractor's expense.

A TxDOT Type II B-B blue reflective raised pavement marker shall be installed in the center of the roadway adjacent to all fire hydrants. In locations where hydrants are situated on corners, blue reflective raised pavement markers shall be installed on both approaches which front the hydrant. The raised pavement marker shall meet TxDOT material, epoxy and adhesive specifications.

CHANNEL MAINTENANCE PLAN

The following are guidelines for the overall maintenance of the channel system and drainage easement by the designated maintenance entity as defined by the executed drainage agreement. The designated maintenance entity will be responsible for the operation, maintenance, and repair of the system and easement to ensure that it operates as designed.

- Inspections. The channel should be inspected to assure proper operation at least 4 times annually. One of these inspections should occur during or immediately following wet weather.
Moving. The side slopes and bottom of the channel that are covered with grass must be mowed regularly to discourage woody growth and control weeds. Grass areas in and around the channel must be mowed at least four times annually to limit vegetation height to 12 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas. When mowing is performed, a mulching mower should be used, or grass clippings should be caught and removed. Vegetation shall be maintained so as to match the intent of the original design of the channel and preserve the flow conveyance capacity. Any woody vegetation which becomes established shall be periodically removed or mulched to ground level. Any removal of brush which results in disturbance of established grades shall be repaired/re-graded and revegetated.
Debris, Litter, and Obstruction Removal. Debris and litter may accumulate in the channel and/or near the drop structure and outfall and should be removed during regular mowing operations and inspections or after large rainfall events. Any other obstructions that impede flow as intended by the original design shall be removed in a timely manner.
Erosion Control. The channel side slopes and embankment may periodically suffer from slumping and erosion. Regrading and re-establishment of vegetation may be required to correct the problems. Vegetation should be re-established to the original design standards. Inspection of sediment deposits along the length of the channel should occur during the stated intervals. All sediment deposits exceeding 12" in depth or which are preventing positive drainage should be removed from the channel at least once annually. All sediment should be removed and disposed of properly.

Groundwater

It shall be the responsibility of the developer, contractor, subcontractors, builders, Geo-technical engineer, and project engineer to immediately notify the Office of the City Engineer and project engineer if the presence of groundwater within the site is evident. Upon notification the project engineer shall respond within two (2) business days upon receipt of the mitigation plan. All construction activity, impacted by the discovery of groundwater, shall be suspended until the City Engineer grants a written approval of the groundwater mitigation plan.

Record Drawings

As per Platting Ordinance Section 118-38m.: When all of the improvements are found to be constructed and completed in accordance with the approved plans and specifications and with the City's standards, and upon receipt of one set of "Record Drawing" plans, and a digital copy of all plans (PDF copy) the City Engineer shall accept such improvements for the City of New Braunfels, subject to the guaranty of material and workmanship provisions in this Section.

Construction Note

Engineer of Record is responsible to ensure that erosion control measures and stormwater control sufficient to mitigate off site impacts are in place at all stages of construction.

Drainage Note

Drainage improvements sufficient to mitigate the impact of construction shall be installed prior to adding impervious cover.

Finished Floor Elevations

The elevation of the lowest floor shall be at least 10 inches above the finished grade of the surrounding ground, which shall be sloped in a fashion so as to direct stormwater away from the structure. Properties adjacent to stormwater conveyance structures must have floor slab elevation or bottom of floor joists a minimum of one foot above the 100-year water flow elevation in the structure. Driveways serving houses on the downhill side of the street shall have a properly sized cross slope preventing runoff from entering the garage.

Soils Testing

Proctors shall be sampled from on-site material (on-site is defined as limits of construction for this plan set) and a copy of the proctor results shall be delivered to the City of New Braunfels Street Inspector prior to any density tests.

Roadway

All roadway compaction tests shall be the responsibility of the developer's Geotechnical Engineer. Flexible base or fill/embankment material shall be placed in uniform layers not to exceed eight inches (8") loose. The required density for the fill/embankment material shall meet the requirements of TxDOT's Specification Item 132. The required density for the flexible base material shall meet the requirements of TxDOT's Specification Item 247. Each layer of material, inclusive of subgrade, shall be compacted as specified and tested for density and moisture in accordance with Test Methods TEX-113-E, TEX-114-E, TEX-115-E. The number and location of required tests shall be determined by the Geotechnical Engineer and approved by the City of New Braunfels Street Inspector. At a minimum, tests shall be taken every 200 LF for each lift. Upon completion of testing, the Geotechnical Engineer will provide the City of New Braunfels Street Inspector with all testing documentation and a certification stating that the placement of flexible

The designated "Responsible party" is responsible to insure that erosion control measures and stormwater control sufficient to mitigate off site impacts are in place at all stages of construction.

DRAINAGE MAINTENANCE PLAN

The storm drain pipe shall be checked for accumulation of silt, debris or other obstructions which could block flow. When silt deposits have accumulated to the point of reducing the drain capacity then the pipes can be flushed with a high-pressure water flushing process. Soil accumulations, vegetative overgrowth and other blockages should be cleared from the pipe discharge point. Erosion at the point of discharge shall be monitored. If erosion occurs, the addition of rock rubble to disperse the flow should be accomplished.

base, and fill material, and subgrade, has been completed in accordance with the plans. Additional density tests may be requested by the City of New Braunfels Inspector.

Item 340

Asphaltic concrete pavement shall be the type of hot mix asphalt as defined in TxDOT's standard specifications for current TxDOT Standard Specifications for Construction of Highways, Street and Bridges.

The City of New Braunfels will not accept the use of Recycled Asphalt Pavement (RAP) or Recycled Asphalt Shingles (RAS) in asphalt mixtures for new roadways. Any debris inclusions within new asphalt pavements will result in asphalt removal and replacement from curb to curb for limits to be determined by the City of New Braunfels.

The asphaltic concrete pavement surface course shall be plant mixed, hot laid type "D" meeting the specification requirements of TxDOT Item 340. The asphaltic concrete pavement sub-surface courses shall be plant mixed, hot laid type "B" meeting the specification requirements of TxDOT Item 340. The mixture shall be designed per the design requirements specified in TxDOT Item 340 and shall be compacted to between 91 and 95 percent of the maximum theoretical density as determined by TxDOT test method TEX-227-F. Place the mixture when the roadway surface temperature is at or above 60°F. Complete all compaction operations before the pavement temperature drops below 160°F. The asphalt cement content by percent of total mixture weight shall fall within a tolerance of ±0.5 percent from a specific mix design.

Utility Trench Compaction (added to the construction plans on All Utility Plan Sheets).

All utility trench compaction tests within the street pavement/sidewalk section shall be the responsibility of the developer's Geotechnical Engineer. Fill material shall be placed in uniform layers not to exceed twelve inches (12") loose. Determine the maximum lift thickness based on the ability of the compacting operation and equipment used to meet the required density. Each layer of material shall be compacted to a minimum 95% density and tested for density and moisture in accordance with Test Methods TEX-113-E, TEX-114-E, TEX-115-E. The number and location of required tests shall be determined by the Geotechnical Engineer and approved by the City of New Braunfels Street Inspector. At a minimum, tests shall be taken every 200 LF for each lift and every other service line. Upon completion of testing the Geotechnical Engineer shall provide the City of New Braunfels Street Inspector with all testing documentation and a certification stating that the placement of fill material has been completed in accordance with the plans. Additional density tests may be requested by the City of New Braunfels Inspector.

Curb Cut Due to Construction of New Right-Of-Way Construction

- (Indicate the 2 Options on the construction plans).
1. Sawcut existing street and match to new construction.
2. Sawcut existing curb to tie into existing construction.

Construction Stabilized Entrance

Sawcut curb for construction entrance.

Stabilized construction area shall be constructed of 3"x5" rock to be placed a minimum length of 25-ft. and maintained so that construction debris does not fall within the city right-of-way. Right-of-way must be cleared from mud, rocks, etc. at all times.

(Notes to Be Placed on All WW Plan & Detail Sheets)

Ensure all driveway approaches are built in general accordance with A.D.A. specifications.

No valves, hydrants, etc. shall be constructed within curbs, sidewalks, or driveways.

Signage and Pavement Marking Plan Notes

The Contractor shall furnish and install all regulatory and warning signs, streets name signs and sign mounts in accordance with approved engineering plans. The City will inspect all signs at final inspection.

The Contractor shall install all pavement markings in accordance with approved engineering plans. The Contractor shall notify the City at least twenty-four (24) hours prior to the installation of all sealer and final markings. The City will inspect all markings at final application.

Seeding and Establishment of Vegetation within Earthen Channels, Stormwater Basins and Disturbed Areas

Seeding for the purpose of establishing vegetation within constructed earthen channels, basins and disturbed areas shall be conducted in accordance with Item 164 (Seeding for Erosion Control) of TxDOT's Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges manual. Only seed types and mixes specified for the San Antonio District (District 15) in Tables 1 and 2 under Item 164 shall be utilized. During the Cool Season (Sept 1-Nov 30), Cereal Rye and seed species specified for the San Antonio District in Table 3 may be used. For Cool Season seeding applications, cool season seed mixes shall be used in conjunction with seed mixes for the San Antonio District as specified in Table 1 and 2 under Item 164.

It may be deemed necessary to incorporate topsoil and soil amendments (i.e. compost/ fertilizer) into existing soil in order to facilitate vegetation growth. Topsoil, compost and fertilizer additions shall be conducted according to Items 160, 161 and 166 of TxDOT's Standard Specifications manual, respectively.

Watering may also be necessary to facilitate and expedite the sprouting and growth of vegetation. Item 168 of TxDOT's Standard Specifications manual shall be adhered to for vegetative watering.

If extended drought conditions exist that hinder or prohibit the growth and establishment of vegetation, the contract/ developer shall provide a plan to the City of New Braunfels describing the measures that will be taken to stabilize earthen drainage infrastructure until a time when growing conditions become more favorable.

PROPOSED CONSTRUCTION SEQUENCE

(THE FOLLOWING ITEMS MAY OCCUR SIMULTANEOUSLY OR OUT OF SEQUENCE INDICATED. ALL SEQUENCES SUBJECT TO CHANGE)

- 1. INSTALL TEMPORARY STORMWATER EROSION CONTROL MEASURES IN AFFECTED CONSTRUCTION AREAS AND STABILIZED CONSTRUCTION ENTRANCES/EXITS.
2. INSTALL TREE PRESERVATION MEASURES, IF REQUIRED.
3. CONSTRUCT WASTEWATER PIPELINE.
4. ESTABLISH SITE STABILIZATION.
5. REMOVE ALL TEMPORARY STORMWATER EROSION CONTROL MEASURES.

Table with columns: NO., REVISION, DATE, CREATED NEW SHEET WITH, NEW CONSTRUCTION NOTES.



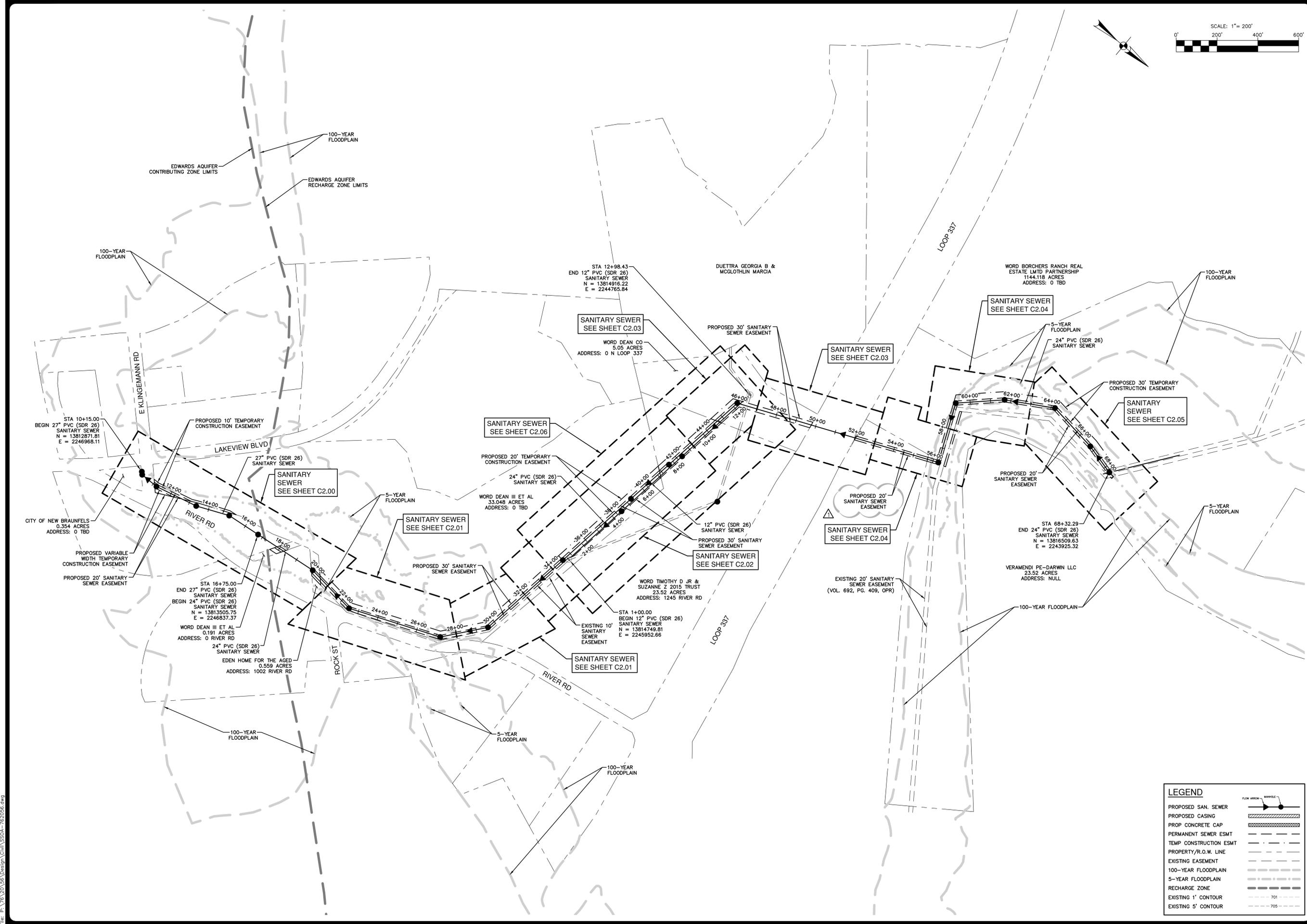
PAPE-DAWSON ENGINEERS logo and address: NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS

