VERAMENDI S8-S10

Organized Sewage Collection System Plan

June 2024

PAPE-DAWSON ENGINEERS

Transportation | Water Resources | Land Development | Surveying | Environmental

VERAMENDI S8-S10

Organized Sewage Collection System Plan

6/26/2024

June 2024

PAPE-DAWSON ENGINEERS

June 10, 2024

Ms. Lillian Butler
Texas Commission on Environmental Quality
Region 13
14250 Judson Road
San Antonio, Texas 78233-4480

Re: Veramendi S8-S10
Sewage Collection System Application

Dear Ms. Butler:

Please find included herein the Veramendi S8-S10 Sewage Collection System Application. This Sewage Collection System Application has been prepared to be consistent with the regulations of the Texas Administrative Code (30 TAC 213, 217 and 290) and current policies for development over the Edwards Aquifer Recharge Zone.

This Sewage Collection System Application applies to the 4,668.29 linear feet of sewer main proposed as part of this project. Please review the plan information for the items it is intended to address. If acceptable, provide a written approval of the plan in order that construction may begin at the earliest opportunity.

Appropriate review fees ($2,334.15) and fee application form are included. If you have questions or require additional information, please do not hesitate to contact me at your earliest convenience.

Sincerely,
Pape-Dawson Consulting Engineers, LLC

Jocelyn Perez, P.E.
Vice President

Attachments

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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 will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited**.
4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

Mid-Review Modifications

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

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

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

- If the technical review has begun your application can be denied/withdrawn, your fees will be forfeited, and the plan will have to be resubmitted.
- TCEQ can continue the technical review of the application as it was submitted, and a modification application can be submitted at a later time.

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

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

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

1. Regulated Entity Name: Veramendi S8-S10						**2. Regulated Entity No.:**			
3. Customer Name: Veramendi PE - Cairns, LLC						**4. Customer No.:**			
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):**		10.9	
9. Application Fee:	$2334.15		**10. Permanent BMP(s):**						
11. SCS (Linear Ft.):	4668.29		**12. AST/UST (No. Tanks):**						
13. County:	Comal		**14. Watershed:**					Blieders	

Application Distribution

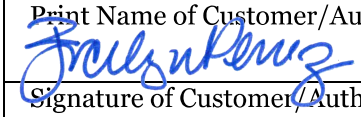
Instructions: Use the table below to determine the number of applications required. One original and one copy of the application, plus additional copies (as needed) for each affected incorporated city, county, and groundwater conservation district are required. Linear projects or large projects, which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

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

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

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

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

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review. Jocelyn Perez, P.E.
Print Name of Customer/Authorized Agent  6/26/2024
Signature of Customer/Authorized Agent Date

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

GENERAL INFORMATION FORM (TCEQ-0587)

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: Jocelyn Perez, P.E.

Date: 6/26/2024

Signature of Customer/Agent:

Project Information

1. Regulated Entity Name: Veramendi S8-S10
2. County: Comal
3. Stream Basin: Blieders Creek
4. Groundwater Conservation District (If applicable): Edwards Aquifer
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

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

7. Customer (Applicant):

   Contact Person: Garrett Mechler
   Entity: Veramendi PE - Cairns, LLC
   Mailing Address: 2168 Oak Run Parkway, Suite 101
   City, State: New Braunfels, TX Zip: 78132
   Telephone: (830) 643-1338 FAX: _____
   Email Address: garrett.mechler@asaproperties.us.com

8. Agent/Representative (If any):

   Contact Person: Jocelyn Perez, P.E.
   Entity: Pape-Dawson Engineers, LLC
   Mailing Address: 1672 Independence Drive, Suite 102
   City, State: New Braunfels, TX Zip: 78132
   Telephone: (830) 632-5633 FAX: _____
   Email Address: jperez@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's regional office, turn left and proceed approximately 1.5 milies to IH-35 north and turn left. Travel approximately 14.5 miles to exit 184 toward TX-337 and turn left. Proceed approximately 3.5 miles to Borchers Blvd on the left. The project site is located approximately 0.3 miles NW of the Borchers Blvd and Loop 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 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)

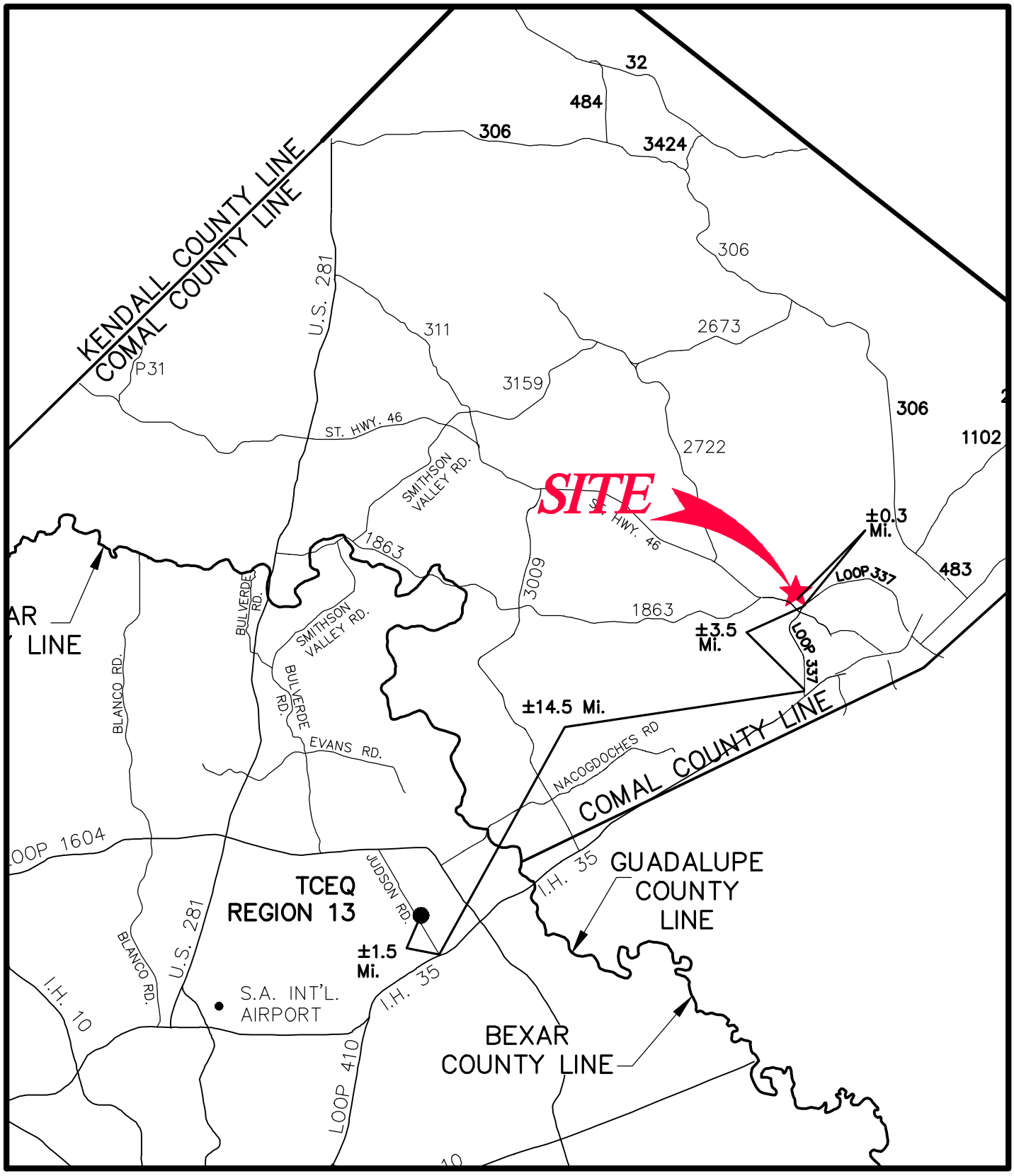
20. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies 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 S8-S10
Sewage Collection System Application

NOT TO SCALE



Pape-Dawson Engineers, Inc.
Date: Jun 07, 2024, 4:50pm User ID: cpresley
File: P:\300\01\80\Design\Environmental\240607 – RM 3000180.dwg

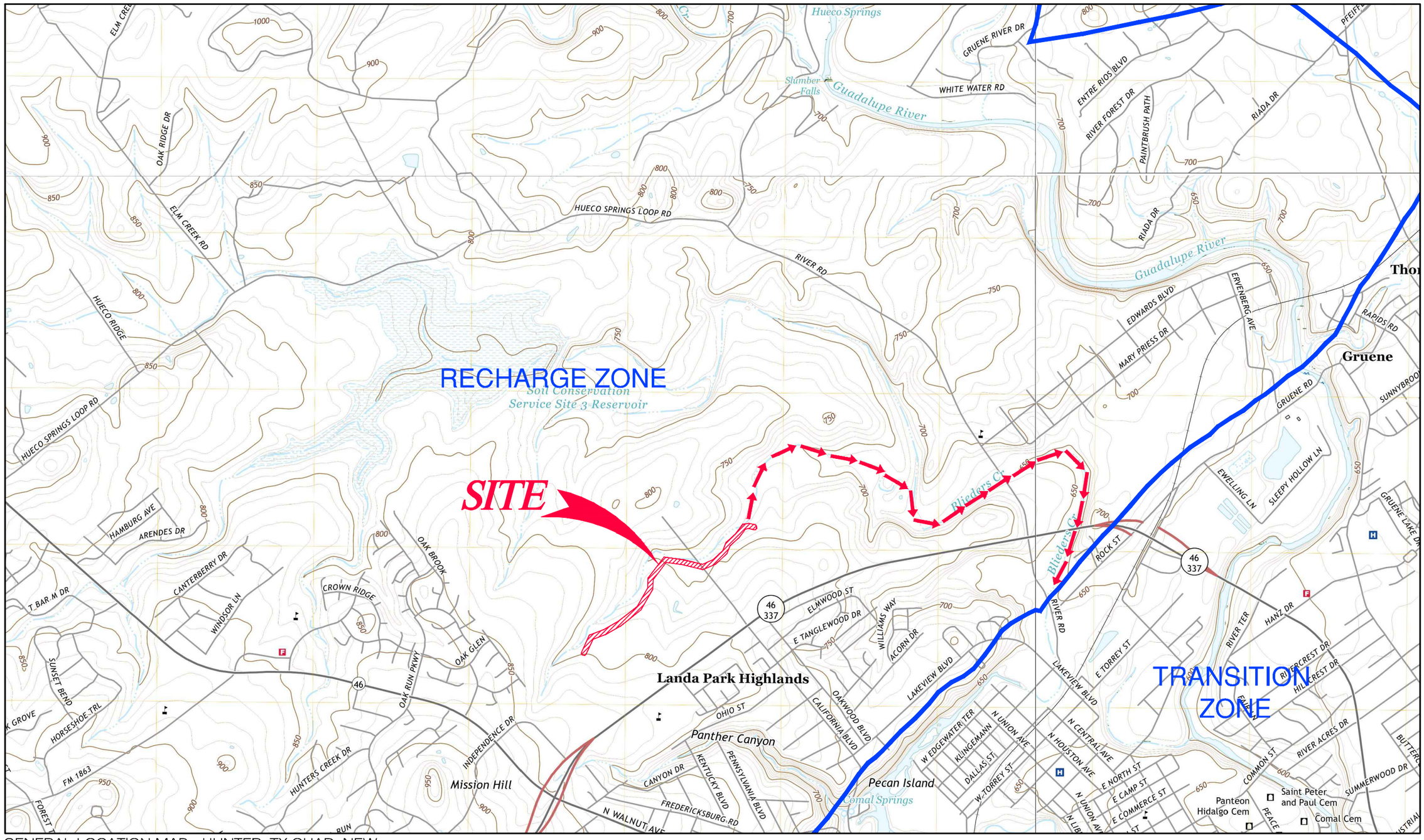
ATTACHMENT A
Road Map

ATTACHMENT B

VERAMENDI S8-S10
Sewage Collection System Application

N

SCALE: 1" = 2000'



Date: May 15, 2024, 3:25pm User ID: cpresley
File: P:\300\01\80\Design\Environmental\2D 3000180.dwg

GENERAL LOCATION MAP - HUNTER, TX QUAD; NEW BRAUNFELS EAST, TX QUAD
DRAINAGE FLOW → →
Pape-Dawson Engineers, Inc.

USGS/EDWARDS RECHARGE ZONE MAP
ATTACHMENT B

ATTACHMENT C

Attachment C – Project Description

Veramendi S8-S10 is a ± 4669 LF sewer line within the city of New Braunfels ETJ in Comal County, Texas. The site is located approximately 0.3 miles NW of the intersection of Borchers Blvd and Loop 337. The site is currently undeveloped, lies within the Blieders Creek watershed, and does not contain 100-year floodplain.

This Sewage Collection System (SCS) Application proposes the construction of a total of approximately 4668.29 linear feet (LF) of sanitary sewer main to serve the proposed developments over the Edwards Aquifer Recharge Zone. The proposed alignment will consist of approximately 3095.35 linear feet (LF) of 8-inch (8") polyvinyl chloride (PVC), SDR 26 gravity sewer main, 1106.18 linear feet (LF) of 12-inch (12") polyvinyl chloride (PVC), SDR 26 gravity sewer main, 446.75 linear feet (LF) of 8-inch (8") PVC, SDR 26 160-psi pressure rated sewer main, and 20 linear feet (LF) of 12-inch (12") PVC, SDR 26 160-psi pressure rated sewer main centered at water line crossings, see included plan and profile exhibits for details. Regulated activities proposed include excavation, construction of sewer mains, manholes, backfill, and compaction. Approximately 10.9 acres may be disturbed as identified by the limits of the fifty foot (50') SCS/GA envelope shown on the plans.

This project will add approximately 1634 Living Unit Equivalents (LUEs) upon completion of ultimate build out. No Stub-outs are proposed with this SCS as this will complete this phase of the development.

Any future sewage flow will be disposed of by conveyance to the existing Gruene Wastewater Treatment Center operated by the New Braunfels Utilities (NBU). Potable water will be supplied by NBU.

GEOLOGIC ASSESSMENT FORM (TCEQ-0585)

Geologic Site Assessment (WPAP)

for Regulated Activities / Development
on the Edwards Aquifer Recharge / Transition Zone

The Veramendi Subdivision
+/- 2,400 Acres
New Braunfels, Texas

FROST GEOSCIENCES CONTROL # FGS-E10139

May 9, 2017

Prepared exclusively for

ASA Properties, LLC
2021 SH 46, Suite 101
New Braunfels, Texas 78132

Frost GeoSciences

Geotechnical ▪ Construction Materials
Forensics ▪ Environmental

13402 Western Oak • Helotes, Texas 78023 • Phone: (210) 372-1315 • Fax: (210) 372-1318

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Fax (210) 372-1318
www.frostgeosciences.com
TBPE Firm Registration # F-9227
TBPG Firm Registration # 50040

May 9, 2017

ASA Properties, LLC
2021 SH 46, Suite 101
New Braunfels, Texas 78132

Attn: Mr. Max Hartford

Re: Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The Veramendi Subdivision
+/- 2,400 Acres
New Braunfels, Texas

Frost GeoSciences, Inc. Control # FGS-E10139

Dear Sir:

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.

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

Distribution: (1) ASA Properties, LLC
(5) Pape Dawson Engineers

Table of Contents

Geologic Assessment

Texas Commission on Environmental Quality

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

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

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

Signature

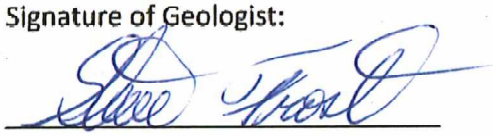
To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

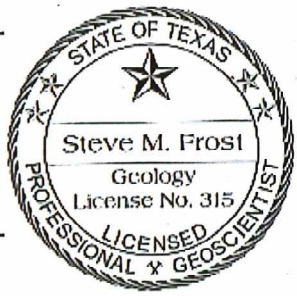
Print Name of Geologist: Steve Frost, C.P.G., P.G. Telephone: (210) 372-1315

Date: May 9, 2017 Fax: (210) 372-1318

Representing: Frost GeoSciences, Inc.

Signature of Geologist:





Regulated Entity Name: The Veramendi Subdivision

Project Information

1. Date(s) Geologic Assessment was performed: June 16 through November 23, 2010
2. Type of Project:
   - ☑ WPAP
   - ☐ SCS
   - ☐ AST
   - ☐ UST
3. Location of Project:
   - ☑ Recharge Zone
   - ☐ Transition Zone
   - ☐ Contributing Zone within the Transition Zone

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

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

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
Rumple-Comfort Association Undulating (RUD)	C/D	1 to 2
Comfort Rock Outcrop Complex Undulating (CrD)	D/D	0 to 2
Brackett-Rock Outctop-Comfort Complex Undulating (BtD)	C/D/D	0 to 2
Lewisville Silty Clay, 1 to 3 Percent Slopes (LeB)	B	2+
Medlin-Eckrant Assoc. (MED/MEC)	D	1-2
Orif Soils Frequently Flooded (Or)	A	2+

** Soil Group Definitions (Abbreviated)*

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

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

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

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

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

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

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

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

9. Method of collecting positional data:

   ☑ Global Positioning System (GPS) technology.
   ☑ Other method(s). Please describe method of data collection: 2010 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 9 (#) 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.
    - ☒ 7 The wells are not in use and will be properly abandoned.
    - ☒ 2 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			Hydrologic 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; *Ilymatogyra arletina*	None	None/primary upper confining unit
Lower Cretaceous	I	Edwards aquifer	Georgetown Formation			Karst AQ; not karst CU	2 – 20	Reddish-brown, gray to light tan marly limestone	Marker fossil; *Waconella wacoensis*	None	Low porosity/low permeability
	II		Edwards Group	Person Formation	Cyclic and marine members, undivided	AQ	80 – 90	Mudstone to packstone; *miliolid* 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	Bioturbated 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	*Miliolid* 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, *Toucasia* 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 *miliolid* grainstone	Massive, nodular and mottled, *Exogyra texana*	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											FGS-E10139					
LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
1	2*	3*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT³)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						< 40	≥ 40	<1.6	≥1.6	
S-1	29° 43.144'	98° 09.282'	CD	5	Kep	25	60	1.5		-	-	-	F	10	15	15		X		Hillside
S-2	29° 43.193'	98° 09.291'	CD	5	Kep	20	20	1		-	-	-	F	10	15	15		X		Hillside
S-3	29° 43.218'	98° 09.362'	SC	20	Kep	2	3	2		-	-	-	F	12	32	32		X		Hillside
S-4	29° 43.253'	98° 09.412'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-5	29° 43.635'	98° 08.837'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37			X	Drainage
S-6	29° 43.650'	98° 08.902'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37			X	Drainage
S-7	29° 43.660'	98° 08.978'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37			X	Drainage
S-8	29° 43.600'	98° 09.153'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-9	29° 43.497'	98° 08.917'	CD	5	Kep	65	200	6+		-	-	-	F	10	15	15			X	Hillside
S-10	29° 43.610'	98° 08.893'	CD	5	Kep	4	4	2		-	-	-	F	10	15	15		X		Hillside
S-11	29° 43.545'	98° 09.052'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-12	29° 43.298'	98° 09.381'	SC	20	Kep	2	2.5	1.5		-	-	-	O/F	12	32	32		X		Hillside
S-13	29° 43.539'	98° 09.168'	SC	20	Kep	0.25	1	1.5		-	-	-	O/F	10	30	30		X		Hillside
S-14	29° 43.500'	98° 09.079'	CD	5	Kep	4	4	2		-	-	-	X	10	15	15		X		Hillside
S-15	29° 43.497'	98° 09.096'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-16	29° 43.464'	98° 09.138'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-17	29° 43.449'	98° 09.174'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-18	29° 43.424'	98° 09.245'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-19	29° 43.371'	98° 09.270'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-20	29° 43.339'	98° 09.324'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-21	29° 43.298'	98° 09.381'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-22	29° 43.708'	98° 09.881'	CD	5	Kep	40	50	1.5		-	-	-	C/F	10	15	15		X		Hillside
S-23	29° 43.750'	98° 09.884'	SC	20	Kep	1.5	2	2		-	-	-	O/F	12	32	32		X		Hillside
S-24	29° 44.199'	98° 09.510'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37			X	Floodplain
S-25	29° 44.247'	98° 09.560'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37			X	Floodplain

* DATUM 1927 North American Datum (NAD27) Date May 9, 2017 Sheet 1 of 7

GEOLOGIC ASSESSMENT TABLE	PROJECT NAME: The Veramendi Subdivision	FGS-E10139

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1	2*	3*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT²)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						< 40	≥ 40	<1.6	≥1.6	
S-26	29° 44.148'	98° 09.382'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37			X	Floodplain
S-27	29° 43.909'	98° 09.970'	SC	20	Kep	0.5	1	3		-	-	-	O/F	12	32	32		X		Hillside
S-28	29° 44.178'	98° 09.317'	MB	30	Kep	03	3	?		-	-	-	X	7	37	37			X	Floodplain
S-29	29° 44.163'	98° 09.493'	MB	30	Kep	0.75	0.75	?		-	-	-	N	35	65		65	X		Hillside
S-30	29° 44.160'	98° 09.483'	CD	5	Kep	55	55	4		-	-	-	O/F	10	15	15			X	Hillside
S-31	29° 43.939'	98° 10.082'	SC	20	Kep	2	3	3.5		-	-	-	O/F	12	32	32		X		Hillside
S-32	29° 44.000'	98° 10.049'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-33	29° 44.056'	98° 09.963'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-34	29° 44.107'	98° 09.888'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-35	29° 44.147'	98° 09.825'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-36	29° 44.184'	98° 09.671'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37			X	Floodplain
S-37	29° 44.118'	98° 09.782'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37			X	Floodplain
S-38	29° 44.222'	98° 09.450'	SCZ	30	Kep	500	800	-		-	-	-	N/C	20	50		50		X	Floodplain
S-39	29° 44.121'	98° 09.285'	MB	30	Kep	150	225	-		-	-	-	N	4	34	34		X		Hillside
S-40	29° 43.882'	98° 09.046'	MB	30	Kep	0.75	0.75	?		-	-	-	N	35	65		65	X		Hilltop
S-41	29° 43.857'	98° 08.925'	MB	30	Kep	0.75	0.75	?		-	-	-	N	35	65		65	X		Hillside
S-42	29° 43.845'	98° 08.907'	CD	5	Kep	100	140	5		-	-	-	F	10	15	15		X		Hillside
S-43	29° 43.657'	98° 08.735'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-44	29° 43.656'	98° 08.736'	SC	20	Kep	1	1	2		-	-	-	O/F	12	32	32		X		Hillside
S-45	29° 43.680'	98° 08.719'	MB	30	Kep	30	75	-		-	-	-	C	7	37	37		X		Hillside
S-46	29° 43.693'	98° 08.7138'	MB	30	Kep	20	20	-		-	-	-	F	7	37	37		X		Hillside
S-47	29° 43.692'	98° 08.737'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37		X		Hillside
S-48	29° 43.718'	98° 08.743'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37			X	Drainage
S-49	29° 43.766'	98° 08.678'	O^{FR}	5	Kep	10	20	-	N 40°	10	1 / 2	0.08	C/F	20	35	35			X	Drainage
S-50	29° 43.770'	98° 08.672'	MB	30	Kep	3	3	?		-	-	-	X	7	37	37			X	Drainage

* DATUM 1927 North American Datum (NAD27) Date May 9, 2017 Sheet 2 of 7

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: The Veramendi Subdivision — FGS-E10139

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1	2*	3*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT²)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						< 40	≥ 40	<1.6	≥1.6	
S-51	29° 43.771'	98° 08.654'	MB	30	Kep	3	20	3		-	-	-	C	25	55		55		X	Drainage
S-52	29° 43.773'	98° 08.625'	O^{FR}	5	Kep	10	15	-	N 115°	-	1 / 1.5	0.08	C/F	25	30	30			X	Drainage
S-53	29° 43.775'	98° 08.617'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Drainage
S-54	29° 43.818'	98° 08.588'	SCZ	30	Kep	10	100	-	-	-	-	-	O/F	7	37	37		X		Hillside
S-55	29° 43.883'	98° 08.597'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Drainage
S-56	29° 43.937'	98° 08.605'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Drainage
S-57	29° 43.925'	98° 08.452'	CD	5	Kep	10	15	1.5	-	-	-	-	F	10	15	15		X		Hillside
S-58	29° 43.939'	98° 08.372'	CD	5	Kep	30	40	2	-	-	-	-	F	10	15	15		X		Hillside
S-59	29° 43.975'	98° 08.580'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Drainage
S-60	29° 44.029'	98° 08.493'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-61	29° 44.044'	98° 08.428'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-62	29° 44.005'	98° 08.297'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-63	29° 44.012'	98° 08.195'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Floodplain
S-64	29° 43.956'	98° 08.983'	C	30	Kep	2	3	5+	-	-	-	-	N	30	60		60	X		Hillside
S-65	29° 43.958'	98° 08.095'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Floodplain
S-66	29° 43.897'	98° 08.002'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Floodplain
S-67	29° 43.882'	98° 07.978'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-68	29° 43.818'	98° 07.985'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-69	29° 43.768'	98° 07.996'	SC	20	Kep	10+	20	0.75	-	-	-	-	N	9	29	29			X	Floodplain
S-70	29° 43.775'	98° 07.961'	O^{VR}	5	Kep	3	15	2	-	-	3 / 1	0.06	N	9	14	14			X	Floodplain
S-71	29° 43.758'	98° 07.937'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-72	29° 43.782'	98° 07.870'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-73	29° 43.755'	98° 07.905'	SC	20	Kep	1	1.5	6+	-	-	-	-	N	9	29	29		X		Cliff
S-74	29° 43.782'	98° 07.855'	SCZ	30	Kep	30	600	-	-	-	-	-	N/O/F	9	39	39			X	Floodplain
S-75	29° 43.830'	98° 07.785'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed

* DATUM 1927 North American Datum (NAD27) Date May 9, 2017 Sheet 3 of 7

GEOLOGIC ASSESSMENT TABLE	PROJECT NAME: The Veramendi Subdivision	FGS-E10139

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1	2*	3*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT²)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						< 40	≥ 40	<1.6	≥1.6	
S-76	29° 43.882'	98° 07.978'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-77	29° 43.748'	98° 08.053'	CZ/SHZ	30	Kep	100	100	-	-	-	-	-	O/F	35	65		65	X		Hilltop
S-78	29° 43.876'	98° 08.041'	MB	30	Kep	0.75	0.75	?	-	-	-	-	N	35	65		65	X		Hillside
S-79	29° 43.868'	98° 08.030'	CD	5	Kep	100	100	4	-	-	-	-	F	10	15	15			X	Hillside
S-80	29° 44.001'	98° 07.965'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Floodplain
S-81	29° 44.079'	98° 07.992'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Floodplain
S-82	29° 44.158'	98° 08.022'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Floodplain
S-83	29° 44.232'	98° 08.069'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Floodplain
S-84	29° 44.305'	98° 08.113'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Floodplain
S-85	29° 44.385'	98° 08.165'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-86	29° 44.434'	98° 08.303'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Floodplain
S-87	29° 43.614'	98° 08.322'	CD	5	Kep	5	8	1	-	-	-	-	F	10	15	15		X		Hillside
S-88	29° 43.943'	98° 08.271'	SC	20	Kep	2	2.5	1	-	-	-	-	F	12	32	32		X		Hillside
S-89	29° 43.984'	98° 08.235'	SCZ	20	Kep	30	120	-	-	-	-	-	N/O	10	30	30		X		Hillside
S-90	29° 44.169'	98° 08.185'	CD	5	Kep	4	6	1	-	-	-	-	F	10	15	15		X		Hillside
S-91	29° 44.009'	98° 08.301'	OFR	5	Kep	12	150	-	N 140°	-	1 / 2	0.08	C/F	25	30	30			X	Floodplain
S-92	29° 44.060'	98° 08.378'	SH	20	Kep	30	60	3	-	-	-	-	F	19	39	39		X		Hillside
S-93	29° 44.217'	98° 07.989'	CD	5	Kep	2	2.5	0.5	-	-	-	-	F	10	15	15		X		Hillside
S-94	29° 44.051'	98° 07.985'	CD	5	Kep	50	150	5	-	-	-	-	N/F	10	15	15			X	Floodplain
S-95	29° 44.456'	98° 08.434'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Floodplain
S-96	29° 44.476'	98° 08.563'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Floodplain
S-97	29° 44.538'	98° 08.649'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-98	29° 44.540'	98° 08.710'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-99	29° 44.506'	98° 08.731'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-100	29° 44.416'	98° 08.732'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed

* DATUM 1927 North American Datum (NAD27) Date May 9, 2017 Sheet 4 of 7

GEOLOGIC ASSESSMENT TABLE — PROJECT NAME: The Veramendi Subdivision — FGS-E10139

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1	2*	3*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT²)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						< 40	≥ 40	<1.6	≥1.6	
S-101	29° 44.416'	98° 08.732'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-102	29° 44.230'	98° 08.773'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-103	29° 44.188'	98° 08.802'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-104	29° 44.167'	98° 08.857'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-105	29° 44.162'	98° 08.946'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-106	29° 44.156'	98° 09.033'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-107	29° 44.152'	98° 09.118'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-108	29° 44.185'	98° 09.217'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37			X	Streambed
S-109	29° 44.449'	98° 09.285'	SH	20	Kep	5	10	1	-	-	-	-	F	12	32	32		X		Hillside
S-110	29° 44.393'	98° 09.229'	O[FR]	5	Kep	20	40	-	N 45°	10	1 / 1	0.08	N/C	25	40		40		X	Streambed
S-111	29° 44.391'	98° 09.183'	O[FR]	5	Kep	20	150	-	N 40°	10	1 / 1	0.08	N/C	25	40		40		X	Streambed
S-112	29° 44.388'	98° 09.129'	O[VR]	5	Kep	4	300	-	-	-	3 / 1	0.06	N/C	20	25	25			X	Floodplain
S-113	29° 44.425'	98° 09.202'	SC	20	Kep	0.75	1	2.5	-	-	-	-	O/F	15	35	35		X		Hillside
S-114	29° 44.409'	98° 08.986'	SH	20	Kep	10	12	1	-	-	-	-	F	12	32	32		X		Hillside
S-115	29° 44.570'	98° 09.098'	MB	30	Kep	0.75	0.75	?	-	-	-	-	N	35	65		65	X		Hillside
S-116	29° 44.270'	98° 09.232'	SC[H]	20	Kep	1	1	3	-	-	-	-	F	12	32	32		X		Hillside
S-117	29° 44.351'	98° 09.339'	MB	30	Kep	30	50	6	-	-	-	-	N	15	45		45		X	Streambed
S-118	29° 44.265'	98° 09.030'	CDZ	5	Kep	300	1000	-	-	-	-	-	F	10	15	15			X	Floodplain
S-119	29° 44.168'	98° 09.619'	MB	30	Kep	3	75	3	-	-	-	-	C	15	45		45		X	Streambed
S-120	29° 44.242'	98° 08.913'	O[FR]	5	Kep	40	350	-	N 50°	10	1 / 2	0.08	C	25	40		40		X	Streambed
S-121	29° 44.629'	98° 09.090'	SC	20	Kep	2	2	1.5	-	-	-	-	F	12	32	32		X		Hillside
S-122	29° 44.743'	98° 08.887'	CD	5	Kep	30	70	4	-	-	-	-	F	10	15	15			X	Drainage
S-123	29° 44.660'	98° 08.712'	O[FR]	5	Kep	50	150	-	N 70°	-	1 / 2	0.08	F	20	25	25			X	Streambed
S-124	29° 44.675'	98° 08.695'	CD	5	Kep	80	170	8	-	-	-	-	F	10	15	15			X	Hillside
S-125	29° 44.127'	98° 09.046'	SC	20	Kep	2	3	1	-	-	-	-	F	12	32	32			X	Floodplain

* DATUM 1927 North American Datum (NAD27) Date May 9, 2017 Sheet 5 of 7

GEOLOGIC ASSESSMENT TABLE — PROJECT NAME: The Veramendi Subdivision — FGS-EI0139

LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
1	2*	3*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT²)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						< 40	≥ 40	<1.6	≥1.6	
S-126	29° 44.557'	98° 08.645'	SCZ	20	Kep	30	600	-	-	-	-	-	C/N	15	35	35			X	Floodplain
S-127	29° 44.821'	98° 08.588'	MB	30	Kep	0.75	0.75	?	-	-	-	-	N	35	65		65	X	X	Hilltop
S-128	29° 44.670'	98° 08.013'	CD	5	Kep	60	65	4	-	-	-	-	F	10	15	15			X	Hillside
S-129	29° 44.659'	98° 07.996'	MB	30	Kep	0.75	0.75	?	-	-	-	-	N	35	65		65	X		Hilltop
S-130	29° 44.656'	98° 07.991'	MB	30	Kep	0.75	0.75	?	-	-	-	-	N	35	65		65	X		Hilltop
S-131	29° 44.338'	98° 07.805'	CD	5	Kep	70	90	3	-	-	-	-	F	10	15	15			X	Hillside
S-132	29° 44.382'	98° 07.502'	CD	5	Kep	20	70	3	-	-	-	-	F	10	15	15			X	Hillside
S-133	29° 45.186'	98° 08.255'	OFR	5	Kep	40	100	-	N 65°	-	1 / 2	0.08	N	20	25	25			X	Drainage
S-134	29° 44.881'	98° 07.761'	OFR	5	Kep	30	100	-	N 40°	10	1 / 2	0.08	N	20	35	35			X	Drainage
S-135	29° 44.916'	98° 07.704'	OFR	5	Kep	40	60	-	N 140°	-	1 / 2	0.08	N	20	25	25			X	Drainage
S-136	29° 44.580'	98° 07.125'	OFR	5	Kep	15	20	-	N 7°	-	1 / 2	0.08	N	20	25	25			X	Drainage
S-137	29° 44.336'	98° 07.793'	MB	30	Kep	0.75	0.75	?	-	-	-	-	N	35	65		65	X		Hillside

* DATUM 1927 North American Datum (NAD27)

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

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

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

I have read, I understood and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field. My signature certifies that I am qualified as a geologist as defined by 30 TAC 213.