VERAMENDI SANITARY SEWER S1-S6 NEW BRAUNFELS, TEXAS CONSTRUCTION NOTES

Table with project details: JOB NO. 7620-56, DATE JULY 2019, DESIGNER RM, CHECKED JD DRAWN BS, SHEET C0.02

Notes: Rev. 31, 01/09/2019, 2:49pm, User: ID: BSSmith, File: P:\18\182058\Drawings\Civil\SSW1-F-182058.dwg

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NO.	REVISION	DATE
1	REVISED EASEMENT WIDTH	07/30/20



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 NEW BRAUNFELS 1501 ANTONIO | AUSTIN 11000 N. BRUNNEN | FORT WORTH 1100 WORTH | DALLAS 1675 INDEPENDENCE DR. STE 102 | NEW BRAUNFELS, TX 78132 | 210.375.9000
 TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION #470

VERAMENDI SANITARY SEWER S1-S6
 NEW BRAUNFELS, TEXAS
 OVERALL SEWER LAYOUT

LEGEND	
PROPOSED SAN. SEWER	
PROPOSED CASING	
PROP CONCRETE CAP	
PERMANENT SEWER ESMT	
TEMP CONSTRUCTION ESMT	
PROPERTY/R.O.W. LINE	
EXISTING EASEMENT	
100-YEAR FLOODPLAIN	
5-YEAR FLOODPLAIN	
RECHARGE ZONE	
EXISTING 1' CONTOUR	
EXISTING 5' CONTOUR	

JOB NO.	7620-56
DATE	JULY 2019
DESIGNER	RM
CHECKED	JD DRAWN BS
SHEET	C1.00

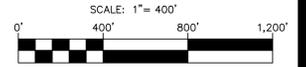
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LEGEND

PROPOSED SAN. SEWER 

PROPERTY/R.O.W. LINE 

BENCHMARK 



POINTS				
POINT #	DESCRIPTION	ELEVATION	NORTHING	EASTING
1	SITE BENCH MARK - (#1)	815.06	13812206.87	2238164.71
2094	SITE BENCH MARK - (C-16)	768.18	13814783.69	2242081.27
6007	SITE BENCH MARK - (6007)	753.47	13815126.79	2240121.02
10002	SITE BENCH MARK - (#2)	804.70	13813291.99	2239629.62
10003	SITE BENCH MARK - (TXDOT)	793.43	13813966.67	2240543.18



NO.	REVISION	DATE



Cara C. Tackett
07/24/19

PAPE-DAWSON ENGINEERS

NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
 1672 INDEPENDENCE DR. STE 102 | NEW BRAUNFELS, TX 78132 | 210.375.9000
 TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION #470

VERAMENDI SANITARY SEWER S1-S6
 NEW BRAUNFELS, TEXAS
 BENCHMARK CONTROL SHEET

JOB NO.	7620-56
DATE	JULY 2019
DESIGNER	RM
CHECKED	JD DRAWN BS
SHEET	C1.01

Notes: Dec. 09, 2018, 2:15pm, User ID: p5sutt
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TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH, AT A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATION. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

CAUTION!!!

1. CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITING TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESTS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT. CONTRACTOR TO EXERCISE EXTREME CAUTION WHEN WORKING UNDER AND/OR AROUND OVERHEAD ELECTRIC LINES. CONTRACTOR SHALL COORDINATE WITH ELECTRIC COMPANY TO ESTABLISH THE MAXIMUM WORKING HEIGHT FROM GROUND ELEVATION. COORDINATE ALL WORK WITH ELECTRIC COMPANY.

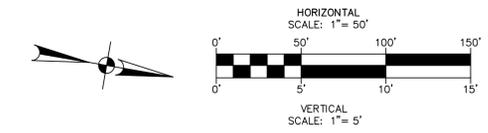
CITY OF NEW BRAUNFELS UTILITY NOTES

1. ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEO-TECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") THICK. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEO-TECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 100LF FOR EACH LIFT. UPON COMPLETION OF TESTING THE GEO-TECHNICAL ENGINEER SHALL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.

2. ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS.

3. THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5- FEET IN DEPTH. DEEP TRENCHES POSE COMPACTION TESTING AND CONSTRUCTION CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY INSTALLATION.

4. ALL CONSTRUCTION METHODS, TESTING, AND ACCEPTANCE REQUIREMENTS, INCLUDING MATERIALS SHALL COMPLY WITH NBU CONSTRUCTION SPECIFICATIONS.



SANITARY SEWER NOTES

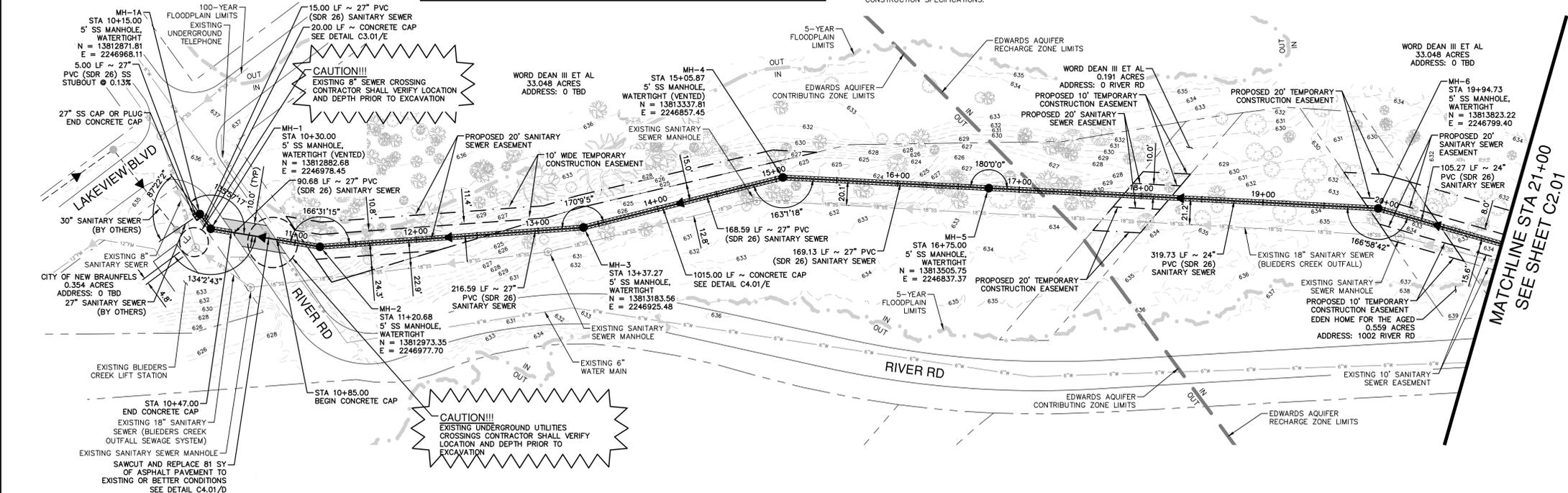
- CONTRACTOR TO FIELD-VERIFY EXISTING SANITARY SEWER ELEVATIONS PRIOR TO CONSTRUCTION.
- ALL MANHOLE COVERS SHALL BE SECURED WITH FOUR (4) STAINLESS STEEL (SS304 OR BETTER) BY-TITS. BOLTS THAT ARE DIRECTLY THREADED INTO THE UNDERLYING CAST-IRON FRAME SHALL BE THOROUGHLY COATED WITH NIKAL JET LUBE OR APPROVED ALTERNATE BEFORE INSERTION TO AVOID SEIZING FROM DISSIMILAR METALS.
- THE UNDERSIDE OF EACH MANHOLE COVER SHALL BE EQUIPPED WITH A CONTINUOUS (ONE-PIECE) VULCANIZED "I-SHAPED" GASKET FOR PERIMETER LEAKAGE SEALING. THE GASKET SHALL BE OF NITRILE, NEOPRENE, OR EPDM CONSTRUCTION AND PRE-INSERTED INTO A PERIMETER RETAINER SCOT BY THE MANUFACTURER. FIELD REPAIRS OF A DAMAGED GASKET SHALL NOT BE ATTEMPTED AND ARE NOT ALLOWED.
- ALL SANITARY SEWER MANHOLE MATERIAL AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH 30 TCEQ, CHAPTER 217.

LEGEND

PROPOSED SAN. SEWER	
PROP CONCRETE CAP	
PERMANENT SEWER ESMT	
TEMP CONSTRUCTION ESMT	
PROPERTY/R.O.W. LINE	
EXISTING EASEMENT	
EXISTING SEWER	
EXISTING WATER	
OVERHEAD ELECTRIC	
UNDERGROUND TELEPHONE	
100-YEAR FLOODPLAIN	
5-YEAR FLOODPLAIN	
RECHARGE ZONE	
EXISTING 1' CONTOUR	
EXISTING 5' CONTOUR	

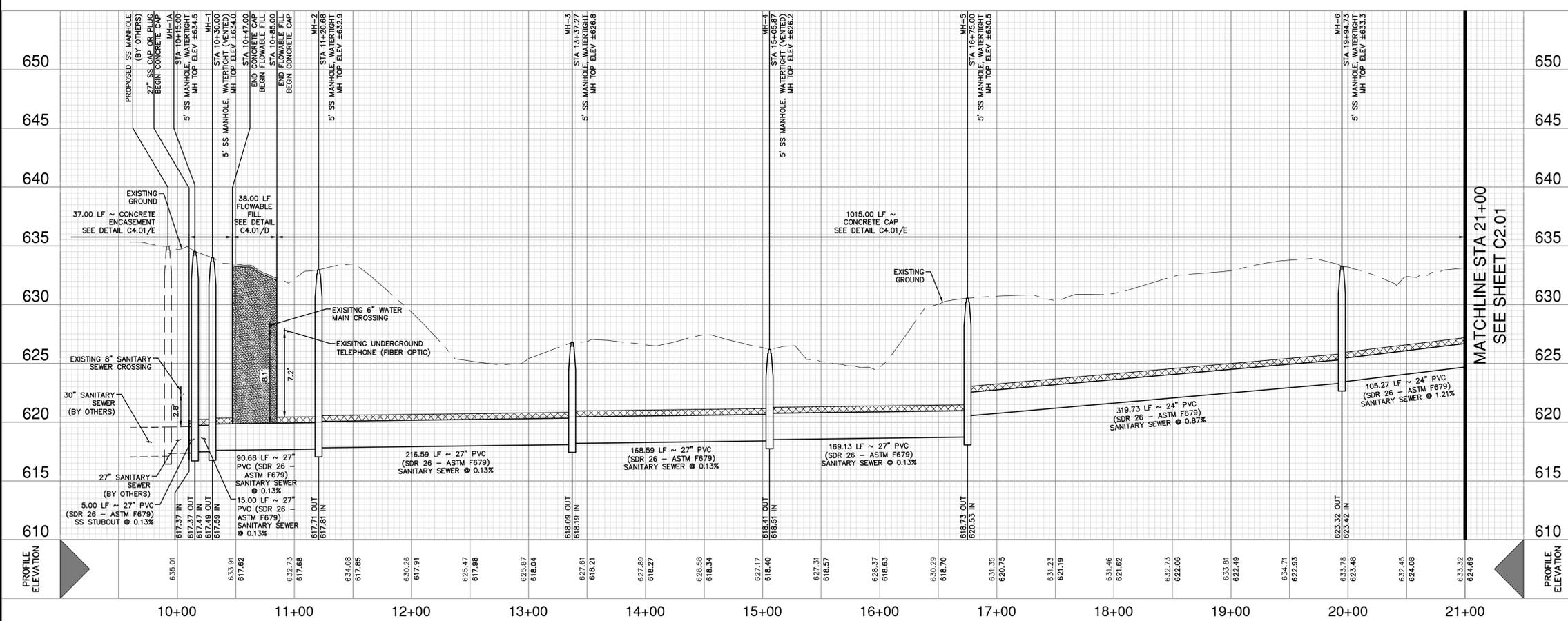
SHEET TOTALS

ITEM	UNIT	TOTAL
27" PVC (SDR 26) SANITARY SEWER (OPEN CUT)	LF	665
24" PVC (SDR 26) SANITARY SEWER (OPEN CUT)	LF	425
5' SS MANHOLES, WATERTIGHT	EA	5
5' SS MANHOLE, WATERTIGHT (VENTED)	EA	2
27" SS CAP OR PLUG	EA	1
CONCRETE CAP	LF	1,052
FLOWABLE FILL	LF	38
SAWCUT AND REPLACE ASPHALT PAVEMENT	SY	81



**27" PVC (SDR 26) SANITARY SEWER
(STA 10+15 TO STA 16+75)**

**24" PVC (SDR 26) SANITARY SEWER
(STA 16+75 TO STA 21+00)**



MATCHLINE STA 21+00
SEE SHEET C2.01

DATE	
NO.	
REVISION	



PAPE-DAWSON ENGINEERS
 NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
 1675 INDEPENDENCE DR. STE 102 | NEW BRAUNFELS, TX 78132 | 210.375.9000
 TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION #470

VERAMENDI SANITARY SEWER S1-S6
 NEW BRAUNFELS, TEXAS
 SANITARY SEWER PLAN AND PROFILE SHEET
 STA 10+10 TO STA 21+00

JOB NO.	7620-56
DATE	JULY 2019
DESIGNER	RM
CHECKED	JD
DRAWN	BS
SHEET	C2.00

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TRENCH EXCAVATION SAFETY PROTECTION

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CAUTION!!!