STATE OF TEXAS — Steve M. Frost — Geology — License No. 315 — LICENSED PROFESSIONAL GEOSCIENTIST

Signature _____ Date May 9, 2017 Sheet 6 of 7

GEOLOGIC ASSESSMENT TABLE — PROJECT NAME: The Veramendi Subdivision — FGS-E10139

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1	2*	3*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT²)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						< 40	≥ 40	<1.6	>1.6	
S-138	29° 44.382'	98° 07.687'	SH	20	Kep	30	40	2		-	-	-	F	15	35	35		X		Hillside
S-139	29° 44.661'	98° 07.779'	O[FR]	5	Kep	8	10	-	N 70°	-	1 / 2	0.08	C/F	15	20	20		X		Hillside
S-140	29° 45.001'	98° 08.094'	SC	20	Kep	2	4	2	-	-	-	-	O/F	12	32	32		X		Hillside
S-141	29° 45.176'	98° 08.164'	SC	20	Kep	0.25	2.5	2	-	-	-	-	O/F	12	32	32		X		Hillside
S-142	29° 43.319'	98° 09.171'	SH	20	Kep	100	150	4	-	-	-	-	F	15	35	35			X	Hillside
S-143	29° 44.622'	98° 07.369'	SCZ	20	Kep	30	2,800	-	-	-	-	-	N/O	12	32	32			X	Cliff
S-144	29° 45.163'	98° 08.014'	SCZ	20	Kep	30	3,600	-	-	-	-	-	N/O	12	32	32			X	Cliff
S-145	29° 44.287'	98° 09.495'	CDZ	30	Kep	600	1,000	-	-	-	-	-	O/F	30	60		60		X	Streambed
S-146	29° 44.969'	98° 08.534'	F	20	Kep	-	-	-	N 55°	-	-	-	-	15	35	35			X	Hillside
S-147	29° 45.017'	98° 08.031'	F	20	Kep	-	-	-	N 45°	-	-	-	-	15	35	35			X	Hillside
S-148	29° 43.175'	98° 09.430'	MB	30	Kep	3	3	?	-	-	-	-	X	7	37	37		X		Hillside

* DATUM 1927 North American Datum (NAD27)

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

8A INFILLING

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

12 TOPOGRAPHY

Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field. My signature certifies that I am qualified as a geologist as defined by 30 TAC 213.

STATE OF TEXAS — Steve M. Frost — Geology — License No. 315 — LICENSED PROFESSIONAL GEOSCIENTIST

Signature Steve Frost Date May 9, 2017 Sheet 7 of 7

LOCATION

The project site consists of approximately 2,400 acres of land located along and north of Loop 337 and east and west of River Road 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 Edwards Aquifer Recharge Zone Map, the Flood Insurance Rate Map (FIRM), a 1973 aerial photograph from the USDA at a scale of 1"=2000', a geologic map, a 2010 aerial photograph at a scale of 1"=2000', and a 2010 aerial photograph at a scale of 1"=500M, 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 and several employees of Frost GeoSciences, Inc. including Ms. TG Bey, Biologist, Mr. Reza Eshmaly, Geologist, James Akers, and Spencer Templen. 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 2010 aerial photograph, in conjunction with a hand held Garmin eTrex Summit Global Positioning System with an Estimated Potential Error ranging from 7 to 12 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 on the Site Geologic Map in Appendix C of this report. A copy of a 2010 aerial photograph at an approximate scale of 1"=500M, 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 1-11 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), New Braunfels East, Texas Sheet (1994), Sattler, Texas Sheet (1994), and Hunter, Texas Sheet (1994), the elevation of the project site ranges from 630 feet at the eastern corner of the project site within the River Pasture along the Guadalupe River to 845 feet along the western property lines of Pastures 1 and 3. These elevations are calculated above mean sea level (AMSL). A landing strip and a stock pond are noted within Pasture 1. A residential structure and several associated barns and sheds are visible near the northern limits of Pasture 1. Two stock ponds were noted within Pasture 2. One stock pond and a spillway for a flood control dam was noted within Pasture 3. The surface runoff from the project site flows into unnamed tributaries of Blieders Creek, Blieders Creek, unnamed tributaries of the Guadalupe River, and the Guadalupe River. State Highway 46 (Loop 337) is located immediately south of the project site. River Road separates Pastures 2 and 4 to the west from the River Pasture to the east. 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 Official Edwards Aquifer Recharge Zone Map, New Braunfels West, Texas Sheet, New Braunfels East, Texas Sheet, Sattler, Texas Sheet, and Hunter, Texas Sheet, (1996),

the project site is located within the Recharge Zone of the Edwards Aquifer. A copy of the Official Edwards Aquifer Recharge Zone Map, 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 48091C0270F, 48091C0290F, 48091C0435F, & 48029C0455F (Revised 9/02/09) were reviewed to determine if the project site is located in areas prone to flooding. A review of the above-mentioned panels indicate that portions of the project site is located within the 100 year floodplain. The project site is located within Zone AE, Zone A, Zone X Shaded, and Zone X.

According to the panel legend, Zone AE represents areas within the 100 year floodplain where base flood elevations have been determined. The areas of the property within Zone AE are generally located along Blieders Creek and the Guadalupe River.

Zone A represents areas within the 100 year flooplain where base flood elevations have not been determined. The areas of the property within Zone A are generally areas along tributaries immediately upgradient of areas determined to be within Zone AE.

Zone X shaded represents areas of 0.2% annual chance of flooding, areas of 1% annual chance of flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% annual chance of flooding. The areas of the property with Zone X Shaded are generally narrow bands located immediately adjacent to areas determined to be within Zone AE.

Zone X represents areas determined to be outside the 0.2% annual chance floodplain. 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 Rumple-Comfort Association (RUD), the Comfort - Rock Outcrop Complex, Undulating (CrD), the Brackett - Rock Outcrop - Comfort Complex, Undulating (BtD), the Lewisville Silty Clay, 1 to 3 percent slopes (LeB), the Medlin-Eckrant Association (MEC/MED), and the Orif Soils, Frequently Flooded (Or). A copy of the 1973 aerial photograph (approximate scale: 1"=2000') from the USDA Soil Survey of Comal & Hays County, Texas (1982) indicating the location of the project site and the soil types is included on Plate 6 in Appendix A.

The Rumple-Comfort Association (RuD) consists of shallow and moderately deep soils on uplands in the Edwards Plateau Land Resource Area. The surface layer of the Rumple Soil is dark reddish brown very cherty clay loam about 10 inches thick. Rounded chert and limestone cobbles and gravel cover about 20 percent of the surface. The subsoil to a depth of 14 inches is dark reddish-brown very cherty clay, and to a depth of 28 inches it is dark reddish-brown extremely stony clay. The underlying material is indurated fractured limestone. The Comfort Soil is dark brown, neutral, extremely stony clay about 7 inches thick. The subsoil to a depth of 12 inches is dark reddish-brown, mildly alkaline, extremely stony clay. The underlying material is indurated fractured limestone. The soil is noncalcareous throughout. The soils in this association are well drained. Surface runoff is medium, but varies due to the occurrence of caves, fracture zones, and sinks. Permeability is moderately slow. Water erosion is a moderate hazard.

The Comfort-Rock Outcrop Complex consists of shallow, clayey soils and Rock Outcrop on side slopes and on hilltops and ridgetops on uplands in the Edwards Plateau Land Resource Area. The Comfort Extremely Stony Clay makes up 49 to more than 95 percent of the complex, but on the average it makes up 70 percent. Rock Outcrop and areas of soil less than 4 inches deep make up 5 to 36 percent, but the average is 15 percent. Typically, the surface layer of the Comfort soil is dark brown extremely stony clay about 6 inches thick. Cobbles and stones as much as 4 feet across cover about 45 percent of the surface. The subsoil extends to a depth of 13

inches. It is dark reddish brown extremely stony clay. The underlying material is indurated fractured limestone. The soil is mildly alkaline and noncalcareous throughout. The Comfort 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. This soil has a USDA Texture Classification of extremely stony clay, stony clay, very stony clay, and weathered bedrock. The Unified Classification is CH, GC, CL, or SC. The AASHO Classification is A-2-7, and A-7-6. This soil has an average permeability from 0.6 to 0.2 inches/hour.

The Brackett-Rock Outcrop-Comfort Complex consists of shallow, loamy and clayey soils and rock outcrops on uplands in the Edwards Plateau Land Resource Area. The Brackett Soil makes up 30 to 60 percent of the complex, but on the average it makes up 50 percent. Rock Outcrops make up 10 to 40 percent of the complex, but the average is 20 percent. The Comfort Soil makes up 10 to 20 percent, but the average is 15 percent. Typically, the surface layer of the Brackett Soil is grayish brown gravelly clay loam about 6 inches thick. The subsoil extends to a depth of 17 inches. It is very pale brown and pale yellow gravelly clay loam. The underlying material is weakly cemented limestone interbedded with thin layers of indurated limestone. The soil is moderately alkaline and calcareous throughout. Typically, the areas of Rock Outcrop consist of exposures of limestone bedrock. There is some soil material in the narrow fractures in the rock. In some areas, however, the rock is flat and is covered by soil material as much as 3 inches thick. Typically, the surface layer of the Comfort Soil is dark brown extremely stony clay about 4 inches thick. The subsoil extends to a depth of 11 inches. It is dark reddish brown extremely stony clay. The underlying material is indurated fractured limestone. The soil is moderately alkaline and noncalcareous throughout. The soils in this complex are well drained. Surface runoff is medium to rapid. Permeability is moderately slow in the Brackett Soil and slow in the Comfort Soil. The available water capacity is very low. Water erosion is a severe hazard.

The Lewisville Silty Clay consists of 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 33 inches

is light brown silty clay, and to a depth of 63 inches is reddish yellow silty clay. The soil is moderately alkaline and calcareous throughout. This soil is well drained, surface runoff is medium, and permeability is moderate.

The Medlin-Eckrant Association consists of very shallow to shallow and deep soils on uplands in the Edwards Plateau Land Resource Area. There are narrow limestone ledges at the top of some slopes. The Medlin and Eckrant soils each make up 20 to 80 of a mapped area. Together, on the average, they make up about 95 percent of the mapped area. A typical area is 50 percent Medlin soil and 45 percent Eckrant soil. Typically, the Medlin soil has a grayish brown surface layer about 11 inches thick that is stony clay in the upper part and clay in the lower part. The subsoil, from 11 to 50 inches, is light yellowish brown clay that has yellowish brown and olive yellow mottles. The underlying material to a depth of 80 inches is light gray shaly clay that has yellow and olive yellow mottles. The soil is moderately alkaline and calcareous throughout. The Medlin soils is well drained. Surface runoff is rapid. Permeability is very slow. Water enters rapidly when the soil is dry and cracked and very slow when it is wet. Water erosion is a severe hazard. Typically, the surface layer of the Eckrant soil is very dark gray extremely stony clay about 16 inches thick. The underlying material is fractured limestone bedrock. The soil is moderately alkaline and noncalcareous throughout. The Eckrant soil is well drained. Surface runoff is rapid. Permeability is moderately slow. Water erosion is a severe hazard.

The Orif Soils, Frequently Flooded consist of deep nearly level soils on flood plains of large creeks and rivers. These soils are adjacent to the stream channels. Typically, the surface layer is grayish brown moderately alkaline gravelly loamy sand about 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 of very brief duration. Floodwaters are swift and destructive. Surface runoff is slow, permeability is rapid.

Narrative Description of the Site Geology

The project site consists of approximately 2,400 acres of land located along and north of Loop 337 and east and west of River Road in New Braunfels, Texas. An overall view of the area is shown on Plates 1 through 9 in Appendix A. The project site exists as ranch land used to graze cattle and is the main ranching operation for the Word-Borchers Ranch. The project site has a very well developed soil layer on the property giving way to relatively few rock outcrops and dense stands of native grasses. Frost GeoSciences, Inc. after finding large piles of bulldozed rubble within 40 year old stands of trees, researched historic aerial photography and made note that the property appears to have undergone numerous episodes of land clearing dating back at least 40 to 50 years. These historic land clearing operations appear to have culled much of the rock rubble from the surface. The majority (80+%) of the 2,400 acre ranch appears to have been bulldozed at some point with many areas having been cleared repeatedly. This clearing process has produced many small non karst closed depressions resulting from pulling trees out and plucking boulders. There are so many of these across the property that it is not practical to itemize them within this report. The areas that have not been cleared historically appear to be along steep slopes and cliffs, and within major drainage areas. The majority of the site appears to support a thick soil cover and as a result very few potential recharge features were encountered when compared to the size of the property.

The variations in the vegetative cover across the project site are visible in the 2010 aerial photographs on Plates 8 and 9 in Appendix A and in the site visit photographs included in Appendix B. One hundred and forty eight Potential Recharge Features (PRF's) were identified during our site inspection. Nineteen of these are considered sensitive by Frost GeoSciences, Inc. The sensitive features are highlighted on the Geologic Assessment Tables on pages 4 through 10.

Non-Karst Closed Depressions (CD)

Potential Recharge Features S-1, S-2, S-10, S-14, S-22, S-57, S-58, S-87, S-90, S-93, and S-118, consist of notable non-karst closed depressions created by historic bulldozing on the property. These

features are typical of the thousands of similar features and appear to have been created by either the removal of trees or the plucking of boulders. Typically these feature are relatively small (less than 10 feet in any dimension and usually only a foot or two deep. Potential Recharge Features S-9, S-30, S-42, S-79, S-122, S-124, S-128, S-131, and S-132 are non-karst closed depressions consisting of excavated stock ponds used to water livestock, These features vary greatly in both size and shape, however, all of these features show evidence of ponding water for prolonged periods of time. PRF's S-9 and S-124 were holding water at the time of our site inspections. Potential Recharge Feature S-94 is a non-karst closed depression consisting of a stream scour adjacent to Blieders Creek. The bottoms of all of these features are lined with clay and show evidence of holding water. These 22 features are not considered sensitive by FGS. These features score a 15 on the Geologic Assessment Table.

Potential Recharge Feature S-145 consists of large non-karst closed depression created behind the Flood Control Dam within Pasture 3. This non-karst closed depression showed evidence of rapid infiltration into the subsurface after several heavy rainfall events during June and September. Due to the overall size of this feature and the rate that the feature drains into the subsurface, additional points were added for a ZONE rating. This feature is considered sensitive by FGS. This feature scores a 60 on the Geologic Assessment Table.