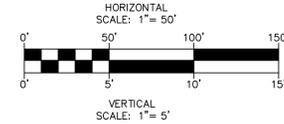
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NOTE

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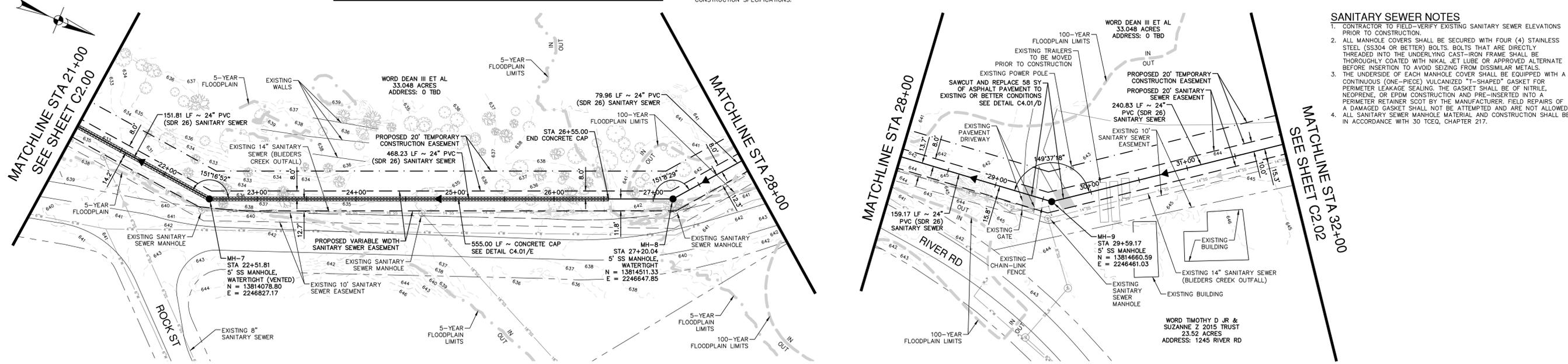
SANITARY SEWER NOTES

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DATE	NO.	REVISION



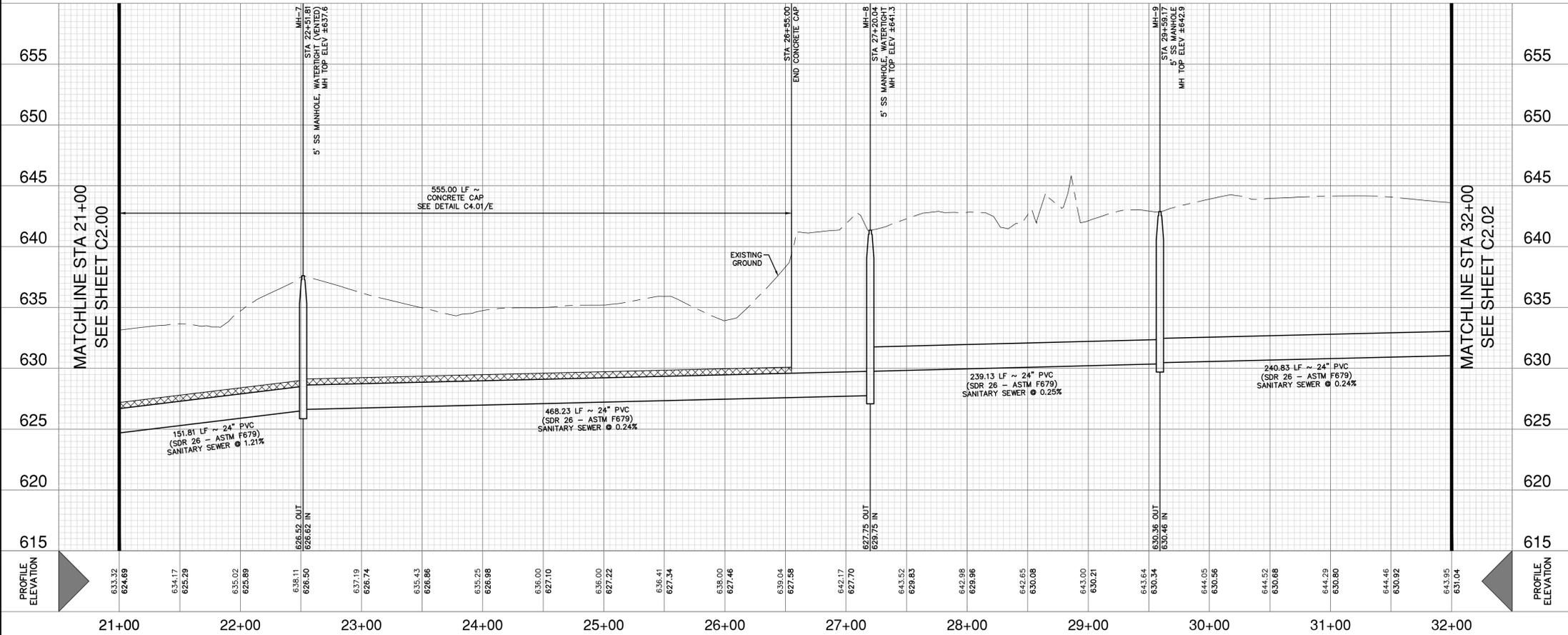
PAPE-DAWSON ENGINEERS
 NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
 1675 INDEPENDENCE DR. STE 102 | NEW BRAUNFELS, TX 78132 | 210.375.9000
 TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION #470



**24" PVC (SDR 26) SANITARY SEWER
 (STA 21+00 TO STA 32+00)**

SHEET TOTALS		
ITEM	UNIT	TOTAL
24" PVC (SDR 26) SANITARY SEWER (OPEN CUT)	LF	1,100
5" SS MANHOLES, STANDARD	EA	1
5" SS MANHOLES, WATER TIGHT	EA	1
5" SS MANHOLES, WATER TIGHT (VENTED)	EA	1
CONCRETE CAP	LF	555

LEGEND	
PROPOSED SAN. SEWER	
PROP CONCRETE CAP	
PERMANENT SEWER ESMT	
TEMP CONSTRUCTION ESMT	
PROPERTY/R.O.W. LINE	
EXISTING EASEMENT	
EXISTING SEWER	
EXISTING WATER	
100-YEAR FLOODPLAIN	
5-YEAR FLOODPLAIN	
EXISTING 1' CONTOUR	
EXISTING 5' CONTOUR	



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VERAMENDI SANITARY SEWER S1-S6
 NEW BRAUNFELS, TEXAS
SANITARY SEWER PLAN AND PROFILE SHEET
 STA 21+00 TO STA 32+00

JOB NO.	7620-56
DATE	JULY 2019
DESIGNER	RM
CHECKED	JD
DRAWN	BS
SHEET	C2.01

TRENCH EXCAVATION SAFETY PROTECTION

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CAUTION!!!

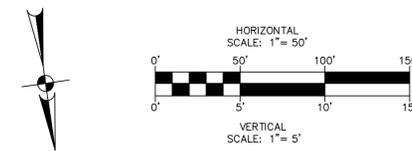
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NOTE

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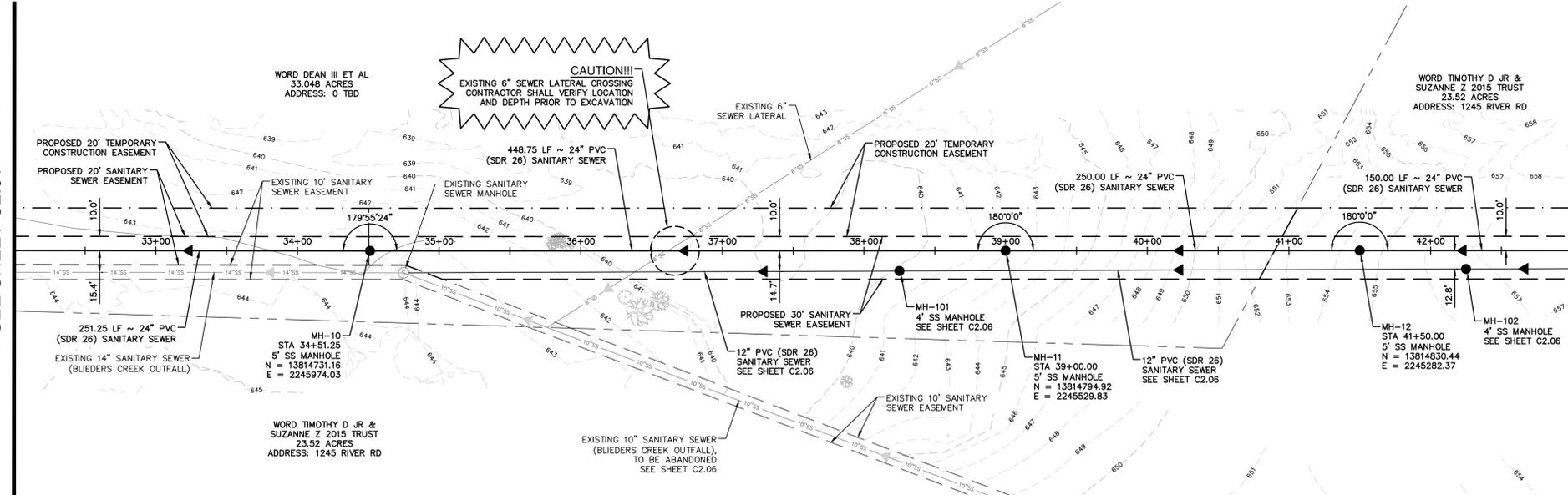


SANITARY SEWER NOTES

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MATCHLINE STA 32+00
SEE SHEET C2.01

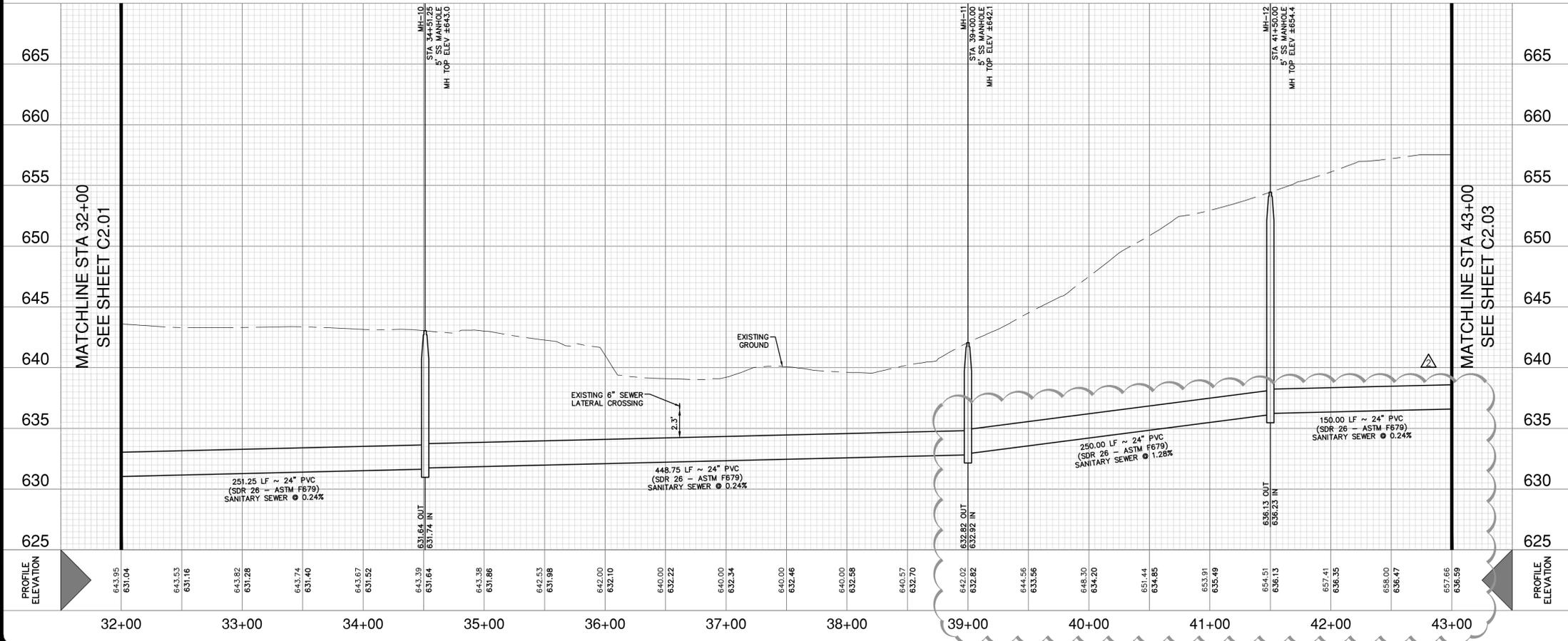
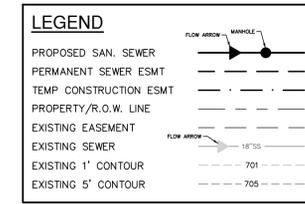
MATCHLINE STA 43+00
SEE SHEET C2.03



**24" PVC (SDR 26) SANITARY SEWER
(STA 32+00 TO STA 43+00)**



SHEET TOTALS		
ITEM	UNIT	TOTAL
24" PVC (SDR 26) SANITARY SEWER (OPEN CUT)	LF	1,100
5" SS MANHOLES, STANDARD	EA	3



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NO.	REVISION	DATE
1	REVISED PROFILE DEPTHS	02/28/20
2	VERTICAL REALIGNMENT	09/01/20



PAPE-DAWSON ENGINEERS
 NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
 1675 INDEPENDENCE DR. STE 102 | NEW BRAUNFELS, TX 78132 | 210.735.9000
 TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION #470

VERAMENDI SANITARY SEWER S1-S6
 NEW BRAUNFELS, TEXAS
 SANITARY SEWER PLAN AND PROFILE SHEET
 STA 32+00 TO STA 43+00

JOB NO.	7620-56
DATE	JULY 2019
DESIGNER	RM
CHECKED	JD
DRAWN	BS
SHEET	C2.02

TRENCH EXCAVATION SAFETY PROTECTION

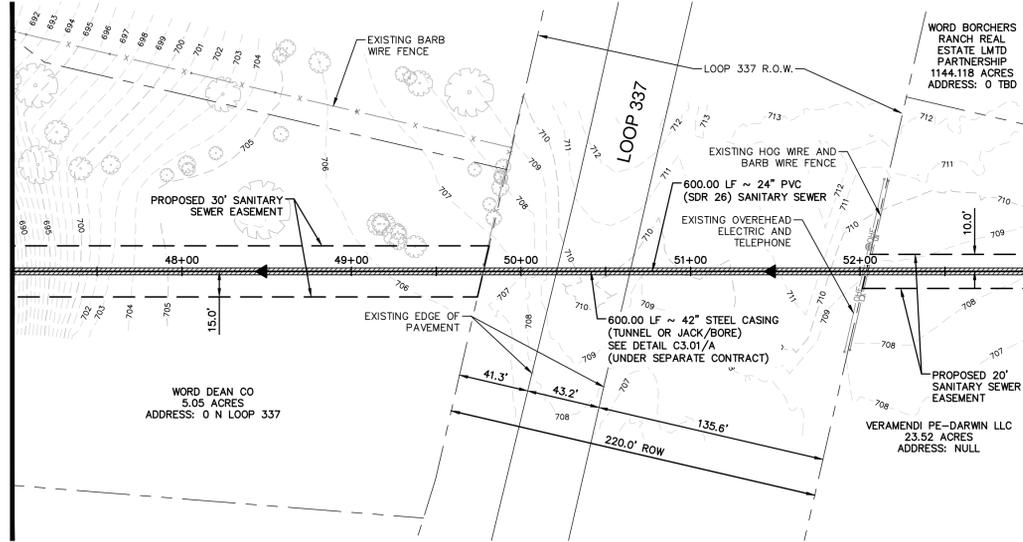
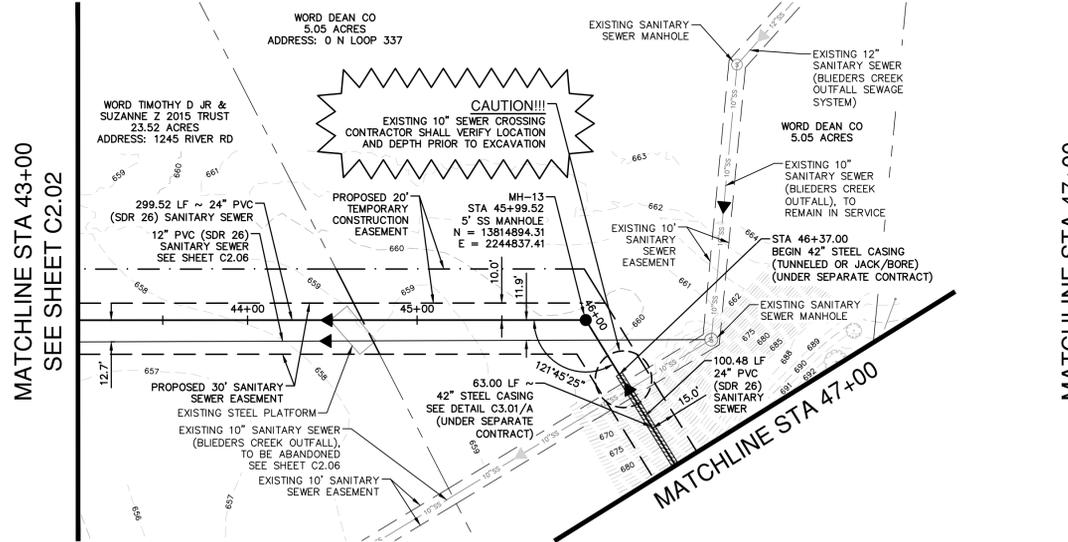
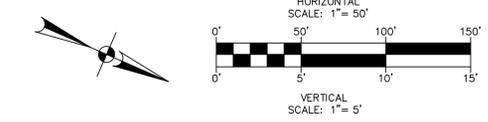
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CAUTION!!!

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CITY OF NEW BRAUNFELS UTILITY NOTES

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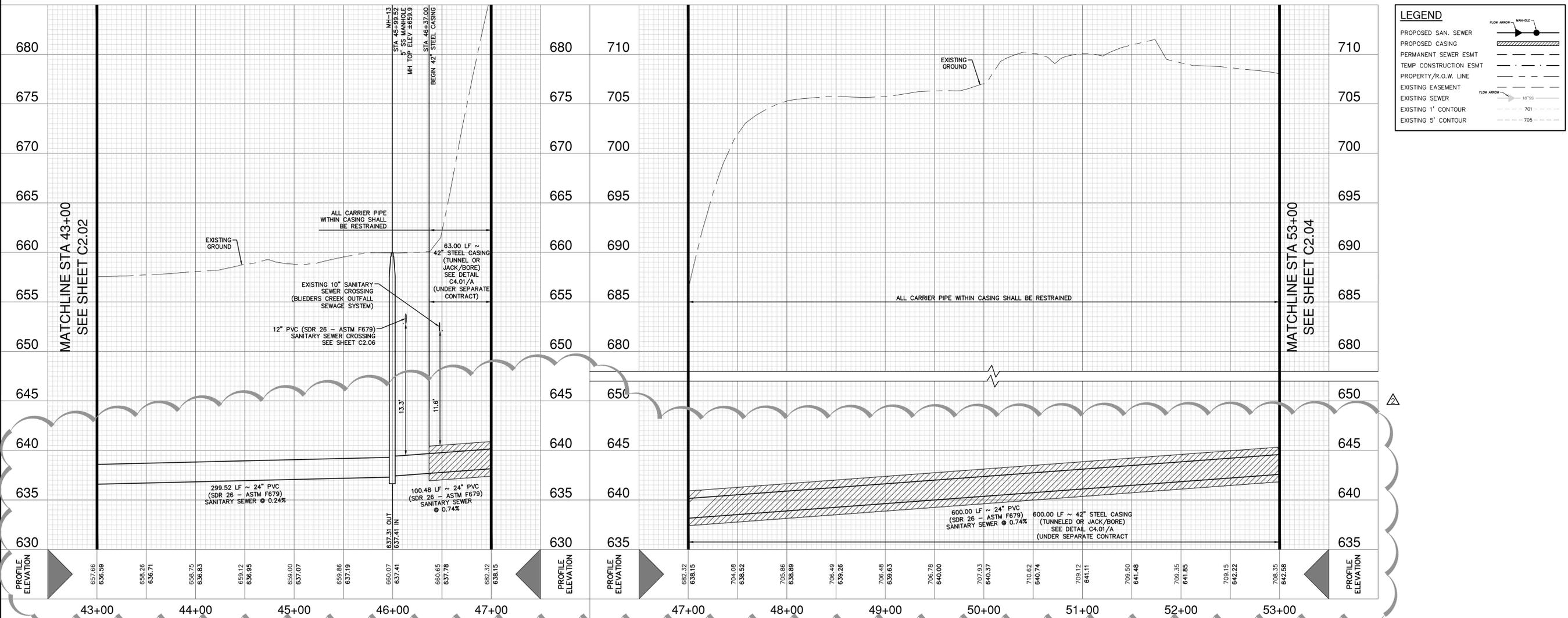
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SHEET TOTALS

ITEM	UNIT	TOTAL
24" PVC (SDR 26) SANITARY SEWER (OPEN CUT)	LF	337
24" PVC (SDR 26) SANITARY SEWER (IN CASING)	LF	663
42" STEEL CASING	LF	663
5' SS MANHOLES, STANDARD	EA	1

24" PVC (SDR 26) SANITARY SEWER (STA 43+00 TO STA 53+00)



LEGEND

- PROPOSED SAN. SEWER
- PROPOSED CASING
- PERMANENT SEWER ESMT
- TEMP CONSTRUCTION ESMT
- PROPERTY/R.O.W. LINE
- EXISTING EASEMENT
- EXISTING SEWER
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR

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REVISION

NO.	REVISION	DATE
1	REVISED PROFILE DEPTHS	02/28/20
2	VERTICAL REALIGNMENT	09/01/20



PAPE-DAWSON ENGINEERS
 NEW BRAUNFELS | SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
 1675 INDEPENDENCE DR. STE 102 | NEW BRAUNFELS, TX 78132 | 210.375.9000
 TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION #470

VERAMENDI SANITARY SEWER S1-S6
 NEW BRAUNFELS, TEXAS
 SANITARY SEWER PLAN AND PROFILE SHEET
 STA 43+00 TO STA 53+00

JOB NO. 7620-56
 DATE JULY 2019
 DESIGNER RM
 CHECKED JD DRAWN BS
 SHEET C2.03

TRENCH EXCAVATION SAFETY PROTECTION

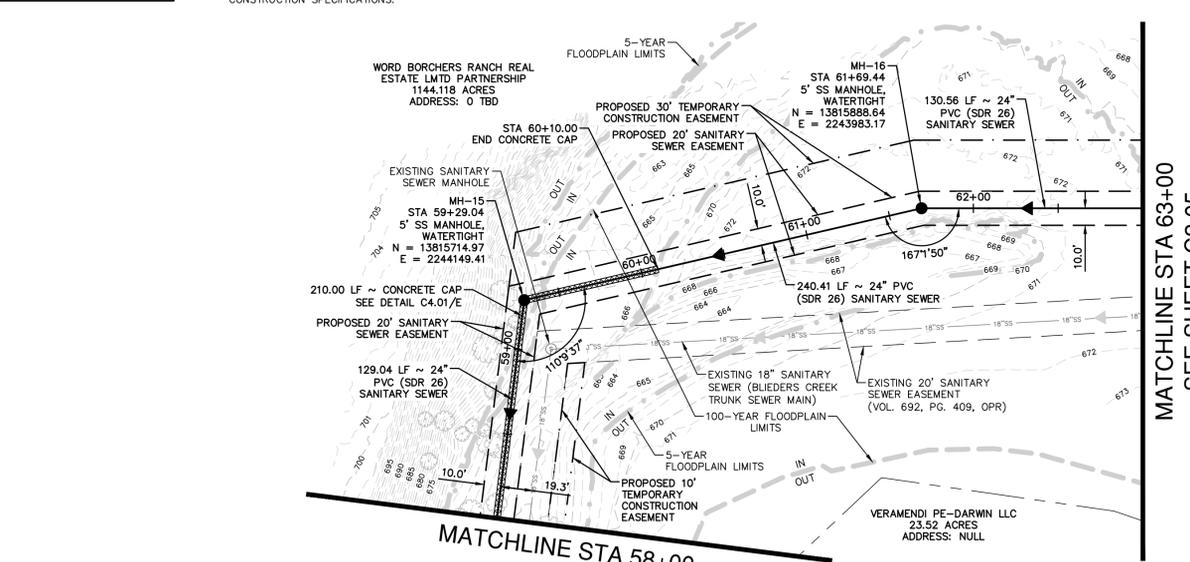
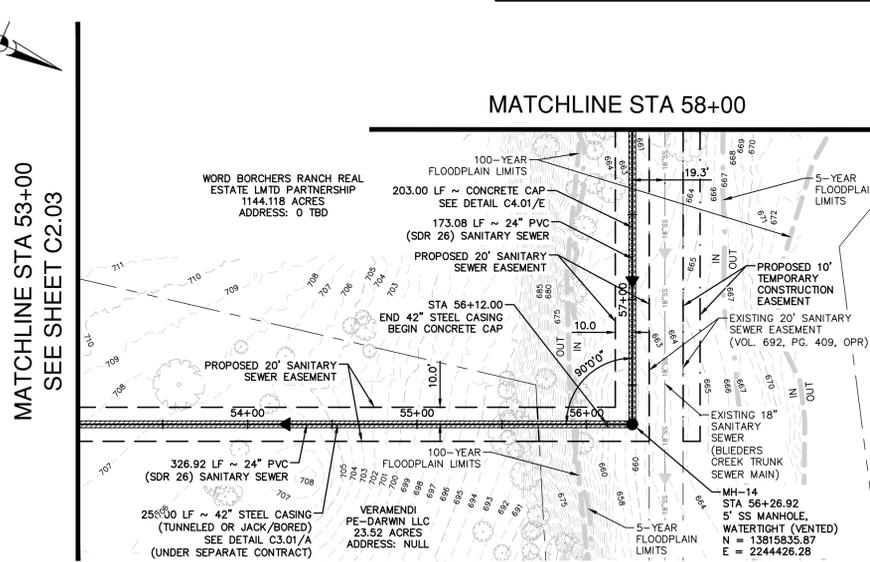
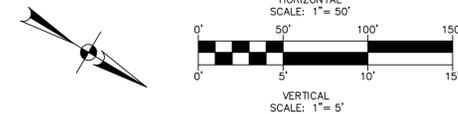
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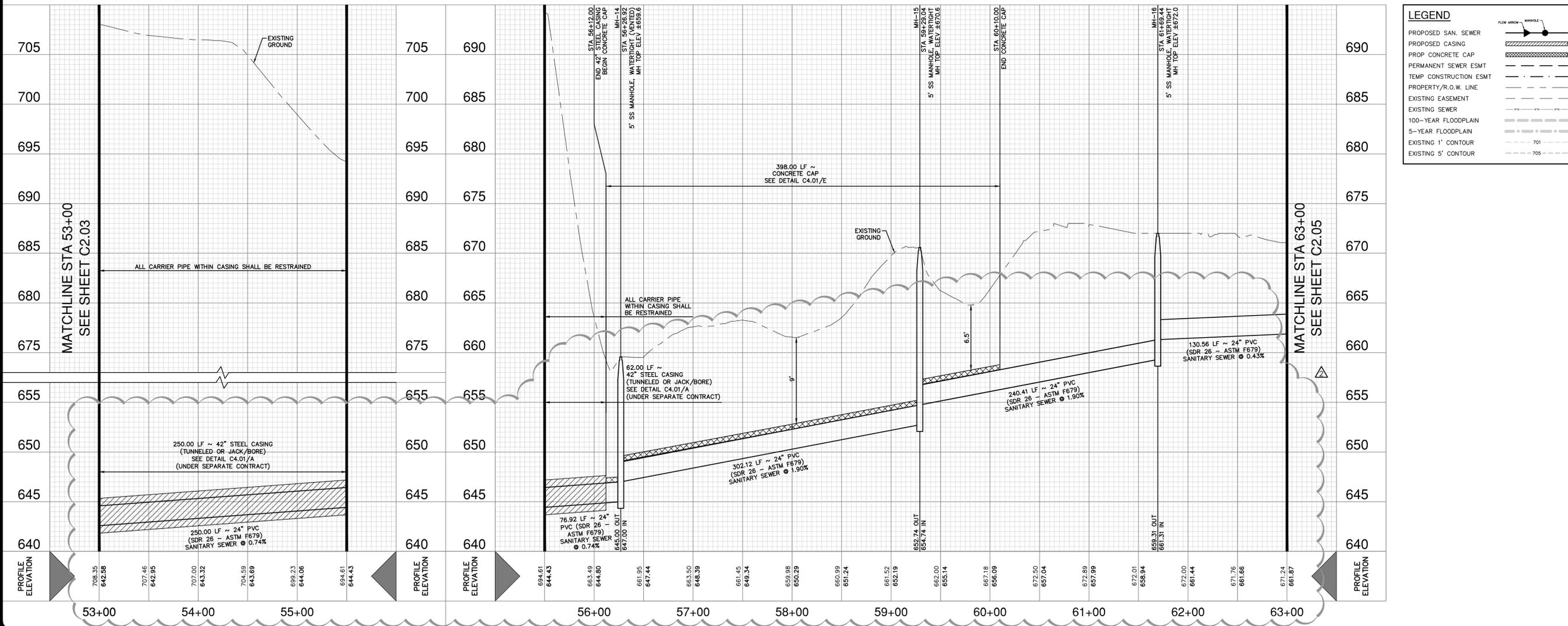