Manmade Features in Bedrock (MB)

Potential Recharge Features S-4 through S-8, S-11, S-15 through S-21, S-24 through S-26, S-28, S-32 through S-37, S-43, S47, S-48, S-50, S-53, S-55, S-56, S-59 through S-63, S-65 through S-68, S-71, S-72, S-75, S-76, S-80 through S-86, S-95 through S-108, and S-148 are manmade features in bedrock consisting of sanitary sewer manholes along two sewer outfall lines. The two sewer outfall lines combine within Blieders Creek at Potential Recharge Feature S-67. These 64 features are not considered sensitive by FGS. These features score a 37 on the Geologic Assessment Table.

Potential Recharge Features S-29, S-40, S-41, S-78, S-115, S-127, S-129, S-130, and S-137

consist of existing or recently drilled water wells. PRF's S-40 and S-127 are operational and in use at this time. PRF's S-29, S-78, and S-129 are wells associated with old windmills and do not appear to be operational at this time. The remaining PRF's are recently drilled wells consisting of open holes with no casing. These appear to be associated with either testing the groundwater availability or are planned as future water supply wells for livestock. These 9 features are considered sensitive by FGS. These features score a 65 on the Geologic Assessment Table.

Potential Recharge Feature S-39 consists of an area that had been excavated down to bedrock and used as quarry materials for roads on the ranch. This feature is not considered sensitive by FGS. This feature scores a 34 on the Geologic Assessment Table.

Potential Recharge Feature S-45 consists of an area of limestone cobbles and boulders. It is believed that the cobbles and boulders were the left over spoils from the excavation of a nearby sanitary sewer lift station. This feature is not considered sensitive by FGS. This feature scores a 37 on the Geologic Assessment Table.

Potential Recharge Feature S-46 consists of an old abandoned sanitary sewer lift station. The lift station was abandoned after the remaining sewer outfall line was constructed. This feature is not considered sensitive by FGS. This feature scores a 37 on the Geologic Assessment Table.

Potential Recharge Features S-51 and S-119 consist of areas along existing sewer lines that occur within stream channels where the scour of the stream has eroded compacted material out of the sewer trench. The scour at PRF S-51 also occurs in conjunction with an area of highly weathered and altered limestone increasing the probability of rapid infiltration into the subsurface. These 2 features are considered sensitive by FGS. These features score a 45 and 55 respectively on the Geologic Assessment Table.

Potential Recharge Feature S-117 consists of a large erosion scour located at the discharge pipe for the flood control dam along Blieders Creek. This feature was inspected after heavy rains in September and did not show evidence of standing water. This feature is considered sensitive by FGS. This feature scores a 45 on the Geologic Assessment Table.

Cave (C)

Potential Recharge Feature S-64 consists of a relatively small cave located near a hilltop in Pasture 2. The cave opening is approximately 2 feet wide and 3 feet long and has an initial drop of approximately 5 feet. An area of stressed vegetation around the cave opening indicated that the air inside the cave may not be suitable for long term or even short term occupation so no attempt was made to investigate the interior of the cave beyond what could be seen from the surface. A deflated area approximately 30 feet wide, 50 feet long and 3 feet deep was noted around the cave entrance. This is likely the result of soil erosion into the cave. This feature is considered sensitive by FGS. This feature scores a 60 on the Geologic Assessment Table.

Solution Cavity (SC)

Potential Recharge Features S-3, S-12, S-13, S-23, S-27, S-31, S-44, S-69, S-73, S-74, S-88, S-113, S-116, S-121, S-125, S-140, and S-141 consist of solution cavities of various dimensions. A machete was used to probe the depth of the features and determine the nature of the infilling. These cavities all contained a hard clay plug preventing rapid infiltration of water into the subsurface. This was somewhat expected given the extensive soil development across the property. These 17 features are not considered sensitive by FGS. These features score a 29 to 35 on the Geologic Assessment Table.

Potential Recharge Feature S-38 consists of an area of dissolved and scoured limestone outcrop associated with the spillway for the flood control dam. Some of the scours and dissolved limestone extended 3 to 4 feet down and none were noted holding water, even after periods of heavy rains, indicating rapid infiltration into the subsurface. This feature is considered sensitive by FGS. This feature scores a 50 on the Geologic Assessment Table.

Potential Recharge Features S-54, S-126, S-143, and S-144 consists of zones of solution cavities within cliff faces. These represent horizontal features that trend upgradient as they extend into the bedrock cliff. FGS is of the opinion that these features represent discharge features associated with the outlets of subsurface bedding plain features. These 4 features are not considered sensitive by FGS. These features score between a 32 and 37 on the Geologic Assessment Table.

Sinkhole (SH)

Potential Recharge Features S-77 consists of three small closed depressions (sinkholes) likely resulting from soil deflation within a 100 X 100 foot area and two caves approximately 100 feet apart within the same area. The depressions were infilled with loose soil and leaves, rock rubble and some hard packed clay in areas. Evidence of rapid infiltration into the subsurface was noted in some areas. These features are considered sensitive by FGS. These features score a 65 on the Geologic Assessment Table.

Potential Recharge Features S-92, S-109, S-114, S-138, and S-142 consists of areas believed to be the result of soil deflation into the subsurface creating karst formed closed depressions or sinkholes. For these purposes, it is not believed by FGS that these are sinkholes in the classic sense that a collapse has occurred creating a depression. Rather, FGS believes these features are purely the result of erosion of surface soils into subsurface features. These features all contained small areas in the bottoms with no grasses indicating that water ponds for prolonged periods of time. As a result, it did not appear that these features provide rapid infiltration into the subsurface. These 5 features are not considered sensitive by FGS. These features score a 32 to 39 on the Geologic Assessment Table.

Fault (F)

Potential Recharge Features S-146 and S-147 consist of faults noted on the Bureau of Economic Geology, Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle (2000). Evidence of PRF S-146 was somewhat confirmed in the field with fractures noted at PRF S-133, however, the bearings of the fractures were not the same as the strike of the proposed fault. No fractures or other field evidence associated with PRF S-147 were noted in the field at the time of the on-site inspection. These 2 features are not considered sensitive by FGS. These features score a 35 on the Geologic Assessment Table.

Other Natural Bedrock Feature (O)

Potential Recharge Features S-49, S-52, S-70, S-91, S-112, S-123, S-133, S-134, S-135, S-136, and S-139 consist of natural rock outcrops with either vuggy limestone (O^{VR}) or fractured bedrock (O^{FR}). The

sizes of these outcrops and the strike of the fractures varied greatly. These 11 features are not considered sensitive by FGS. These features score a 14 to 35 on the Geologic Assessment Table.

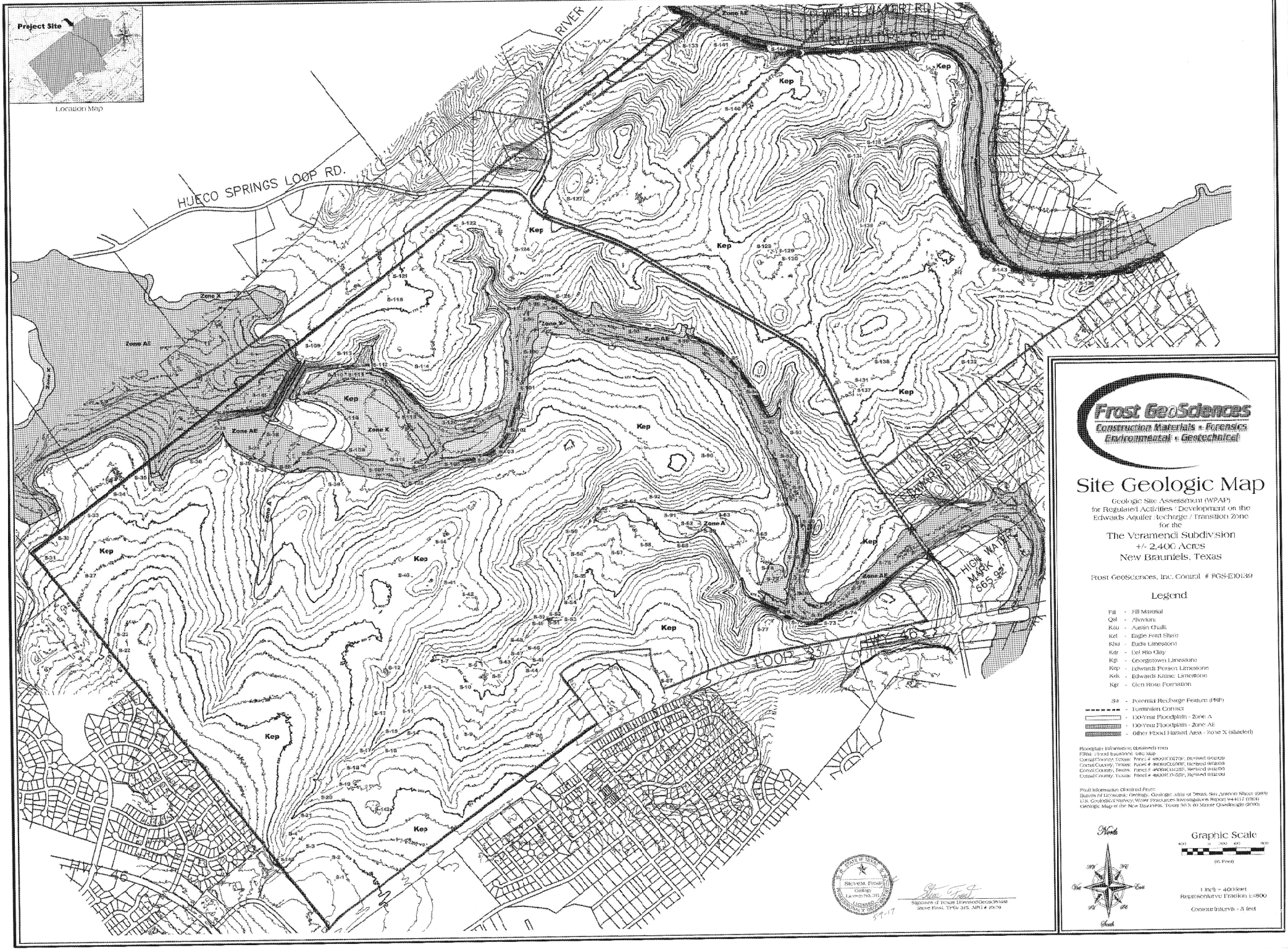
Potential Recharge Features S-110, S-111, and S-120 consist of natural rock outcrops with fractured bedrock (O^{FR}). The sizes of these outcrops and the strike of the fractures varied greatly. These 3 features are considered sensitive by FGS. These features score a 40 on the Geologic Assessment Table.

According to the USGS 7.5 Minute Quadrangle Maps, New Braunfels West, Texas Sheet (1988), New Braunfels East, Texas Sheet (1994), Sattler, Texas Sheet (1994), and Hunter, Texas Sheet (1994), the elevation of the project site ranges from 630 feet at the eastern corner of the project site within the River Pasture along the Guadalupe River to 845 feet along the western property lines of Pastures 1 and 3. These elevations are calculated above mean sea level (AMSL). According to topographic data obtained from Pape Dawson Engineers, the elevations on the project site range from 625 feet at the eastern corner of the project site to 845 feet along the western property lines of Pastures 1 and 3. A copy of the site plan, indicating the boundary of the project site and the elevations, is included on Plate 1 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.

The Cyclic and Marine Member of the Cretaceous Edwards Person Limestone consists of mudstone to packstone and miliolid grainstone with chert. The member is characterized by massive beds of limestone to relatively thin beds of limestone with some crossbedding. The Cyclic and Marine Member forms a few caves some that are laterally extensive. Overall thickness ranges from 80 to 90 feet thick.

The Leached and Collapsed Member of the Edwards Person Limestone consists of crystalline limestone, mudstone to grainstone with chert, and collapsed breccia. This member


Project Site
Location Map
HUECO SPRINGS LOOP RD.
GUADALUPE RIVER
Kep
Zone AE
Zone X
Zone A
HIGH WATER MARK 665.92'
LOOP 337
HWY 46
Frost GeoSciences
Construction Materials • Forensics
Environmental • Geotechnical
Site Geologic Map
Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
for the
The Veramendi Subdivision
+/- 2,406 Acres
New Braunfels, Texas
Frost GeoSciences, Inc. Control # FGS-E10139
Legend
Fill - Fill Material
Qal - Alluvium
Kau - Austin Chalk
Ket - 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
Sz - 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 # 48091C0270F, Revised 9/2/09
Comal County, Texas: Panel # 48091C0260E, Revised 9/2/09
Comal County, Texas: Panel # 48091C0255F, Revised 9/2/09
Comal County, Texas: Panel # 48091C0510D, Revised 9/2/09
Fault Information Obtained From:
Bureau of Economic Geology, Geologic Atlas of Texas, San Antonio Sheet (1981)
U.S. Geological Survey, Water Resources Investigations Report 94-4117 (1994)
Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle (2000)
Graphic Scale
(In Feet)
North
1 Inch = 400 feet
Representative Fraction 1:4800
Contour Interval - 5 feet
Steven M. Frost
Geologist
License No. 315
Signature of Texas Licensed Geoscientist
Steve Frost, TPGS 315, API # 6078
5-9-17

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 S8-S10

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: 355 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: Jocelyn Perez ,P.E.
   Texas Licensed Professional Engineer's Number: 98367
   Entity: Pape-Dawson Engineers
   Mailing Address: 1672 Independence Dr, Ste. 102
   City, State:New Braunfels, TX Zip: 78132
   Telephone:(830) 632-5633 Fax:_____
   Email Address:jperez@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:

   _____% Domestic _____ gallons/day
   _____% Industrial _____ gallons/day
   _____% Commingled _____ gallons/day

   Total gallons/day: N/A

6. Existing and anticipated infiltration/inflow is 750 gpd/acre 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

Pipe Diameter(Inches)	*Linear Feet (1)*	*Pipe Material (2)*	*Specifications (3)*
8" Gravity (NR)	3095.36	PVC SDR 26	ASTM D3034, ASTM D3212
8" Gravity (PR)	446.75	PVC SDR 26	ASTM 2241, ASTM D3139, ASTM C1173
12" Gravity (NR)	1106.18	PVC SDR 26	ASTM D3034, ASTM D3212
12" Gravity (PR)	20	PVC SDR 26	ASTM 2241, ASTM D3139, ASTM C1173

Total Linear Feet: 4668.29'

(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 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

Line	*Shown on Sheet*	*Station*	*Manhole or Clean-out?*
A	C1.06 Of	56+68.29	M.H. A16
	Of		
	Of		

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

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

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

Pipe Diameter (inches)	Max. Manhole Spacing (feet)
6 - 15	500
16 - 30	800
36 - 48	1000
≥54	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" = 400'.

19. ☒ The Site Plan must include the sewage collection system general layout, including manholes with station numbers, and sewer pipe stub outs (if any). Site plan must be overlain by topographic contour lines, using a contour interval of not greater than ten

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

20. Lateral stub-outs:

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

21. Location of existing and proposed water lines:

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

22. 100-year floodplain:

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

Table 3 - 100-Year Floodplain

Line	*Sheet*	*Station*
	of	to
	of	to
	of	to
	of	to

23. 5-year floodplain:

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

Table 4 - 5-Year Floodplain

Line	*Sheet*	*Station*
	of	to
	of	to

Line	*Sheet*	*Station*
	of	to
	of	to

24. ☒ Legal boundaries of the site are shown.

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

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

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

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

Table 5 - Water Line Crossings

Line	*Station or Closest Point*	*Crossing or Parallel*	*Horizontal Separation Distance*	*Vertical Separation Distance*
A	10+29.61	Crossing		2.20'
A	56+43.50	Crossing		7.08'

27. Vented Manholes:

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

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

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

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

Table 6 - Vented Manholes

Line	*Manhole*	*Station*	*Sheet*
A	M.H A2 (VENTED)	11+98.81	C1.02
A	M.H. A5 (VENTED)	18+46.69	C1.02
A	M.H. A8 (VENTED)	27+39.13	C1.03
A	M.H. A10 (VENTED)	35+92.21	C1.04
A	M.H. A12 (VENTED)	42+30.61	C1.05
A	M.H A14 (VENTED)	50+61.72	C1.06
A	M.H. A16 (VENTED)	56+68.29	C1.06

28. Drop manholes:

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

Table 7 - Drop Manholes

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

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

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

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

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

31. Minimum flow velocity (From Appendix A)

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

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

☒ Assuming pipes are flowing full, all slopes are designed to produce maximum flows of less than or equal to 10 feet per second for this system/line.