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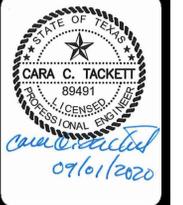
SHEET TOTALS

ITEM	UNIT	TOTAL
24" PVC (SDR 26) SANITARY SEWER (OPEN CUT)	LF	688
24" PVC (SDR 26) SANITARY SEWER (IN CASING), RESTRAINED	LF	312
42" STEEL CASING	LF	312
5' SS MANHOLES, WATERTIGHT	EA	2
5' SS MANHOLES, WATERTIGHT (VENTED)	EA	1
CONCRETE CAP	LF	398

24" PVC (SDR 26) SANITARY SEWER (STA 53+00 TO STA 63+00)



DATE: 02/28/20
REVISION: 09/01/20
NO. 1
REVISION: 09/01/20
NO. 2



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1675 INDEPENDENCE DR. STE 102 | NEW BRAUNFELS, TX 78132 | 210.375.9000
TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION #470

VERAMENDI SANITARY SEWER S1-S6
NEW BRAUNFELS, TEXAS
SANITARY SEWER PLAN AND PROFILE SHEET
STA 53+00 TO STA 63+00

JOB NO. 7620-56
DATE: JULY 2019
DESIGNER: RM
CHECKED: JD DRAWN: BS
SHEET: C2.04

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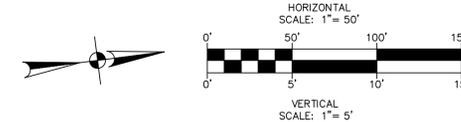
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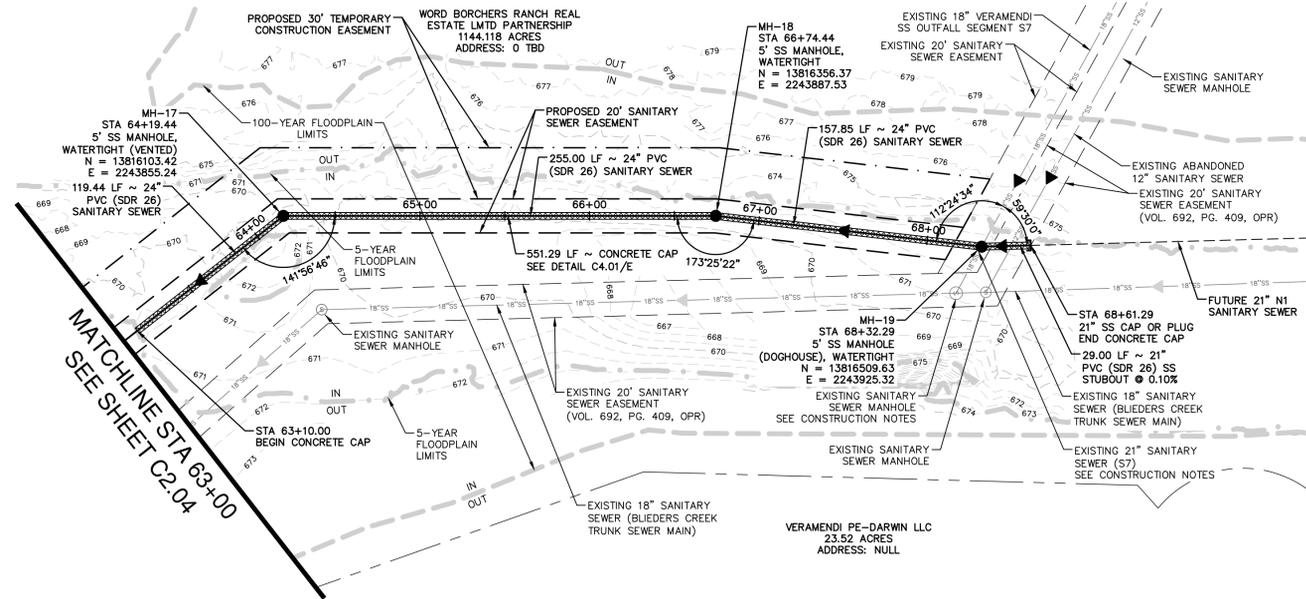
CONSTRUCTION NOTES

PRIOR TO PROJECT ACCEPTANCE BY NBU:

- EXISTING 18" SS (S7) SHALL REMAIN "HARD PIPED" THROUGH MH-19.

AFTER PROJECT ACCEPTANCE BY NBU:

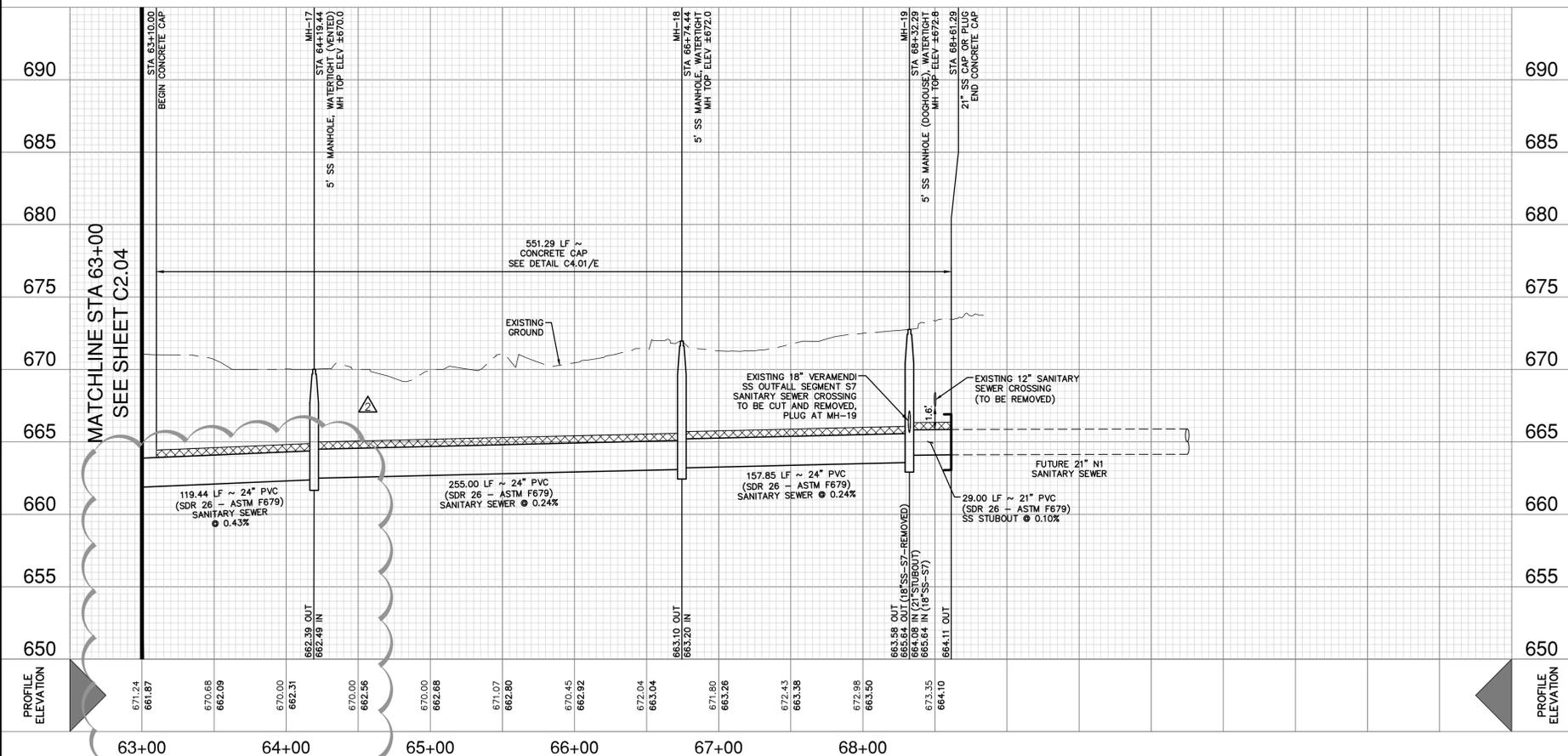
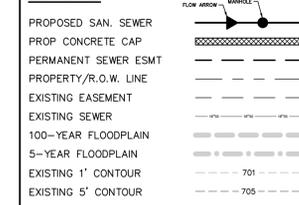
- PLUG 18" SS (S7) LINE BETWEEN MH-19 AND THE EXISTING MH ON THE EXISTING 18" SS (BLIEDERS CREEK TRUNK SEWER MAIN).
- CONTRACTOR SHALL CUT AND REMOVE 18" SS "HARD PIPE" IN MH-19.



**24" PVC (SDR 26) SANITARY SEWER
(STA 63+00 TO STA 68+61.29)**

SHEET TOTALS		
ITEM	UNIT	TOTAL
24" PVC (SDR 26) SANITARY SEWER (OPEN CUT)	LF	533
21" PVC (SDR 26) SANITARY SEWER (OPEN CUT)	LF	29
5' SS MANHOLES, WATERTIGHT	EA	1
5' SS MANHOLES (DOGHOUSE), WATERTIGHT	EA	1
5' SS MANHOLES, WATERTIGHT (VENTED)	EA	1
21" SS CAP OR PLUG	EA	1
CONCRETE CAP	LF	552

LEGEND



NO.	REVISION	DATE
1	VERTICAL REALIGNMENT	09/01/20



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VERAMENDI SANITARY SEWER S1-S6
 NEW BRAUNFELS, TEXAS
 SANITARY SEWER PLAN AND PROFILE SHEET
 STA 63+00 TO STA 68+61.29

JOB NO.	7620-56
DATE	JULY 2019
DESIGNER	RM
CHECKED	JD DRAWN BS
SHEET	C2.05

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1. ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEO-TECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. EACH LAYER OF MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEO-TECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 100' FOR EACH LIFT. UPON COMPLETION OF TESTING THE GEO-TECHNICAL ENGINEER SHALL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FILL MATERIAL HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.

2. ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS.

3. THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5- FEET IN DEPTH. DEEP TRENCHES POSE COMPACTION TESTING AND CONSTRUCTION CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY INSTALLATION.

4. ALL CONSTRUCTION METHODS, TESTING, AND ACCEPTANCE REQUIREMENTS, INCLUDING MATERIALS SHALL COMPLY WITH NBU CONSTRUCTION SPECIFICATIONS.

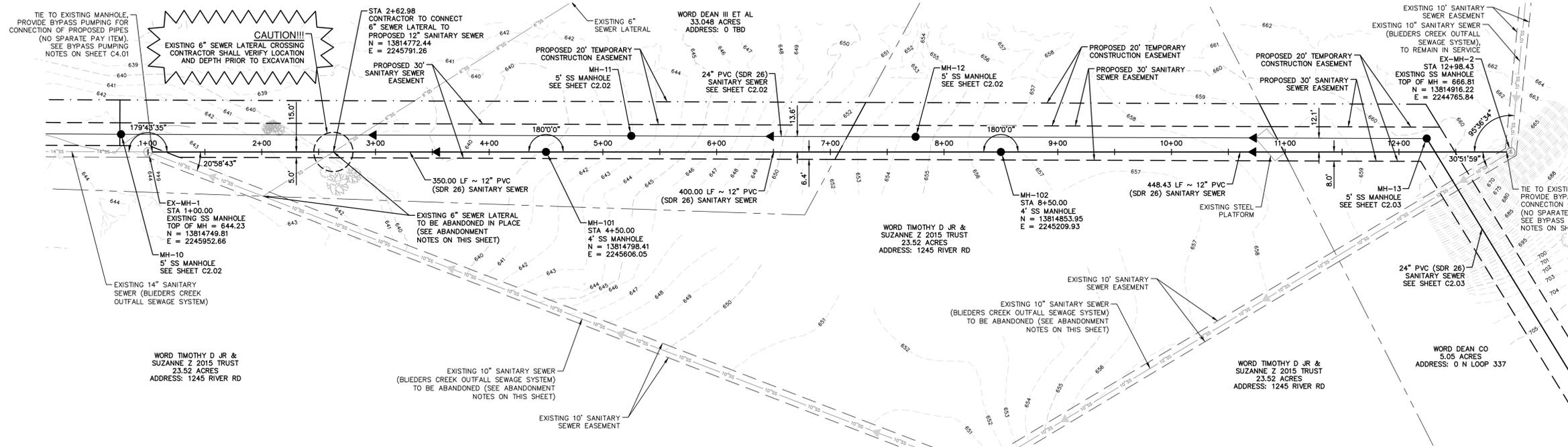
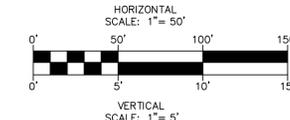
SANITARY SEWER NOTES

1. CONTRACTOR TO FIELD-VERIFY EXISTING SANITARY SEWER ELEVATIONS PRIOR TO CONSTRUCTION.

2. ALL MANHOLE COVERS SHALL BE SECURED WITH FOUR (4) STAINLESS STEEL (SS304 OR BETTER) BOLTS. BOLTS THAT ARE DIRECTLY THREADED INTO THE UNDERLYING CAST-IRON FRAME SHALL BE THOROUGHLY COATED WITH NIKAL JET LUBE OR APPROVED ALTERNATE BEFORE INSERTION TO AVOID SEIZING FROM DISSIMILAR METALS.

3. THE UNDERSIDE OF EACH MANHOLE COVER SHALL BE EQUIPPED WITH A CONTINUOUS (ONE-PIECE) VULCANIZED "T-SHAPED" GASKET FOR PERIMETER LEAKAGE SEALING. THE GASKET SHALL BE OF NITRILE, NEOPRENE, OR EPDM CONSTRUCTION AND PRE-INSERTED INTO A PERIMETER RETAINER SCOT BY THE MANUFACTURER. FIELD REPAIRS OF A DAMAGED GASKET SHALL NOT BE ATTEMPTED AND ARE NOT ALLOWED.

4. ALL SANITARY SEWER MANHOLE MATERIAL AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH 30 TCEG, CHAPTER 217.



LEGEND

- PROPOSED SAN. SEWER
- PERMANENT SEWER ESMT
- TEMP CONSTRUCTION ESMT
- PROPERTY/R.O.W. LINE
- EXISTING EASEMENT
- EXISTING SEWER
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR

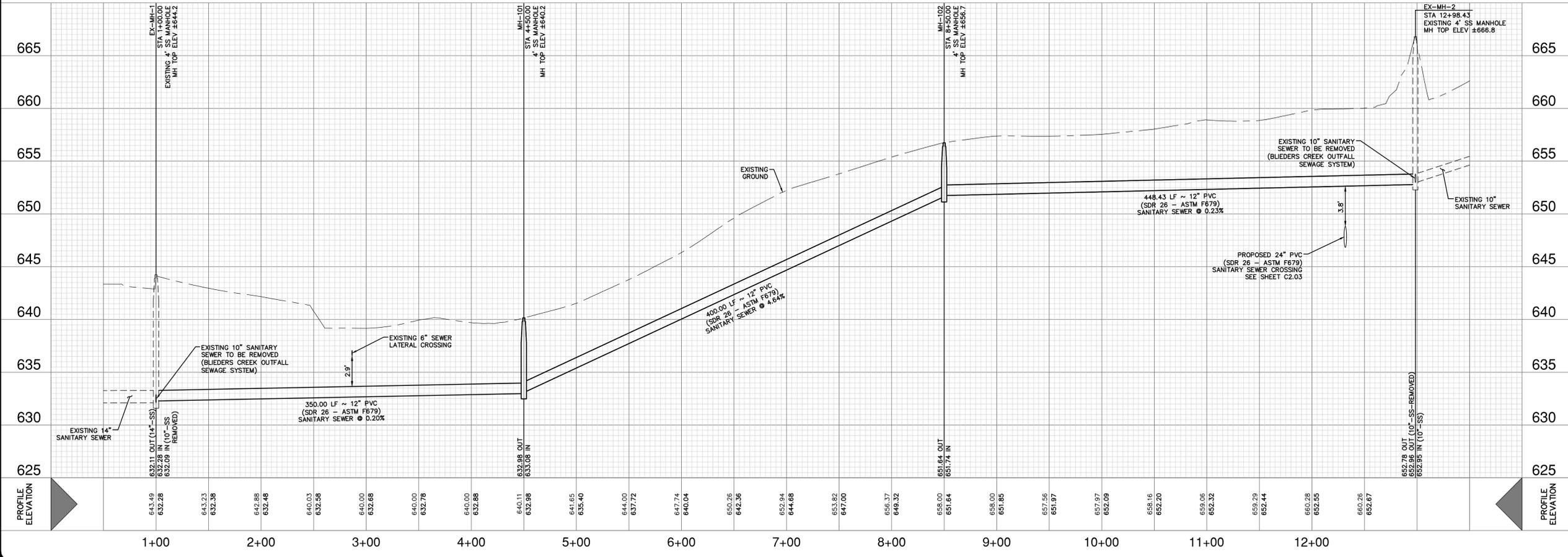
12" PVC (SDR 26) SANITARY SEWER (STA 1+00 TO STA 12+98.43)

ABANDONMENT NOTES

- CONTRACTOR SHALL PRESSURE WASH MAINS AND MANHOLES TO BE ABANDONED PRIOR TO ABANDONMENT.
- CONTRACTOR SHALL ABANDON THE 10" SANITARY SEWER MAIN AS SHOWN ON THE PLANS BY FILLING THE MAIN WITH FLOWABLE FILL.
- CONTRACTOR SHALL FILL ALL MANHOLES TO BE ABANDONED WITH FLOWABLE FILL.

SHEET TOTALS

ITEM	UNIT	TOTAL
12" PVC (SDR 26) SANITARY SEWER (OPEN CUT)	LF	1,199
4" SS MANHOLES, STANDARD	EA	2



Note: Doc. No. 2019-07-16, User ID: 85411, File Path: \\s01\p01\2019\07\16\2019-07-16\2019-07-16.dwg

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DATE	NO.	REVISION



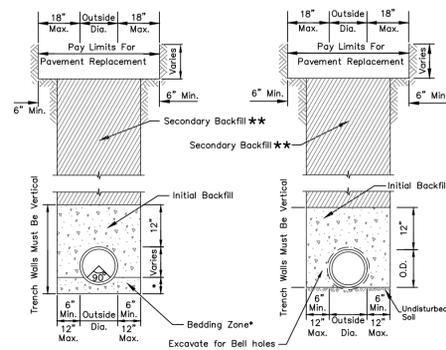
PAPE-DAWSON ENGINEERS

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 1675 INDEPENDENCE DR. STE 102 | NEW BRAUNFELS, TX 78132 | 210.375.9000
 TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION #470

VERAMENDI SANITARY SEWER S1-S6
 NEW BRAUNFELS, TEXAS

SANITARY SEWER PLAN AND PROFILE SHEET
 12" SEWER - STA 1+00 TO STA 12+98.43

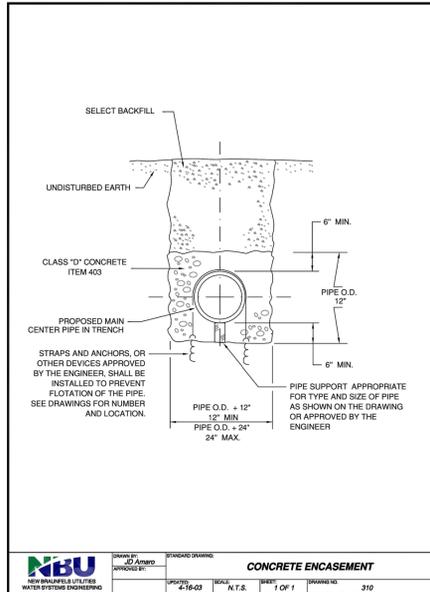
JOB NO. 7620-56
 DATE JULY 2019
 DESIGNER RM
 CHECKED JD DRAWN BS
 SHEET C2.06



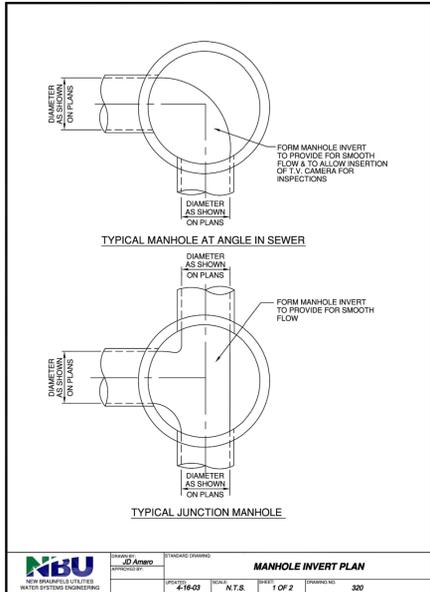
* Sewer Gravel 6" Min. or 1/8 O.D. of the pipe, whichever is greater as directed by the Inspector
 Pipe bedding of wastewater lines shall be manufactured sand or pea gravel as per NBU specifications.

** SECONDARY BACKFILL OF WASTEWATER LINES SHALL MEET NBU AND CITY OF NEW BRAUNFELS SPECIFICATIONS AND SHALL GENERALLY CONSIST OF MATERIALS REMOVED FROM THE TRENCH AND SHALL BE FREE FROM BRUSH, DEBRIS AND TRASH, NO ROCKS OR STONES HAVING ANY DIMENSION LARGER THAN 6 INCHES AT THE LARGEST DIMENSION.

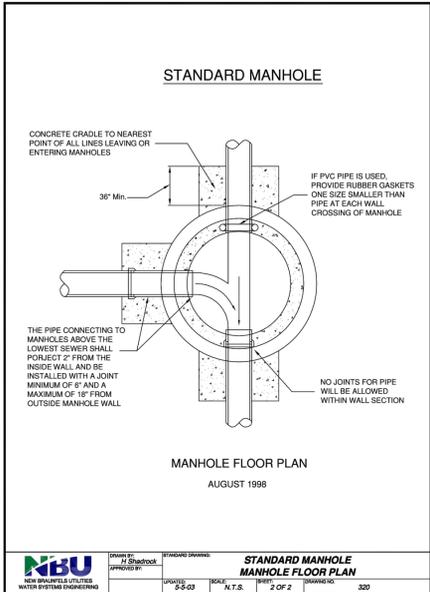
SANITARY SEWER PIPE LAID IN TRENCH (OUTSIDE OF PAVEMENT)
 NOT TO SCALE



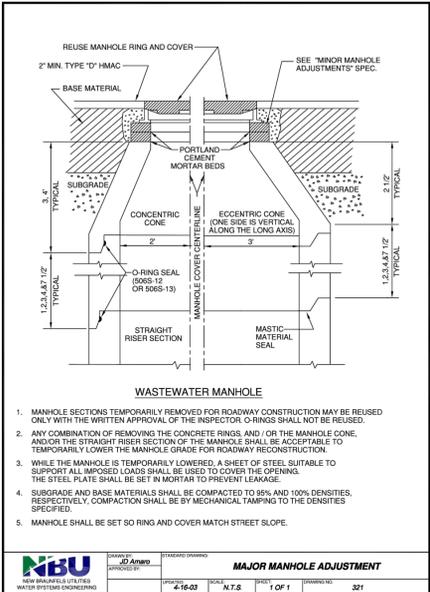
CONCRETE ENCASEMENT
 4-16-03 N.T.S. 1 OF 1 310



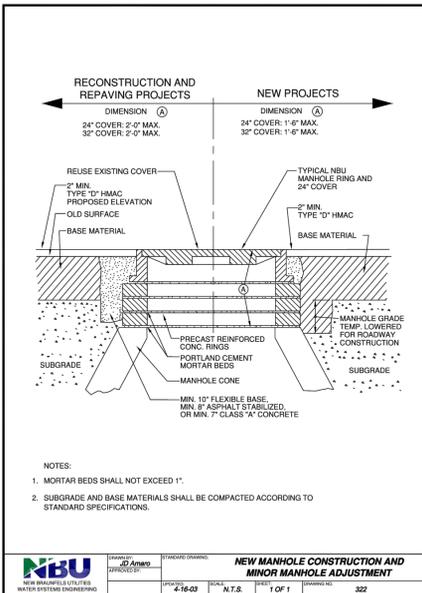
MANHOLE INVERT PLAN
 4-16-03 N.T.S. 1 OF 2 320