☐ **Attachment D – Calculations for Slopes for Flows Greater Than 10.0 Feet per Second.** Assuming pipes are flowing full, some slopes produce flows which are greater than 10 feet per second. These locations are listed in the table below. Calculations are attached.

Table 8 - Flows Greater Than 10 Feet per Second

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

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

☐ Concrete encasement shown on appropriate Plan and Profile sheets for the locations listed in the table above.

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

☒ N/A

Administrative Information

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

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

Table 9 - Standard Details

Standard Details	*Shown on Sheet*
Lateral stub-out marking **[Required]**	C1.20 of
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) **[Required]**	C1.20 of
Alternate method of joining lateral to existing SCS line for potential future connections **[Required]**	C1.20 of
Typical trench cross-sections **[Required]**	C1.20 of
Bolted manholes **[Required]**	C1.20 of
Sewer Service lateral standard details **[Required]**	C1.20 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]**	C1.00 of
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) **[Required, if Flexible Pipe is used]**	C1.20 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 visit

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.

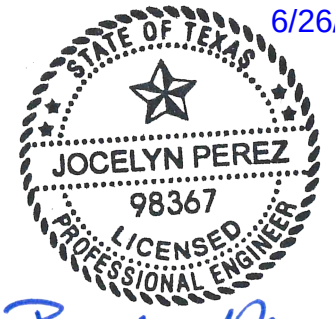
Signature

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: Jocelyn Perez, P.E.

Date: 6/26/2024 6/26/2024

Place engineer's seal here:



Signature of Licensed Professional Engineer:

Appendix A-Flow Velocity Table

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

Table 10 - Slope Velocity

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

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

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

Figure 1 - Manning's Formula

Where:

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

ATTACHMENT A
(Engineering Design Report)

VERAMENDI S8-S10
Engineering Design Report
8”, 12” PVC SDR 26

TABLE OF CONTENTS

VERAMENDI S8-S10
Engineering Design Report
8", 12" PVC SDR 26

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 S8-S10 is a ± 4669 LF sewer line within the city of New Braunfels ETJ in Comal County, Texas. The site is located approximately 0.3 miles NW of the intersection of Borchers Blvd and Loop 337. The site is currently undeveloped, lies within the Blieders Creek watershed, and does not contain 100-year floodplain.

This Sewage Collection System (SCS) Application proposes the construction of a total of approximately 4668.29 linear feet (LF) of sanitary sewer main to serve the proposed developments over the Edwards Aquifer Recharge Zone. The proposed alignment will consist of approximately 3095.35 linear feet (LF) of 8-inch (8") polyvinyl chloride (PVC), SDR 26 gravity sewer main, 1106.18 linear feet (LF) of 12-inch (12") polyvinyl chloride (PVC), SDR 26 gravity sewer main, 446.75 linear feet (LF) of 8-inch (8") PVC, SDR 26 160-psi pressure rated sewer main, and 20 linear feet (LF) of 12-inch (12") PVC, SDR 26 160-psi pressure rated sewer main centered at water line crossings, see included plan and profile exhibits for details. Regulated activities proposed include excavation, construction of sewer mains, manholes, backfill, and compaction. Approximately 10.9 acres may be disturbed as identified by the limits of the fifty foot (50') SCS/GA envelope shown on the plans.

This project will add approximately 1634 Living Unit Equivalents (LUEs) upon completion of ultimate build out. No Stub-outs are proposed with this SCS as this will complete this phase of the development.

Any future sewage flow will be disposed of by conveyance to the existing Gruene Wastewater Treatment Center operated by the New Braunfels Utilities (NBU). Potable water will be supplied by NBU. One naturally occurring sensitive features was identified with the SCS envelope in the Geological Assessment.

Please refer to Sheets C1.00 and C1.01 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: ✓

Service Connections: _____

Land Area and Use: ✓

Fixture Analysis: _____

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: ***([18+(0.0206 x F)$^{0.5}$]/(4+(0.0206 x F)$^{0.5}$) x F***

F= 210 (gal/LUE/day) x (#LUE)/1440

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

Total 8" (NR & PR) LUEs = 498

1 LUE = 210 gallons per day (average sewage flow)

Avg. Daily Dry Weather Flow = *498 LUEs x (210 gpd/LUE) = 104,580 gpd =* ***72.63 gpm***

F= 210 (gal/LUE/day) x (498 LUE)/1440 = 72.63 gpm

Peak Dry Weather Flow = *([18+(0.0206 x 72.63)$^{0.5}$]/[4+(0.0206 x 72.63)$^{0.5}$]) x 72.63 =* ***267.30 gpm***

Infiltration = 750 gallons per acre served

Avg. Daily Wet Weather Flow = *72.63 gpm + [(750gpd/acre) x 120.74 acres]/1440 =* ***135.52 gpm***

Peak Wet Weather Flow = *267.30 gpm + [(750gpd/acre) x 120.74 acres]/1440 =* ***330.19 gpm***

Total 12" (NR & PR) LUEs = 1481

1 LUE = 210 gallons per day (average sewage flow)

Avg. Daily Dry Weather Flow = *1481 LUEs x (210 gpd/LUE) = 311,010 gpd =* ***215.98 gpm***

F= 210 (gal/LUE/day) x (1481 LUE)/1440 = 215.98 gpm

Peak Dry Weather Flow = *$([18+(0.0206 \times 215.98)^{0.5}]/[4+(0.0206 \times 215.98)^{0.5}]) \times 215.98 =$* ***710.92 gpm***

Infiltration = 750 gallons per acre served

Avg. Daily Wet Weather Flow = *215.98 gpm + [(750gpd/acre) x 272 acres]/1440 =* ***357.65 gpm***

Peak Wet Weather Flow = *710.92 gpm + [(750gpd/acre) x 272 acres]/1440 =* ***852.59 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 8" ASTM D3034, SDR 26, PVC Sewer Pipe:

Nominal Size = 8"

Outer Diameter (D_o) = 8.40"

Minimum Wall Thickness (t) = 0.323"

Inner Diameter (D_i) = 7.75"

Characteristics of 8" ASTM 2241, Class 160, SDR 26, PVC Sewer Pipe:

Nominal Size = 8"

Outer Diameter (D_o) = 8.625"

Minimum Wall Thickness (t) = 0.332"

Inner Diameter (D_i) = 7.961"

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

Nominal Size = 12"

Outer Diameter (D_o) = 12.50"

Minimum Wall Thickness (t) = 0.481"

Inner Diameter (D_i) = 11.538"

Characteristics of 12" ASTM 2241, Class 160, SDR 26, PVC Sewer Pipe:

Nominal Size = 12"

Outer Diameter (Do) = 12.75"

Minimum Wall Thickness (t) = 0.490"

Inner Diameter (Di) = 11.711"

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 (ft^2)

R = Hydraulic Radius (ft)

= A/P = Cross sectional area of flow (ft^2)/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 8" ASTM D3034, SDR 26, PVC Sewer Pipe:

$A = \pi(D_i^2)/4=\pi(7.754\ in)^2/4=47.17\ in^2=0.33\ ft^2$

$P = \pi(D_i)=\pi(7.754\ in)=24.35\ in=2.03\ ft$

$R = A/P = 0.33\ ft^2/2.03\ ft.=0.16\ ft$

$S = 0.0068$

$Q = [(1.49\ ft^{1/3}/sec)/0.013](0.33\ ft^2)(0.16\ ft)^{2/3}(0.0068)^{1/2}$

$Q = 0.92\ cfs = 413\ gpm = Q_{full}$

*$V = 0.92\ cfs/0.33\ ft^2$=**2.79 ft/s***

*Qmax at 90% of full flow capacity = 0.92 cfs (0.90)(7.48 gallons/1 cf)(60 sec/1 min.)=**372 gpm***

*Qmax at 85% of full flow capacity = 0.92 cfs (0.85)(7.48 gallons/1 cf)(60 sec/1 min.)=**351 gpm***

*Qmax at 65% of full flow capacity = 0.92 cfs (0.65)(7.48 gallons/1 cf)(60 sec/1 min.)=**269 gpm***

<u>Calculations for 8" ASTM 2241, Class 160, SDR 26, PVC Sewer Pipe:</u>

$A = \pi(D_i^2)/4=\pi(7.961\ in)^2/4=49.78\ in^2=0.35\ ft^2$

$P = \pi(D_i)=\pi(7.961\ in)=25.01\ in=2.08\ ft$

$R = A/P = 0.35\ ft^2/2.08\ ft.=0.17\ ft$

$S = 0.0068$

$Q = [(1.49\ ft^{1/3}/sec)/0.013](0.35\ ft^2)(0.17\ ft)^{2/3}(0.0068)^{1/2}$

$Q = 1.02\ cfs = 458\ gpm = Q_{full}$

*$V = 1.02\ cfs/0.35\ ft^2$=**2.92 ft/s***

*Qmax at 90% of full flow capacity = 1.02 cfs (0.90)(7.48 gallons/1 cf)(60 sec/1 min.)=**412 gpm***
*Qmax at 85% of full flow capacity = 1.02 cfs (0.85)(7.48 gallons/1 cf)(60 sec/1 min.)=**390 gpm***
*Qmax at 65% of full flow capacity = 1.02 cfs (0.65)(7.48 gallons/1 cf)(60 sec/1 min.)=**298 gpm***

<u>Calculations for 12" ASTM D3034, SDR 26, PVC Sewer Pipe:</u>

$A = \pi(D_i^2)/4=\pi(11.538\ in)^2/4=104.50\ in^2=0.73\ ft^2$

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

$R = A/P = 0.73\ ft^2/3.02\ ft.= 0.24\ ft$

$S = 0.0058$

$Q = [(1.49\ ft^{1/3}/sec)/0.013](0.73\ ft^2)(0.24\ ft)^{2/3}(0.0058)^{1/2}$

$Q = 2.46\ cfs = 1105\ gpm = Q_{full}$

*V = 2.46 cfs/0.73 ft^2=**3.37 ft/s***

*Qmax at 90% of full flow capacity = 2.46 cfs (0.90)(7.48 gallons/1 cf)(60 sec/1 min.)=**994 gpm***
*Qmax at 85% of full flow capacity = 2.46 cfs (0.85)(7.48 gallons/1 cf)(60 sec/1 min.)=**939 gpm***
*Qmax at 65% of full flow capacity = 2.46 cfs (0.65)(7.48 gallons/1 cf)(60 sec/1 min.)=**718 gpm***

Calculations for 12" ASTM 2241, Class 160, SDR 26, PVC Sewer Pipe:

A = π(11.711 in)^2/4= 107.7 in^2=0.748 ft^2

P = π(11.711 in)= 36.79 in=3.07 ft

R = A/P = 0.748 ft^2/3.07 ft=0.244 ft

S = 0.007

Q = [(1.49 ft$^{1/3}$/sec)/0.013](0.748 ft^2)(0.244 ft)$^{2/3}$(0.007)$^{1/2}$

Q = 2.80 cfs = 1257 gpm =Q_{full}

*v = 2.80 cfs/0.748 ft^2=**3.75 ft/s***

*Qmax at 90% of full flow capacity = 2.80 cfs (0.90)(7.48 gallons/1 cf)(60 sec/1 min.)=**1131 gpm***
*Qmax at 85% of full flow capacity = 2.80 cfs (0.85)(7.48 gallons/1 cf)(60 sec/1 min.)=**1069 gpm***
*Qmax at 65% of full flow capacity = 2.80 cfs (0.65)(7.48 gallons/1 cf)(60 sec/1 min.)=**817 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)	Qpeak (gpm)
8 (NR)	8.40	0.68	0.33	0.16	0.29	0.082	0.92	85	2.79	351	330.19
8 (PR)	8.625	0.68	0.35	0.17	0.31	0.082	1.02	85	2.92	390	330.19
8 (NR)	8.40	0.68	0.33	0.16	0.29	0.082	0.92	65	2.79	269	267.30
8 (PR)	8.625	0.68	0.35	0.17	0.31	0.082	1.02	65	2.92	298	267.30
8 (NR)	8.40	0.68	0.33	0.16	0.29	0.082	0.92	90	2.79	372	330.19
8 (PR)	8.625	0.68	0.35	0.17	0.31	0.082	1.02	90	2.92	412	330.19
12 (NR)	12.5	0.58	0.73	0.24	0.38	0.076	2.46	85	3.37	939	852.59
12 (PR)	12.75	0.70	0.748	0.24	0.39	0.084	2.80	85	3.75	1069	852.59
12 (NR)	12.5	0.58	0.73	0.24	0.38	0.076	2.46	65	3.37	718	710.92

12 (PR)	12.75	0.70	0.748	0.24	0.39	0.084	2.80	65	3.75	817	710.92
12 (NR)	12.5	0.58	0.73	0.24	0.38	0.076	2.46	90	3.37	994	852.59
12 (PR)	12.75	0.70	0.748	0.24	0.39	0.084	2.80	90	3.75	1131	852.59

Due to rounding all flow velocities will meet 2 fps requirement.

Conclusion

The proposed 8" (NR & PR) pipes at their respective minimum slope have sufficient capacity to convey the projected Peak Dry Weather and Peak Wet Weather flows under 65%, 85% and 90% respectively.

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
8	3095.36	*PVC SDR 26*	*ASTM D3034*	*ASTM D3212*
8 pressure rated	*446.75*	*PVC SDR 26*	*ASTM 2241, Class 160*	*ASTM D3139* *ASTM C1173*
12	*1106.18*	*PVC SDR 26*	*ASTM D3034*	*ASTM D3212*
12 pressure rated	*20*	*PVC SDR 26*	*ASTM 2241, Class 160*	*ASTM D3139* *ASTM C1173*

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 not include any separations less than nine-feet.

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, ductile iron, or PVC with a minimum pressure rating of 150 psi. The proposed project will not include any water supply lines.

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
8 & 12	***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.

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: ***8" (NR)***	Min. Slope: ***0.68%***	Max. Slope: ***2.46%***
Pipe Diameter: ***8" (PR)***	Min. Slope: ***0.68%***	Max. Slope: ***0.68%***
Pipe Diameter: ***12" (NR)***	Min. Slope: ***0.58%***	Max. Slope: ***2.00%***
Pipe Diameter: ***12" (PR)***	Min. Slope: ***0.70%***	Max. Slope: ***0.70%***

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.

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: ***8" (NR)*** Min. Trench Width: ***22***" Max. Trench Width: ***34"***

Pipe Diameter: ***8" (PR)*** Min. Trench Width: ***23***" Max. Trench Width: ***35"***

Pipe Diameter: ***12" (NR)*** Min. Trench Width: ***26.5***" Max. Trench Width: ***38.5"***

Pipe Diameter: ***12" (PR)*** Min. Trench Width: ***27***" Max. Trench Width: ***39"***

These trench widths account for the bell diameter.

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.

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: ***8"*** Max. Spacing: ***495.00 LF***

Pipe Diameter: ***12"*** Max. Spacing: ***279.49 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)

Vented manholes are proposed for this SCS. Refer to the plans and details for additional information.

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.

Live Load Calculations

Minimum burial depth without concrete encasement is six (6) feet. Based on Table 6-6 Live Loads on PVC pipe (from Uni-Bell Handbook for PVC) for this sewer line would be 1.39 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 hw=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 fifteen (15) feet as it exceeds the maximum burial depth for this line. 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 B.