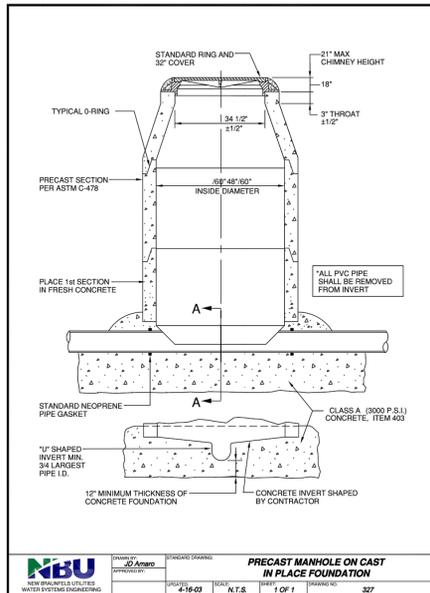
STANDARD MANHOLE MANHOLE FLOOR PLAN
 4-16-03 N.T.S. 2 OF 2 320



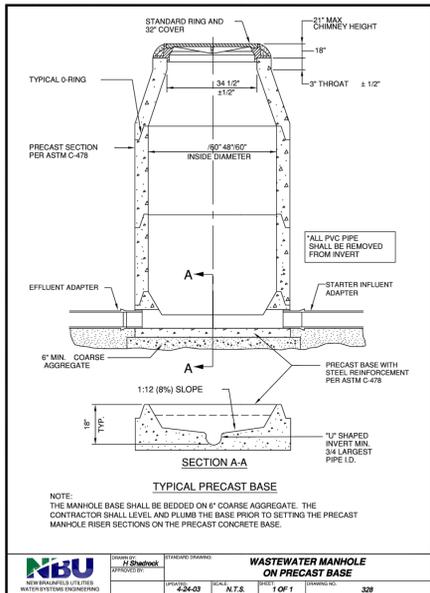
MAJOR MANHOLE ADJUSTMENT
 4-16-03 N.T.S. 1 OF 1 321



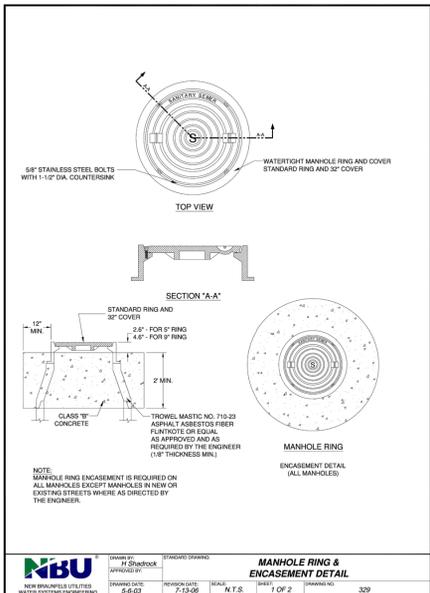
NEW MANHOLE CONSTRUCTION AND MINOR MANHOLE ADJUSTMENT
 4-16-03 N.T.S. 1 OF 1 322



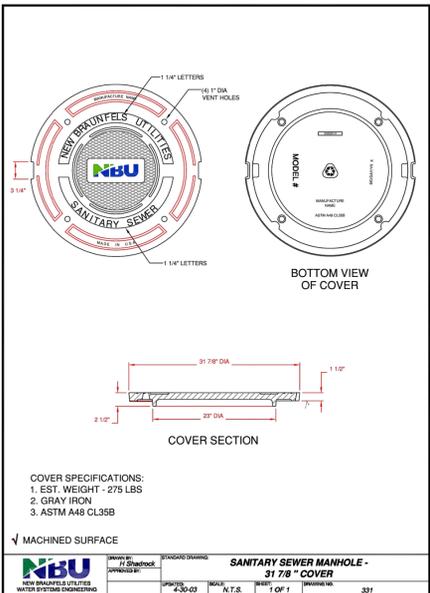
PRECAST MANHOLE ON CAST IN PLACE FOUNDATION
 4-16-03 N.T.S. 1 OF 1 327



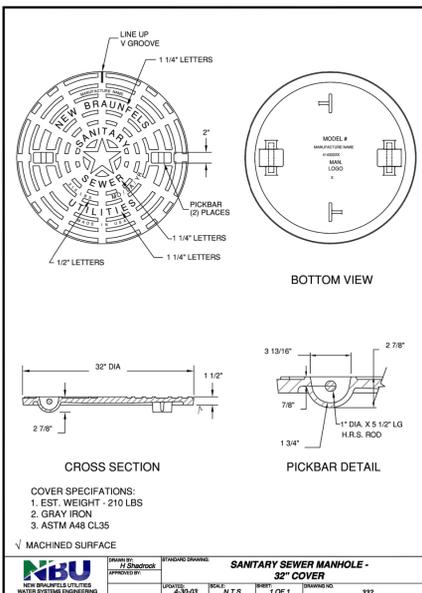
WASTEWATER MANHOLE ON PRECAST BASE
 4-24-03 N.T.S. 1 OF 1 328



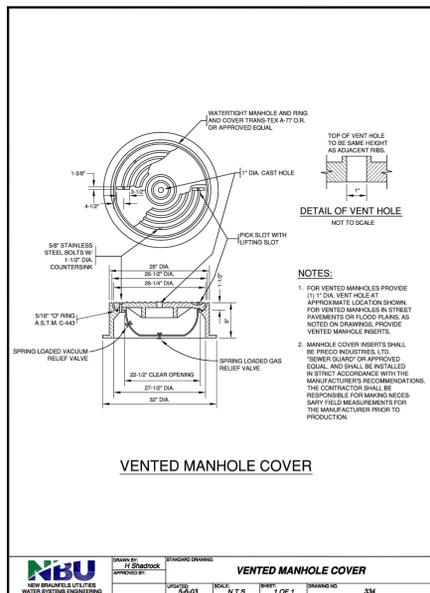
MANHOLE RING & ENCASEMENT DETAIL
 4-6-02 N.T.S. 1 OF 2 329



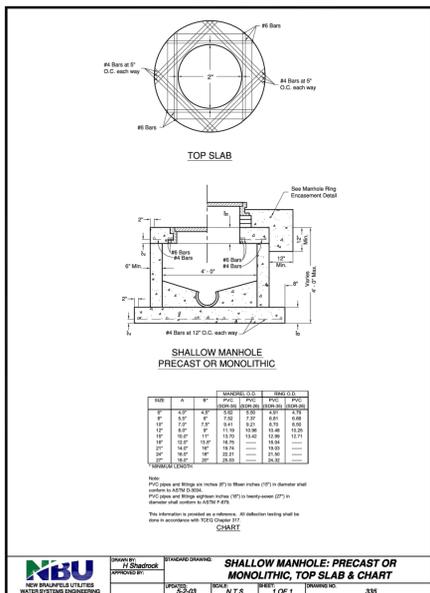
**SANITARY SEWER MANHOLE - 31 7/8\"/>
 4-30-03 N.T.S. 1 OF 1 331**



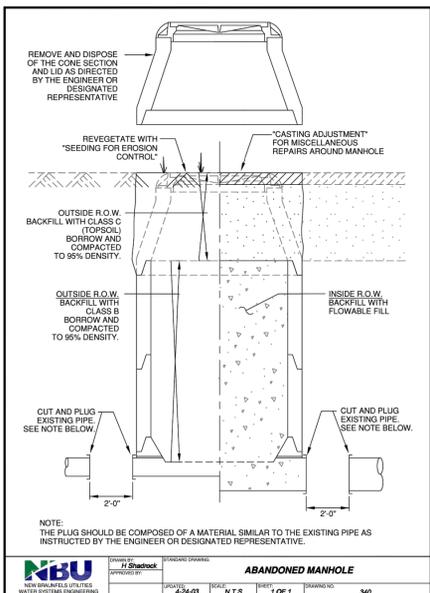
**SANITARY SEWER MANHOLE - 32\"/>
 4-30-03 N.T.S. 1 OF 1 332**



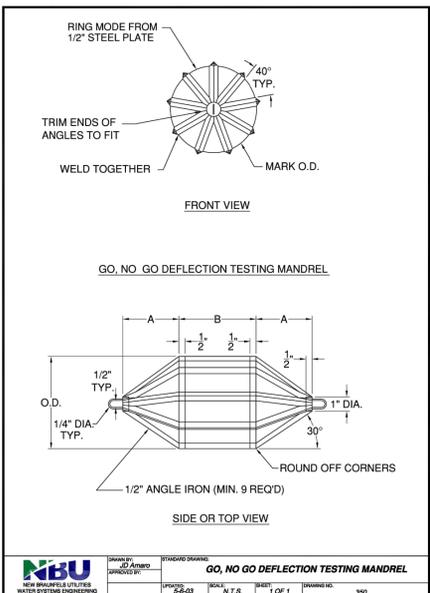
VENTED MANHOLE COVER
 4-6-03 N.T.S. 1 OF 1 334



SHALLOW MANHOLE: PRECAST OR MONOLITHIC, TOP SLAB & CHART
 5-2-03 N.T.S. 1 OF 1 335



ABANDONED MANHOLE
 4-24-03 N.T.S. 1 OF 1 340



GO, NO GO DEFLECTION TESTING MANDREL
 5-2-03 N.T.S. 1 OF 1 340

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NO.	REVISION

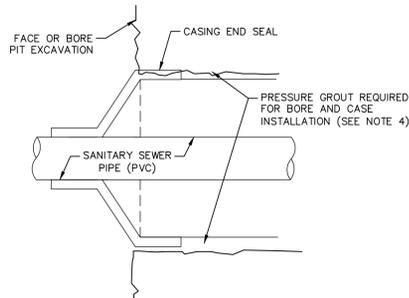


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 TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION #470

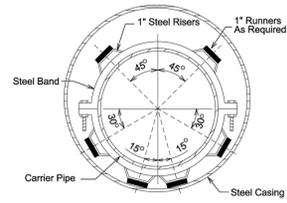
VERAMENDI SANITARY SEWER S1-S6
 NEW BRAUNFELS, TEXAS
 SANITARY SEWER DETAILS

JOB NO. 7620-56
 DATE JULY 2019
 DESIGNER RM
 CHECKED JD DRAWN BS
 SHEET C4.00

Note: Doc. No. 5019, 2/17/19, User ID: BSmith, File Path: \\s01\cadd\cadd\cadd\SSD1\762056.dwg



CASING END SEAL FOR JACK AND BORE INSTALLATION - PROFILE VIEW

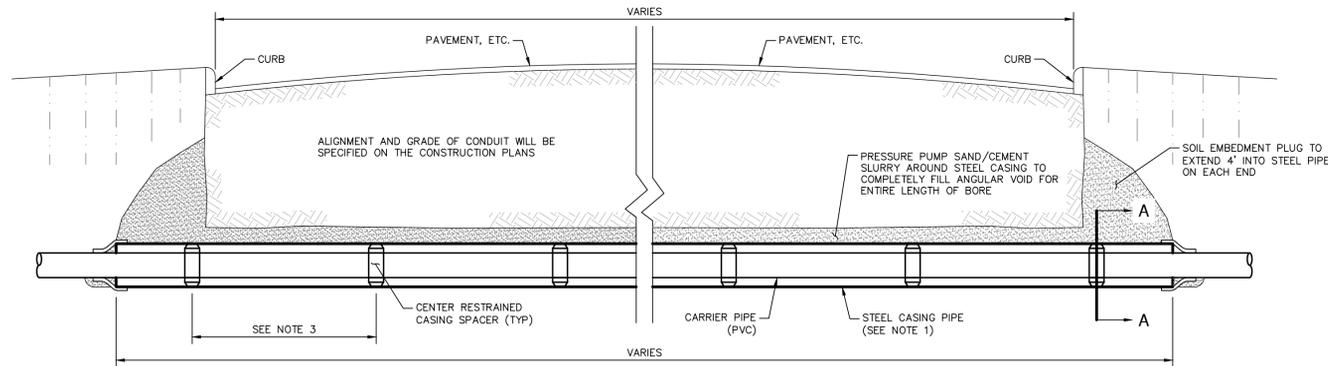


SECTION A-A SIZES 14\"/>

CASING DIMENSIONS				
MAIN SIZE, IN.	NOM. DIA. RCP* (I.D.) OR STEEL (O.D.) CONDUIT, IN.	STEEL PIPE THICKNESS, IN.	WEIGHT OF STEEL LBS/FT	NO. RUNNERS PER TIE
24	42	0.625	276.44	2 TOP, 4 BOTTOM

NOTES

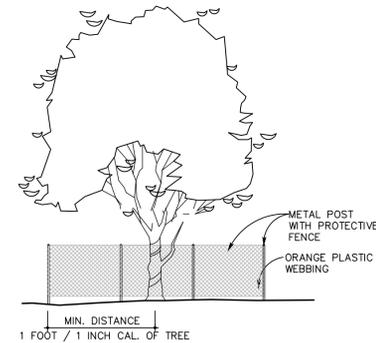
- CASING PIPE SHALL BE NEW STEEL PIPE MANUFACTURED IN ACCORDANCE WITH AWWA STANDARD C200, LATEST EDITION. WALL THICKNESS SHALL BE IN ACCORDANCE WITH CASING DIMENSION TABLE SHOWN ON THIS DETAIL.
- THE DISTANCE BETWEEN THE BACK OF THE CURB OR EDGE OF ASPHALT AND THE END OF THE CASING SHALL CONFORM TO THE REQUIREMENTS AND DISTANCES APPROVED IN THE BORING PERMIT.
- CASING INSULATORS SHALL BE IN ACCORDANCE WITH NBU STANDARD MATERIAL SPECIFICATIONS. INSULATORS SHALL BE SPACED AT A 10' INTERVAL OR PER PIPE MANUFACTURER'S RECOMMENDATION.
- FOR BORE AND CASE INSTALLATIONS THE ANNULAR SPACE BETWEEN THE CASING PIPE AND THE BOREHOLE SHALL BE COMPLETELY GROUTED USING NON-SHRINK GROUT. GROUTING SHALL BE ACCOMPLISHED THROUGH GROUT PORTS AT NO MORE THAN 10' CENTERS ALONG THE TOP AND BOTTOM OF THE CASING. CONTINUOUS MANUAL INSPECTION IS REQUIRED, WHICHEVER IS LESS.