Allowable Buckling Pressure:

$$q_a = 0.4 * \sqrt{32 * R_w * B' * E_b * (E * I / D^3)} \qquad \textit{Equation 1}$$

$$q_a = 0.4\sqrt{32 * 1 * 0.40 * 400 * (400{,}000 * 0.003 / 8.08^3)} = 43.17\ psi(8"PVC\ SDR26, NR)$$

$$q_a = 0.4 * \sqrt{32 * 1 * 0.40 * 400 * (400{,}000 * 0.003/8.29^3)} = 41.54\ psi(8"PVC\ SDR26, PR)$$

$$q_a = 0.4 * \sqrt{32 * 1 * 0.40 * 400 * (400{,}000 * 0.009/12.02^3)} = 41.21\ psi(12"PVC\ SDR26, NR)$$

$$q_a = 0.4 * \sqrt{32 * 1 * 0.40 * 400 * (400{,}000 * 0.010/12.26^3)} = 42.17\ psi(12"PVC\ SDR26, PR)$$

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

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

$$B' = \frac{1}{1 + 4 * e^{-0.065H}} \qquad \textit{Equation 3}$$

$$B' = \frac{1}{1 + 4 * e^{-.065*15}} = 0.40$$

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

$$I = 0.323^3/12 = 0.003\text{in}^3 \ (8'' \text{ PVC SDR 26, NR})$$
$$I = 0.332^3/12 = 0.003\text{in}^3 \ (8'' \text{ PVC SDR 26, PR})$$
$$I = 0.481^3/12 = 0.009\text{in}^3 \ (12\text{" PVC SDR 26, NR})$$
$$I = 0.490^3/12 = 0.010\text{in}^3 \ (12\text{" PVC SDR 26, PR})$$

$D = D_o - t$ *Equation 5*

$$D = 8.40 \text{ inches} - 0.323 \text{ inches} = 8.08 \text{ inches} \ (8''\text{PVC SDR 26, NR})$$
$$D = 8.625 \text{ inches} - 0.332 \text{ inches} = 8.29 \text{ inches} \ (8'' \text{ PVC SDR 26, PR})$$
$$D = 12.50 \text{ inches} - 0.481 \text{ inches} = 12.02 \text{ inches} \ (12'' \text{ PVC SDR 26, NR})$$
$$D = 12.75 \text{ inches} - 0.490 \text{ inches} = 12.26 \text{ inches} \ (12'' \text{ PVC SDR 26, PR})$$

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 hw = 0, Rw = 1. If $0 \leq hw \leq h$ (groundwater elevation is between the top of the pipe and the ground surface), calculate Rw 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/lineal inch = inch3. For solid wall pipe, "I" can be calculated with Equation 4
- t = Pipe structural wall thickness (in)
- D = Mean pipe diameter (in)
- D_o = Pipe outer diameter (in)

Pressure Under Installed Conditions

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

$$q_p = 0.361 * 0 + 1 * (125.17/8.08) + 1.39 = 16.88 \text{ psi } (8'' \text{ PVC SDR 26, NR})$$

$$q_p = 0.361 * 0 + 1 * (128.43/8.29) + 1.39 = 16.88 \text{ psi } (8'' \text{ PVC SDR 26, PR})$$

$$q_p = 0.361 * 0 + 1 * (186.21/12.02) + 1.39 = 16.88 \text{ psi } (12" \text{ PVC SDR 26, NR})$$

$$q_p = 0.361 * 0 + 1 * (189.92/12.26) + 1.39 = 16.88 \text{ psi } (12" \text{ PVC SDR 26, PR})$$

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)

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

$$W_c = 143 * 15 * (8.08 + 0.323)/144 = 125.17 \text{ lb/in}^2 (8'' \text{ PVC SDR 26, 1NR})$$

$$W_c = 143 * 15 * (8.29 + 0.332)/144 = 128.43 \text{ lb/in}^2 (8'' \text{ PVC SDR 26, PR})$$

$$W_c = 143 * 15 * (12.02 + 0.481)/144 = 186.21 \text{ lb/in}^2 (12'' \text{ PVC SDR 26})$$

$$W_c = 143 * 15 * (12.26 + 0.49)/144 = 189.92 \text{ lb/in}^2 (12'' \text{ PVC SDR 26})$$

Where:

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

D = Mean pipe diameter (in)

Pipe Diameter: ***8" (NR)*** Pipe Material: ***PVC, SDR 26*** q_a: ***43.17*** q_p: ***16.88***

Pipe Diameter: ***8" (PR)*** Pipe Material: ***PVC, SDR 26*** q_a: ***41.54*** q_p: ***16.88***

Pipe Diameter: ***12" (NR)*** Pipe Material: ***PVC, SDR 26*** q_a: ***41.21*** q_p: ***16.88***

Pipe Diameter: ***12" (PR)*** Pipe Material: ***PVC, SDR 26*** q_a: ***42.17*** q_p: ***16.88***

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

Wall Crushing Calculations

No portion of the proposed sewer line is located in the 5-year floodplain.

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

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

H=(24*4,000*3.876)/(143*8.4) = 309.77 (8"PVC,SDR26, NR)

$A = 0.323(in) \times 12(in/ft) = 3.876$

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.

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 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 psi/3,000 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.

$$zeta = \frac{1.44}{f + (1.44 - f) * (E_b / E_{n'})}$$ *Equation 10*

$$\text{zeta} = \frac{1.44}{1.22 + (1.44 - 1.22) * 0.13} = 1.15(8'' \text{ PVC SDR 26, NR})$$

$$\text{zeta} = \frac{1.44}{1.22 + (1.44 - 1.22) * 0.13} = 1.15(8'' \text{ PVC SDR 26, PR})$$

$$\text{zeta} = \frac{1.44}{1.00 + (1.44 - 1.00) * 0.13} = 1.36(12'' \text{ PVC SDR 26})$$

$$\text{zeta} = \frac{1.44}{1.00 + (1.44 - 1.00) * 0.13} = 1.36(12'' \text{ PVC SDR 26})$$

$$f = \frac{b/d_a - 1}{1.154 + 0.444 * (b/d_a - 1)}$$ *Equation 11*

$$\text{f} = \frac{(34/8.40) - 1}{1.154 + 0.444 * ((34/8.40) - 1)} = 1.22(8'' \text{ PVC SDR 26, NR})$$

$$\text{f} = \frac{(35/8.625) - 1}{1.154 + 0.444 * ((35/8.625) - 1)} = 1.22(8'' \text{ PVC SDR 26, PR})$$

$$\text{f} = \frac{(38.5/12.50) - 1}{1.154 + 0.444 * ((38.5/12.50) - 1)} = 1.0\ (12'' \text{ PVC SDR 26, NR})$$

$$\text{f} = \frac{(39/12.750) - 1}{1.154 + 0.444 * ((39/12.750) - 1)} = 1.0\ (12'' \text{ PVC SDR 26, PR})$$

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: ***8" (NR)*** Trench Width: ***34"*** Zeta: ***1.15***

Pipe Diameter: ***8" (PR)*** Trench Width: ***35"*** Zeta: ***1.15***

Pipe Diameter: ***12" (NR)*** Trench Width: ***38.5"*** Zeta: ***1.36***

Pipe Diameter: ***12" (PR)*** Trench Width: ***39"*** Zeta: ***1.36***

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: ***8" & 12"*** 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.

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

Equation 12

$$\Delta Y/D(\%) = \frac{0.096 * (14.90 + 1.39) * 100}{(0.149 * 115) + (0.061 * 1.15 * 400)} = 3.46\%(8'' \text{ PVC SDR 26, NR})$$

$$\Delta Y/D(\%) = \frac{0.096 * (14.90 + 1.39) * 100}{(0.149 * 115) + (0.061 * 1.15 * 400)} = 3.46\%(8'' \text{ PVC SDR 26, PR})$$

$$\Delta Y/D(\%) = \frac{0.096 * (14.90 + 1.39) * 100}{(0.149 * 115) + (0.061 * 1.36 * 400)} = 3.11\%(12'' \text{ PVC SDR 26, NR})$$

$$\Delta Y/D(\%) = \frac{0.096 * (14.90 + 1.39) * 100}{(0.149 * 115) + (0.061 * 1.36 * 400)} = 3.11\%(12'' \text{ PVC SDR 26, PR})$$

$$L_p = \frac{\gamma_s * H}{144}$$

Equation 13

$$L_p = \frac{143 * 15}{144} = 14.90 \text{ psi}$$

%ΔY/D = Predicted % vertical deflection under load

ΔY = Change in vertical pipe diameter under load

D = Undeflected 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)

Type of Pipe Material	P_s (psi)	Zeta Factor Assumed or Calculated	E_b (psi)	% Deflection
8" PVC SDR 26	115	1.15	400	3.46
12" PVC SDR 26	115	1.36	400	3.11

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

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

6/26/2024

APPENDIX A (TABLES)

TABLE 7.3
AVERAGE VALUES OF MODULUS OF SOIL REACTION, E'
(For Initial Flexible Pipe Deflection)
From Uni-Bell Handbook of PVC Pipe: Design and Construction, Fourth Edition (2001)

Soil type-pipe bedding material (Unified Classification System[a]) (1)	E' for Degree of Compaction of Bedding, in pounds per square inch			
	Dumped (2)	Slight, < 85% Proctor, <40% relative density (3)	Moderate, 85%-95% Proctor, 40%-70% relative density (4)	High, >95% Proctor, >70% relative density (5)
Fine-grained Soils (LL>50)[b] Soils with medium to high plasticity, CH, MH, CH-MH	No data available; consult a competent soils engineer; Otherwise use E' = 0			
Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL, with less than 25% coarse-grained particles	50	200	400	1,000
Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL, with more than 25% coarse-grained particles	100	400	1,000	2,000
Coarse-grained Soils with Fines GM, GC, SM, SC[c] contains more than 12% fines				
Coarse-grained Soils with Little or no Fines GW, GP, SW, SP[c] contains less than 12% fines	200	1,000	2,000	3,000
Crushed Rock	1,000	3,000	3,000	3,000
Accuracy in Terms of Percentage Deflection[d]	± 2	± 2	± 1	± 0.5

[a]ASTM Designation D 2487, USBR Designation E-3.
[b]LL = Liquid limit.
[c]Or any borderline soil beginning with one of these symbols (i.e. GM-GC, GC-SC).
[d]For ± 1% accuracy and predicted deflection of 3%, actual deflection would be between 2% and 4%
Note: Values applicable only for fills less than 50 ft (15 m). Table does not include any safety factor. For use in predicting initial deflections only, appropriate Deflection Lag Factor must be applied for long-term deflections. If bedding falls on the borderline between two compaction categories, select lower E' value or average the two values. Percentage Proctor based on laboratory maximum dry density from test standards using about 12,500 ft-lb/cu ft (598,000 J/m^3) (ASTM D 698, AASHTO T-99, USBR Designation E-11). 1 psi = 6.9 kPa.

SOURCE: "Soil Reaction for Buried Flexible Pipe" by Amster K. Howard, U.S. Bureau of Reclamation, Denver, Colorado. Reprinted with permission from American Society of Civil Engineers.

TABLE 6.6
LIVE LOADS ON PVC PIPE
From Uni-Bell Handbook of PVC Pipe: Design and Construction, Fourth Edition (2001)

Height of Cover (ft)	Live Load Transferred to Pipe, lb/in^2			Height of Cover (ft)	Live Load Transferred to Pipe, lb/in^2		
	Highway H20[1]	Railway E80[2]	Airport [3]		Highway H20[1]	Railway E80[2]	Airport [3]
1	12.50			14	*	4.17	3.06
2	5.56	26.39	13.14	16	*	3.47	2.29
3	4.17	23.61	12.28	18	*	2.78	1.91
4	2.78	18.40	11.27	20	*	2.08	1.53
5	1.74	16.67	10.09	22	*	1.91	1.14
6	1.39	15.63	8.79	24	*	1.74	1.05
7	1.22	12.15	7.85	26	*	1.39	*
8	0.69	11.11	6.93	28	*	1.04	*
10	*	7.64	6.09	30	*	0.69	*
12	*	5.56	4.76	35	*	*	*
				40	*	*	*

[1] *Simulates 20 ton truck traffic + impact (Source: ASTM A 796)*
[2] *Simulates 80,000 lb/ft railway load + impact (Source: ASTM A 796)*
[3] *180,000 lbs. dual tandem gear assembly. 26 inch spacing between tires and 66 inch center-to-center spacing between fore and aft tires under a rigid pavement 12 inches thick + impact.*
* *Negligible live load influence.*

SOIL CLASSIFICATION CHART

From ASTM D2321-11: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

TABLE 1 Soil Classification Chart (see Classification D2487)

	Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
					Group Symbol	Group Name[B]
Coarse-Grained Soils	Gravels	Clean gravels	C ≥ 4 and 1 ≤ Cc ≤ 3[C]		GW	Well-graded gravel[D]
More than 50% retained on No. 200 sieve	More than 50% of coarse fraction retained on No. 4 sieve	Less than 5% of fines[E]	Cu < 4 and/or 1> Cc>3[C]		GP	Poorly graded gravel[D]
		Gravels with more than 12% fines[E]	Fines classify as ML or MH		GM	Silty gravel[DFG]
			Fines classify as CL or CH		GC	Clayey gravel[DFG]
	Sands	Clean sands	Cu ≥ 6 and 1 ≤ Cc ≤ 3[C]		SW	Well-graded sand[H]
	50% or more of coarse fraction passes on No. 4 sieve	Less than 5% fines[I]	Cu < 6 and/or 1 > Cc > 3[C]		SP	Poorly graded sand[H]
		Sand with fines	Fines classify as ML or MH		SM	Silty sand[FGH]
		More than 12% fines[I]	Fines classify as CL or CH		SC	Clayey sand[FGH]
Fine-Grained Soils	Silts and clays	Inorganic	PI > 7 and plots on or above "A" line[J]		CL	Lean clay[KLM]
50% or more passes the No. 200 Sieve	Liquid limit less than 50		PI < 4 and plots below "A" line[J]		ML	silt[KLM]
		Organic	Liquid Limit-Oven dried	<0.75	OL	Organic clay[KLMN]
			Liquid Limit-Not dried			Organic silt[KLMO]
	Silts and clays	Inorganic	PI plots on or above "A" line		CH	Fat clay[KLM]
	Liquid limit 50 or more		Plots below "A" line		MH	Elastic silt[KLM]
		Organic	Liquid Limit-Oven Dried	<0.75	OH	Organic clay[KLMP]
			Liquid Limit-Not Dried			Organic silt[KLMQ]
Highly organic soils	Primarily organic matter, dark in color, and organic odor				PT	peat

[A] Based on the material passing the 3-in. (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] $Cu = D_{60} / D_{10}$

$$Cc = \frac{(D_{30})^2}{D_{10} x D_{60}}$$

[D] If soil contains ≥15 % sand, add "with sand" to group name.
[E] Gravels with 5 to 12 % fines require dual symbols:
GW-GM well-graded gravel with silt:
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
[F] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[G] If fines are organic, add "with organic fines" to group name.
[H] If soil contains ≥ 15 % gravel, add "with gravel" to group name.
[I] Sands with 5 to 12 % fines require dual symbols:
SW-SM well graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay
[J] If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay (see Test Method D4318).
[K] If soil contains 15 to 29 % plus No. 200, add "with sand" or "with gravel", whichever is predominant.
[L] If soil contains ≥ 30 % plus No. 200, predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30 % plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.

SOIL CLASSIFICATION CHART

From ASTM D2321-11: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

TABLE 2 Soil Classes

Soil Group [A,B]	Soil Class	American Association of State Highway and Transportation Officials (AASHTO) Soil Groups [C]
Crushed rock, angular [D], 100% passing 1-1/2 in. sieve, </=15 % passing #4 sieve, </= 25 % passing 3/8 in. sieve and </= 12 % passing #200 sieve	Class I	--
Clean, coarse grained soils: SW, SP, GW, GP or any soil beginning with one of these symbols with </= 12 % passing #200 sieve[E,F]	Class II	A1, A3
Coarse grained soils with fines: GM, GC, SM, SC or any soil beginning with one of these symbols, containing > 12 % passing #200 sieve; Sandy or gravelly fine-grained soils: CL, ML, or any soil beginning with one of these symbols, with >/= 30 % retained on #200 sieve	Class III	A-2-4, A-2-5, A-2-6, or A-4 or A-6 soils with more than 30% retained on #200 sieve
Fine-grained soils: CL, ML, or any soil beginning with one of these symbols, with <30 % retained on #200 sieve	Class IV	A-2-7, or A-4, or A-6 soils with 30% or less retained on #200 sieve
MH, CH, OL, OH, PT	Class V Not for use as embedment	A5, A7

[A] See Classification D2487, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
[B] Limits may be imposed on the soil group to meet project or local requirements if the specified soil remains within the group. For example, some project applications require a Class I material with minimal fines to address specific structural or hydraulic conditions and the specification may read "Use Class I soil with a maximum of 5% passing the #200 sieve."
[C] AASHTO M145, Classification of Soils and Soil Aggregate Mixtures.
[D] All particle face shall be fractured.
[E] Materials such as broken coral, shells, and recycled concrete, with $\leq$ = 12% passing a No. 200 sieve, are considered to be Class II materials. These materials should only be used when evaluated and approved by the Engineer.
[F] Uniform fine sands (SP) with more than 50% passing a No. 100 sieve (0.006 in., 0.15 mm) are very sensitive to moisture and should not be used as backfill unless specifically allowed in the contract documents. If use of these materials is allowed, compaction and handling procedures should follow the guidelines for Class III materials.

SOIL CLASSIFICATION CHART

From ASTM D2321-11: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

TABLE 3 Recommendations for Installation and Use of Soils and Aggregates for Foundation and Pipe-Zone Embedment

Soil Class[A]	Class I[B]	Class II	Class III	Class IV
General Recommendations and Restrictions	Acceptable and common where no migration is probable or when combined with a geotextile filter media. Suitable for use as a drainage blanket and under drain where adjacent material is suitably graded or when used with a geotextile filter fabric (see X1.8).	Where hydraulic gradient exists check gradation to minimize migration. Clean groups are suitable for use as a drainage blanket and underdrain (see Table 2). Uniform fine sands (SP) with more than 50 % passing a #100 sieve (0.006 in., 0.15 mm) behave like silts and should be treated as Class IV soils.	Do not use where water conditions in trench prevent proper placement and compaction. Not recommended for use with pipes with stiffness of 9 psi or less.	Difficult to achieve high-soil stiffness. Do not use where water conditions in trench prevent proper placement and compaction. Not recommended for use with pipes with stiffness of 9 psi or less.
Foundation	Suitable as foundation and for replacing over-excavated and unstable trench bottom as restricted above.	Suitable as foundation and for replacing over-excavated and unstable trench bottom as restricted above. Install and compact in 12 in. (300 mm) maximum layers.	Suitable for replacing over-excavated trench bottom as restricted above. Install and compact in 6 in. (150 mm) maximum layers.	Suitable for replacing over-excavated trench bottom as restricted above. Install and compact in 6-in (150 mm) maximum layers.
Pipe Embedment	Suitable as restricted above. Work material under pipe to provide uniform haunch support.	Suitable as restricted above. Work material under pipe to provide uniform haunch support.	Suitable as restricted above. Difficult to place and compact in the haunch zone.	Suitable as restricted above. Difficult to place and compact in the haunch zone.
Embedment Compaction: Min Recommended Percent Compaction, SPD[D]	See Note[C]	85 % (SW and SP soils) For GW and GP soils See Note[E]	90 %	95 %
Relative Compactive Effort Required to Achieve Minimum Percent Compaction	Low	Moderate	High	Very high
Compaction Methods	Vibration or impact	Vibration or impact	Impact	Impact
Required Moisture Control	None	None	Maintain near optimum to minimize compactive effort	Maintain near optimum to minimize compactive effort

[A] Class V materials are unsuitable as embedment. They may be used as final backfill as permitted by the engineer.
[B] Class I materials have higher stiffness than Class II materials, but data on specific soil stiffness of placed, uncompacted Class I materials can be taken equivalent to Class II materials compacted to 95% of maximum standard Proctor density (SPD95), and the soil stiffness of compacted Class I materials can be taken equivalent to Class II materials compacted to 100% of maximum standard Proctor density (SPD100). Even if placed uncompacted (that is, dumped), Class I materials should always be worked into the haunch zone to assure completed placement.
[C] Suitable compaction typically achieved by dumped placement (that is, uncompacted but worked into haunch zone to ensure complete placement).
[D] SPD is standard Proctor density as determined by Test Method D698.
[E] Place and compact GW and GP soils with at least two passes of compaction equipment.

FIGURE 7.4
BEDDING ANGLE
From Uni-Bell Handbook of PVC Pipe: Design and Construction, Fourth Edition (2001)

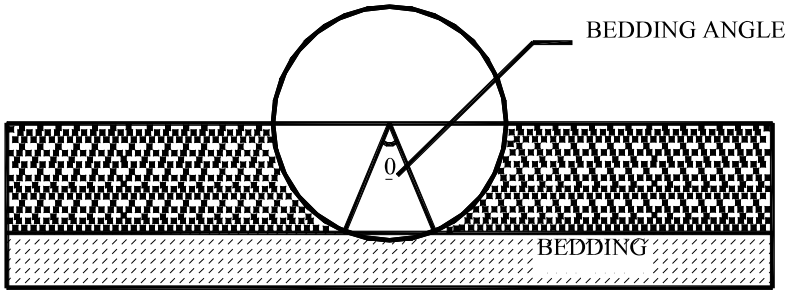


TABLE 7.1
PVC PIPE STIFFNESS (psi)

DR or SDR	Min. E = 400,000 psi	Min. E = 500,000 psi
64	7	9
51	14	18
42	26	32
41	28	35
35	46	57
33.5	52	65
32.5	57	71
28	91	114
26	115	144
25	129	161
21	224	279
18	364	455
17	437	546
14	815	1,019
13.5	916	1,145

TABLE 7.2
VALUES OF BEDDING CONSTANT, K

BEDDING ANGLE (DEGREES)	K
0	0.110
30	0.108
45	0.105
60	0.102
90	0.096
120	0.090
180	0.083

APPENDIX B (SOIL UNIT WEIGHT VALUES)

Raba Kistner

January 14, 2009

Raba-Kistner Consultants, Inc.
12821 W. Golden Lane
P.O. Box 690287, San Antonio, TX 78269-0287
(210) 699-9090 • FAX (210) 699-6426
www.rkci.com

Charles P. "Frosty" Forster, P.E., P.G.
Pape Dawson Engineers
555 East Ramsey
San Antonio, Texas 78216

RE: Soil Unit Weight Values for Backfill Materials
Various Projects
San Antonio, Texas

Dear Mr. Forster:

Raba-Kistner Consultants Inc. (R-K) is pleased to submit this letter providing general guidance for selecting design soil unit weights for use in utility trench design.

In general, the following table contains a list of the frequently used trench backfill materials in the San Antonio area. The table also contains approximate values for the soil dry unit weight, moist unit weight and saturated unit weight for these materials assuming 90 to 95 percent compaction utilizing a standard Proctor (ASTM D 698.)

MATERIAL DESCRIPTION	DRY UNIT WEIGHT, PCF	MOIST UNIT WEIGHT, PCF	SATURATED UNIT WEIGHT, PCF
TxDOT TEX-113E Type A, Gr. 1 or 2	130	137	143
TxDOT TEX-113E Type A, Gr. 3 thru 5	128	135	143
Limestone Millings	115	124	134
Gravelly Clay	110	120	132
Clay	100	120	127
Clayey Sand	95	106	123
Gravel (Clean)	115	120	134
Sand (Clean)	92	98	120
Pit Run Gravel	127	137	142

We appreciate the opportunity to be of service to you. If you have any questions or need additional assistance, please call.

Very truly yours,

RABA-KISTNER CONSULTANTS, INC.

STATE OF TEXAS
CHRIS L. SCHULTZ
80680
LICENSED
PROFESSIONAL ENGINEER
1/14/09

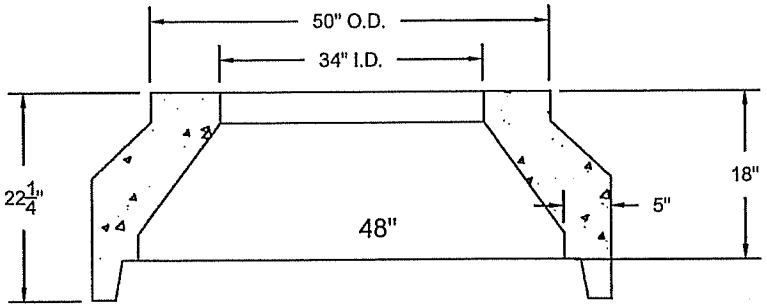
Chris L. Schultz, P.E.
Senior Vice President

CLS/mem

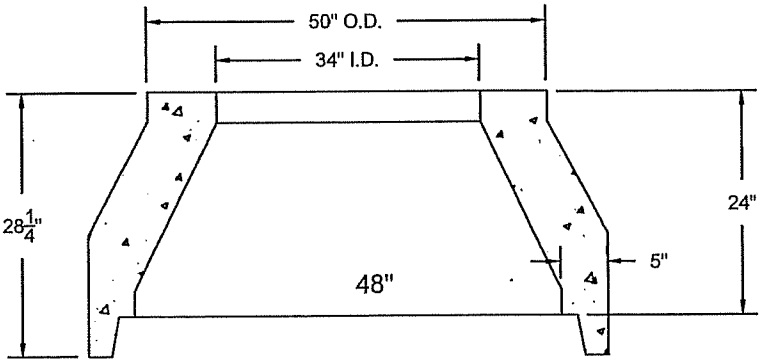
APPENDIX C (STANDARD SPECS AND PRE-CAST MANHOLES SPECS)

48" Dia. Concentric Cones

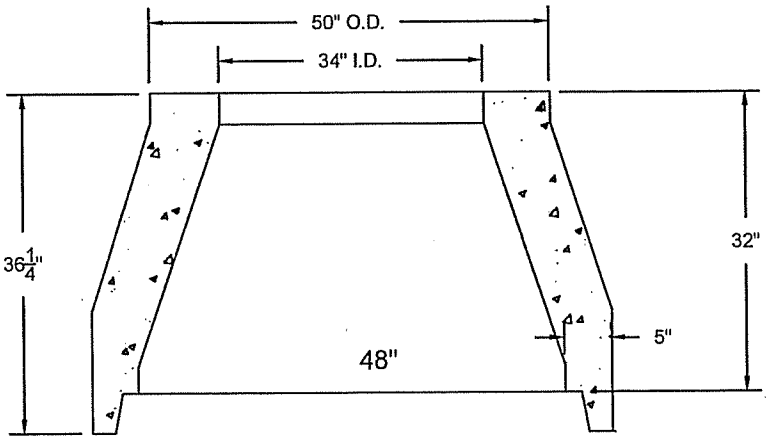
18" Yeild



24" Yeild



32" Yeild



NOTES:
1. Concrete: 4,000 PSI, 28 day Strength. Exceeds ASTM C - 478 - 11
2. Welded wire fabric strength fy = 65,000 psi.
3. Live Load - AASHOT HS-20.

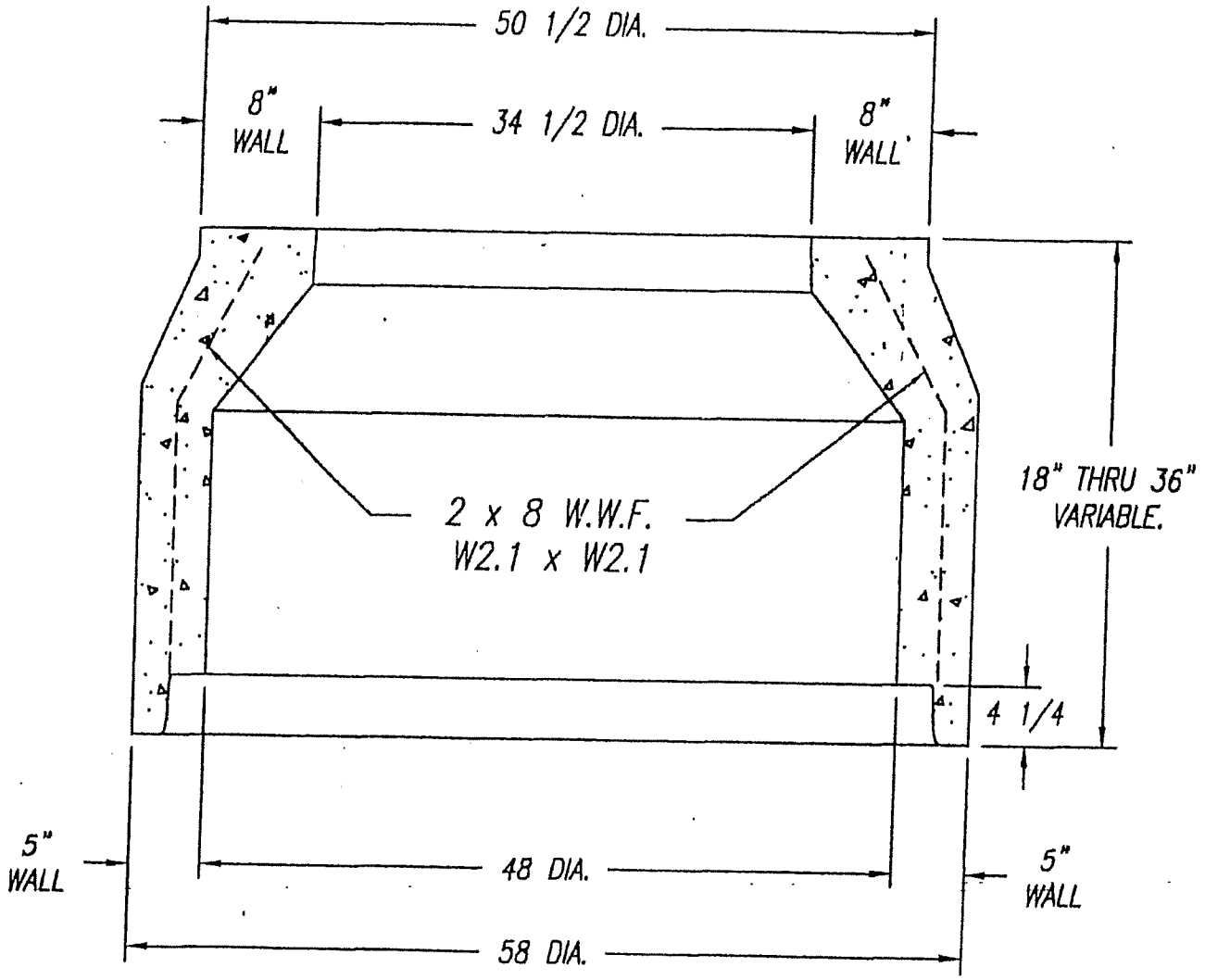
Charlotte's Concrete, Inc.

Charlotte's Concrete, Inc.
4950 Lane Dr.
San Antonio, Tx. 78263
Ph. (210) 648-4774

NPCA CERTIFIED PLANT

FOR 18", 24" & 32" Concentric Cones			
JOB			
DRAWN BY CA	DATE 08-06-15	REV. NO. -	SHEET 1 OF 1
FILE			

\APPROVAL\CONCENTRIC.DWG



(7R JOINT)

REF. FORM DWG. 3-303-5561

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MACHINE & FOUNDRY CORP.

A MEMBER OF THE BESSER FAMILY OF COMPANIES

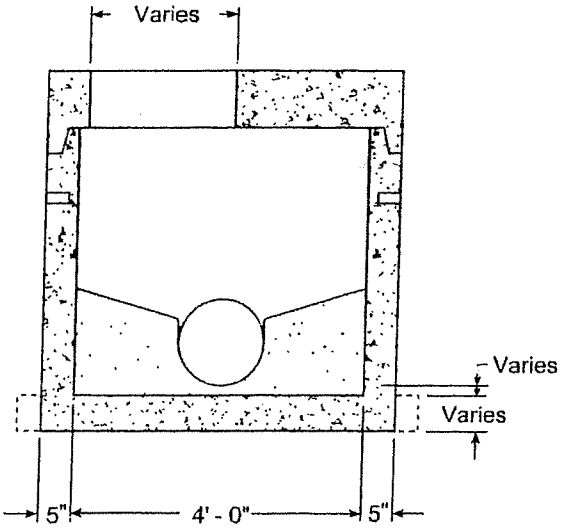
BOONE, IOWA U.S.A.