C4.01 INSTALLATION OF PIPE IN CASING, OPEN CUT OR JACK AND BORE N.T.S.

TREE PRESERVATION NOTES

- ALL TREES TO REMAIN ON SITE REQUIRE PROTECTIVE FENCING, PRUNING, WATERING, AND FERTILIZATION AS DIRECTED BY A QUALIFIED ARBORIST.
- PROTECTIVE FENCING CONSISTS OF 4'-0" HIGH FENCE.
- FENCE TO EXTEND FROM TRUNK ONE FOOT FOR EVERY CALIPER INCH OF TREE (MINIMUM). THE OPTIMUM DISTANCE IS TO INSTALL FENCE DIRECTLY BENEATH DRIPLINE OF TREE TO REMAIN AS SHOWN.
- DURING CONSTRUCTION, NO EXCESS SOIL, FILL MATERIAL, EQUIPMENT, LIQUIDS, OR CONSTRUCTION DEBRIS SHALL BE PLACED WITHIN THE PROTECTIVE FENCING, NOR SHALL ANY SOIL BE REMOVED FROM WITHIN THE FENCING.
- ALL TREE PROTECTION MUST BE IN PLACE BEFORE CONSTRUCTION BEGINS.
- INSTALL 4" MINIMUM DEPTH OF SHREDDED MULCH BENEATH THE DRIPLINE OF THE TREE.



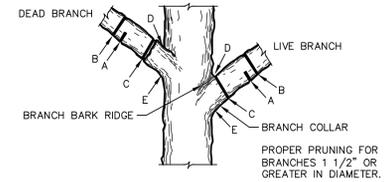
C4.01 TREE PRESERVATION DETAIL N.T.S.

TREE PRUNING NOTE S

DO NOT CUT FROM D TO E

- FIRST CUT** - TO PREVENT THE BARK FROM BEING PEELLED WHEN THE BRANCH FALLS.
- SECOND CUT** - TO REDUCE THE WEIGHT OF BRANCH.
- FINAL CUT** - ALLOW FOR HEALING COLLAR BUT NO STUBS
- BRANCH RIDGES** - INDENT PROPERLY BRANCH RIDGES WHICH ARE SITE FOR DECAY.

FOR OAKS ONLY. PAINT ALL WOUNDS OR CUTS WITH PRUNING PAINT WITHIN 20 MIN. TO PREVENT THE SPREAD OF OAK WILT.



C4.01 TREE PRUNING DETAIL N.T.S.

DATE	
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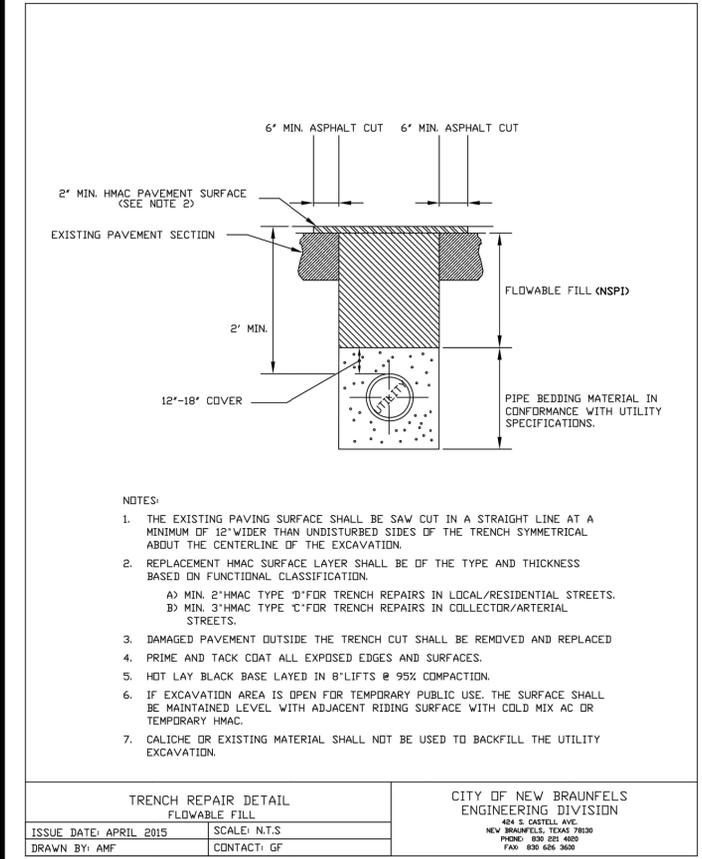


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VERAMENDI SANITARY SEWER S1-S6
 NEW BRAUNFELS, TEXAS
 SANITARY SEWER DETAILS

JOB NO.	7620-56
DATE	JULY 2019
DESIGNER	RM
CHECKED	JD DRAWN BS
SHEET	C4.01

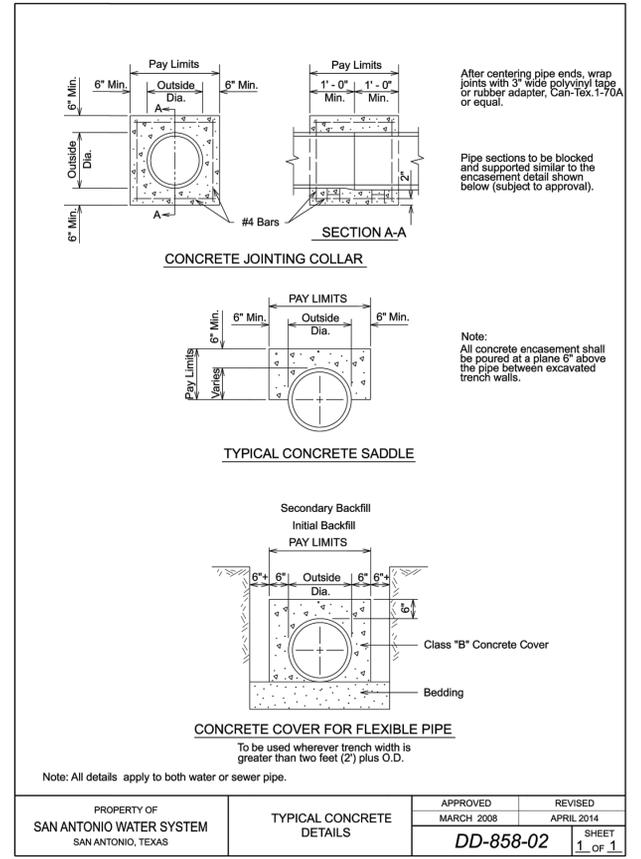
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- NOTES:**
- THE EXISTING PAVING SURFACE SHALL BE SAW CUT IN A STRAIGHT LINE AT A MINIMUM OF 12" WIDER THAN UNDISTURBED SIDES OF THE TRENCH SYMMETRICAL ABOUT THE CENTERLINE OF THE EXCAVATION.
 - REPLACEMENT HMAC SURFACE LAYER SHALL BE OF THE TYPE AND THICKNESS BASED ON FUNCTIONAL CLASSIFICATION.
 - MIN. 2" HMAC TYPE 'D' FOR TRENCH REPAIRS IN LOCAL/RESIDENTIAL STREETS.
 - MIN. 3" HMAC TYPE 'C' FOR TRENCH REPAIRS IN COLLECTOR/ARTERIAL STREETS.
 - DAMAGED PAVEMENT OUTSIDE THE TRENCH CUT SHALL BE REMOVED AND REPLACED.
 - PRIME AND TACK COAT ALL EXPOSED EDGES AND SURFACES.
 - HOT LAY BLACK BASE LAYED IN 8" LIFTS @ 95% COMPACTION.
 - IF EXCAVATION AREA IS OPEN FOR TEMPORARY PUBLIC USE, THE SURFACE SHALL BE MAINTAINED LEVEL WITH ADJACENT RIDING SURFACE WITH COLD MIX AC OR TEMPORARY HMAC.
 - CALLICHE OR EXISTING MATERIAL SHALL NOT BE USED TO BACKFILL THE UTILITY EXCAVATION.

TRENCH REPAIR DETAIL FLOWABLE FILL		CITY OF NEW BRAUNFELS ENGINEERING DIVISION	
ISSUE DATE: APRIL 2015	SCALE: N.T.S.	204 S. CASTELL AVE. NEW BRAUNFELS, TEXAS 78130	
DRAWN BY: AMF	CONTACT: GF	PHONE: 830.251.4000 FAX: 830.426.3600	

C4.01 TRENCH REPAIR DETAIL - FLOWABLE FILL N.T.S.



PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	TYPICAL CONCRETE DETAILS	APPROVED MARCH 2008	REVISED APRIL 2014
		DD-858-02	SHEET 1 OF 1

C4.01 TYPICAL CONCRETE DETAILS N.T.S.

- BYPASS PUMPING NOTES**
- BYPASS PUMPING SHALL BE NOT SEPARATE PAY ITEM.
 - THE EXISTING 10" SANITARY SEWER MAINS SHALL REMAIN IN SERVICE UNTIL ALL FLOW IS DIVERTED INTO THE NEW SEWER MAIN.
 - THE CONTRACTOR SHALL SUBMIT A BYPASS PUMPING PLAN TO NBU FOR FINAL APPROVAL.
 - THE CONTRACTOR SHALL SUBMIT AN ANCHORAGE PLAN AND CALCULATIONS TO ENSURE THAT ALL BYPASS PUMPS AND APPURTENANCES ARE PROPERLY ANCHORED. FLOW DIVERSION PIPES SHALL HAVE WATERTIGHT SEALS AT INLET AND OUTLET CONNECTIONS WITHIN EXISTING MANHOLES OR STRUCTURES AND PIPE SHALL BE CAPABLE OF REMAINING IN PLACE DURING A 100-YEAR STORM EVENT.
 - THE CONTRACTOR SHALL UTILIZE TRAFFIC CONTROL MEASURES IF ANY BYPASS PUMPING APPURTENANCES WILL BLOCK OR IMPED PEDESTRIAN OR VEHICULAR TRAFFIC. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE CITY OF NEW BRAUNFELS FOR APPROVAL PRIOR TO IMPLEMENTING ANY TRAFFIC CONTROL MEASURES. NO SEPARATE PAY ITEM.

- SANITARY SEWER OVERFLOW NOTES**
- THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT NO SANITARY SEWER OVERFLOWS (SSO) OCCUR AS A RESULT OF THEIR WORK. ALL CONTRACTOR PERSONNEL RESPONSIBLE FOR SSO PREVENTION AND CONTROL SHALL BE TRAINED ON PROPER RESPONSE. SHOULD AN SSO OCCUR, THE CONTRACTOR SHALL:
 - IDENTIFY THE SOURCE OF THE SSO AND NOTIFY TO NBU EMERGENCY OPERATIONS CENTER IMMEDIATELY AT 830-608-8800. PROVIDE THE ADDRESS OF THE SPILL AND AN ESTIMATE OF THE VOLUME OF FLOW.
 - ATTEMPT TO ELIMINATE THE SOURCE OF THE SSO.
 - CONTAIN SEWAGE FROM THE SSO TO THE EXTENT POSSIBLE TO PREVENT CONTAMINATION OF WATERWAYS.
 - CLEAN UP THE SPILL SITE (RETURN CONTAINED SEWAGE TO THE COLLECTION SYSTEM AS POSSIBLE) AND DISPOSED OF CONTAMINATED SOIL/MATERIALS.
 - CLEAN THE AFFECTED SEWER MAINS AND REMOVE ANY DEBRIS.
 SHOULD THE CONTRACTOR FAIL TO ADDRESS AN SSO IMMEDIATELY AND TO NBU SATISFACTION, THEY WILL BE RESPONSIBLE FOR ALL ADDITIONAL COSTS INCURRED BY NBU, INCLUDING ANY FINES.
 - THE CONTRACTOR SHALL PROVIDE BYPASS PUMPING AND FLOW MANAGEMENT AS NECESSARY OF SEWAGE AROUND EACH SEGMENT OF PIPE TO BE REPLACED.
 - THE CONTRACTOR SHALL SUBMIT BYPASS PLAN TO NBU FOR REVIEW AND APPROVAL PRIOR TO COMMENCEMENT OF THE CONSTRUCTION.
 - SEWER WORK AND CLEAN UP SHALL BE IN ACCORDANCE WITH GUIDELINES SET FORTH BY TCEQ AND NBU. THE CONTRACTOR SHALL IDENTIFY AND TRAIN PERSONNEL RESPONSIBLE FOR SPILLAGE PREVENTION AND CONTROL. THE CONTRACTOR SHALL ALSO DOCUMENT AND EDUCATE EMPLOYEES IN ADVANCE OF WORK ABOUT THE WORK ENVIRONMENT INCLUDING WHAT TO DO WHEN THERE ARE SEWER LEAKS AND HOW TO WORK SAFELY AROUND RAW SEWAGE.