CHARLOTTES

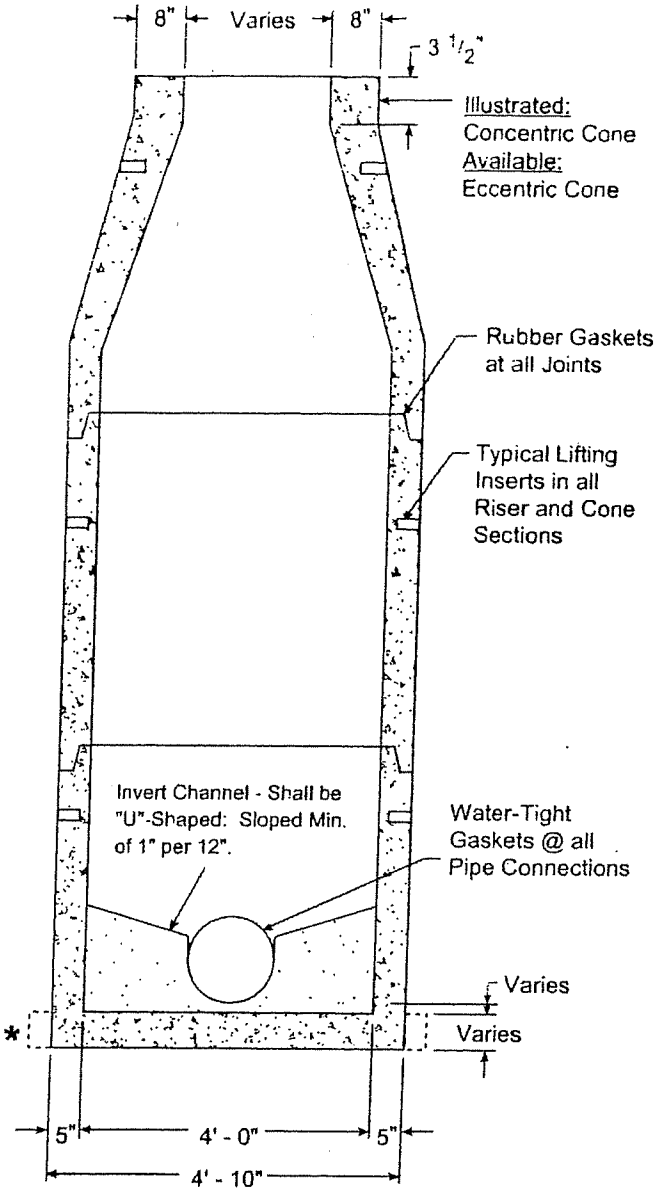
48 x 5 x 34 1/2 x 8 x 36 & 18

CONCENTRIC CONCRETE SECTION

DRAFTER	JJK	4/19/02	CONCENTRIC	REV.
CHECKED				
SCALE:	1/12" = 1"			



Flattop Illustration
for Shallow Manhole



Section View
4' I.D. Manhole - Regular Base
with Reducing Cone

Materials & Features

HOLES AS SPECIFIED: Max diameter = 32"
CONCRETE: 5,000 PSI, 28 day strength.
REINFORCING: Meets or exceeds ASTM C478 requirements.
Average weight of 24" depth base w/8" invert = 4,500 lbs.
Estimated weight of riser and cone sections = 870 lbs. / vt ft.

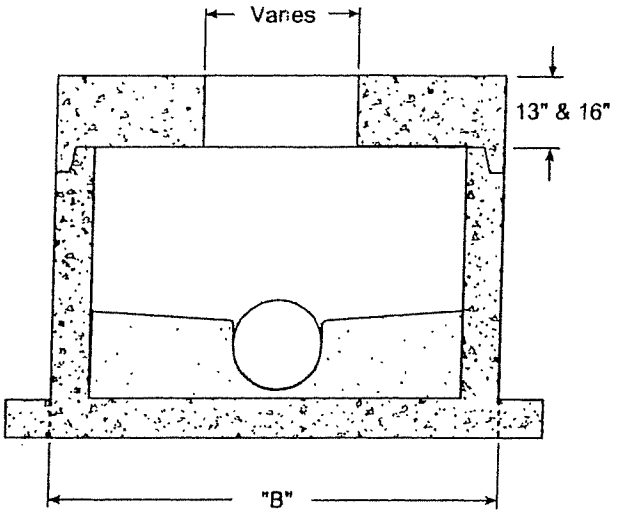
* - Extended base is available to meet local requirements.

In the event a boot is loose contact your Hanson representative to resolve.

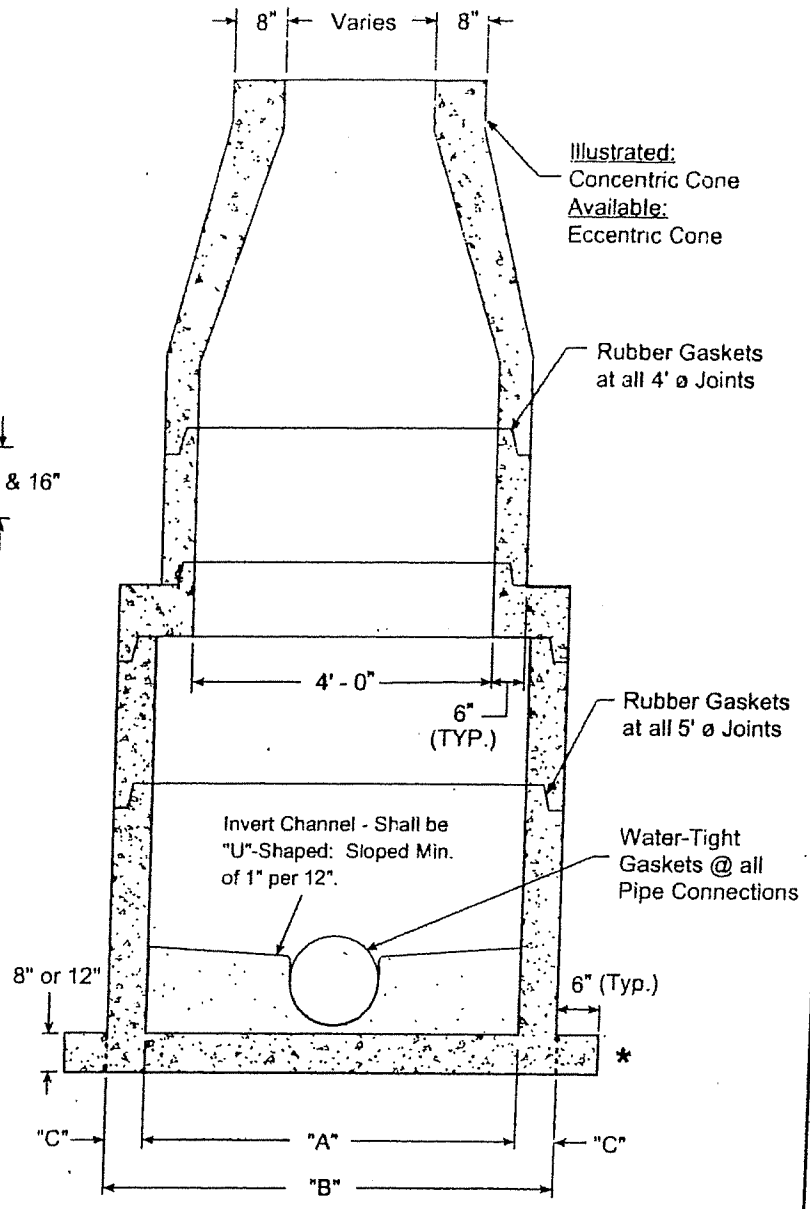
"Manufactured to your specifications."

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION/PAGE	DATE	
4' I.D. Manhole **Regular Base w/ Reducing Cone**	All Plants	TX	5.5	08-15-06	Hanson



Flattop Illustration
for Shallow Manhole



Section View
5'/4' & 6'/4' I.D. Manhole
Extended Base with Reducing Cone

Materials & Features

HOLES AS SPECIFIED: for 5' I.D. max diameter = 40"
for 6' I.D. max diameter = 54"
CONCRETE: 5,000 PSI, 28 day strength.
REINFORCING: Meets or exceeds ASTM C478 requirements.
Average weight of 24" depth base w/8" invert:
for 5' I.D. = 7,500 lbs.
for 6' I.D. = 10,600 lbs.
Estimated weight of riser and sections:
for 5' I.D. = 1,325 lbs. / vt. ft.
for 6' I.D. = 1,800 lbs. / vt. ft.
For pipe sizes 15" and larger, invert shall be equal to the larger pipe diameter.
* - Extended base shown: Regular base also available."
In the event a boot is loose contact your Hanson representative to resolve.

"Manufactured to your specifications."

Pipe Size	I.D. "A"	O.D. "B"	Wall Thk. "C"
5'	5' - 0"	6' - 0"	6"
6'	6' - 0"	7' - 2"	7"

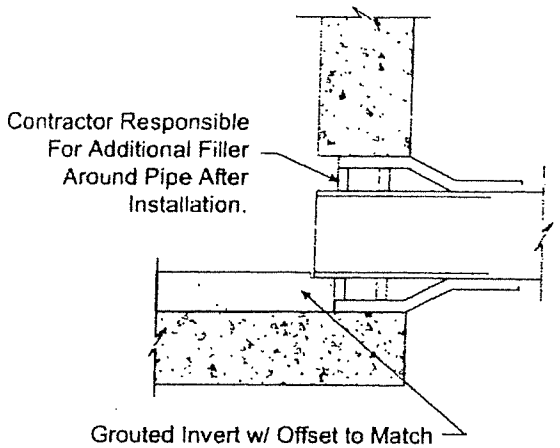
-No Scale-
All dimensions subject to allowable specification tolerances.

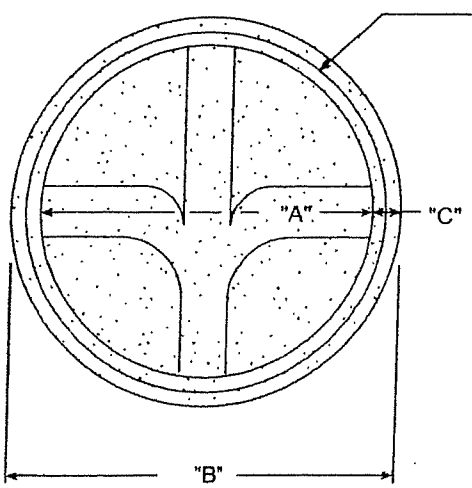
TITLE	PLANT	STATE	SECTION/PAGE	DATE
5'/4' & 6'/4'I.D. Manhole **Extended Base w/Reducing Cone**	All Plants	TX	5.6	08-15-06

Hanson

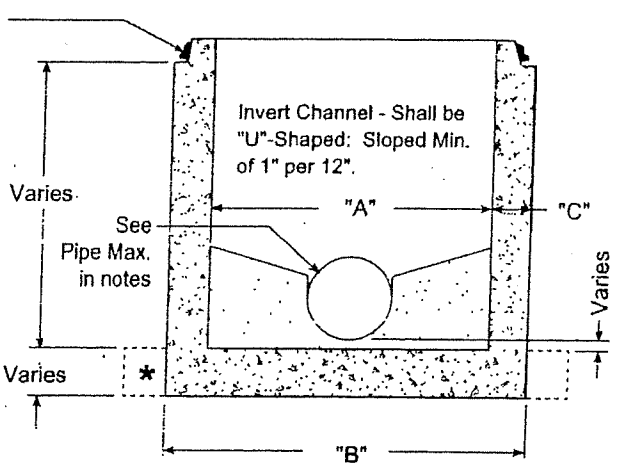
Precast Manholes

For Pipe Entering the Manhole at Excessive Depths Above the Flow Line Out, the Contractor May be Responsible for Grout Work Necessary to Bring Channel up to Flow Line on Inlet Pipe.





Plan View



Section View

Pipe Size	I.D. "A"	O.D. "B"	Wall Thk. "C"
4'	4' - 0"	4' - 10"	5"
5'	5' - 0"	6' - 0"	6"
6'	6' - 0"	7' - 2"	7"

Materials & Features

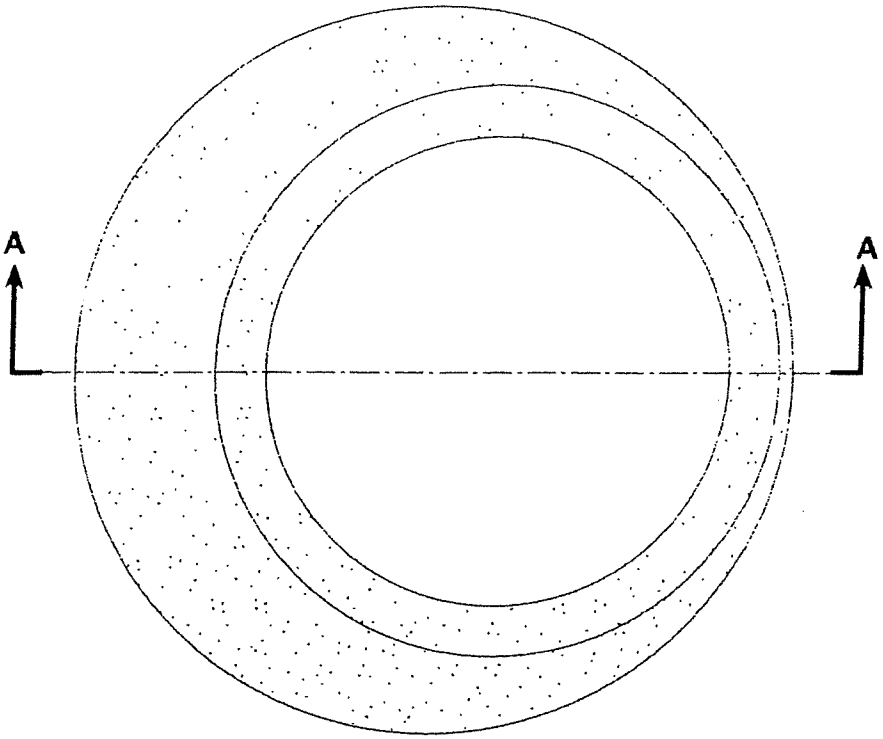
HOLES AS SPECIFIED:
- For 4' I.D. max. diameter = 32"
- For 5' I.D. max. diameter = 40"
- For 6' I.D. max. diameter = 54"

CONCRETE: 5,000 PSI, 28 day strength
REINFORCING: Meets or exceeds ASTM C478 requirements.
Average weight of 24" depth base w/8" invert = 4,500 lbs
Water-tight gaskets at all pipe connections.
* - Regular base shown: Extended base also available.
In the event a boot is loose contact your Hanson representative to resolve.

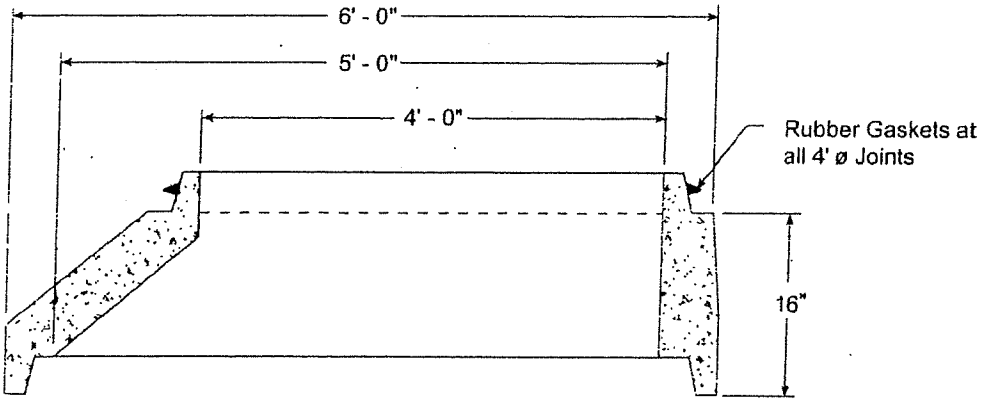
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION/PAGE	DATE
Details: 4', 5' & 6' I.D. Precast Regular Manhole Base	All Plants	TX	5.7	08-15-06

Hanson



Plan View



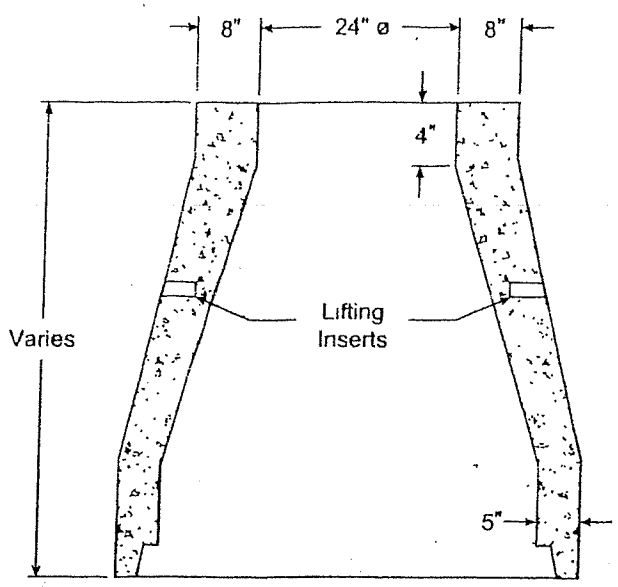
Section View

Materials & Features

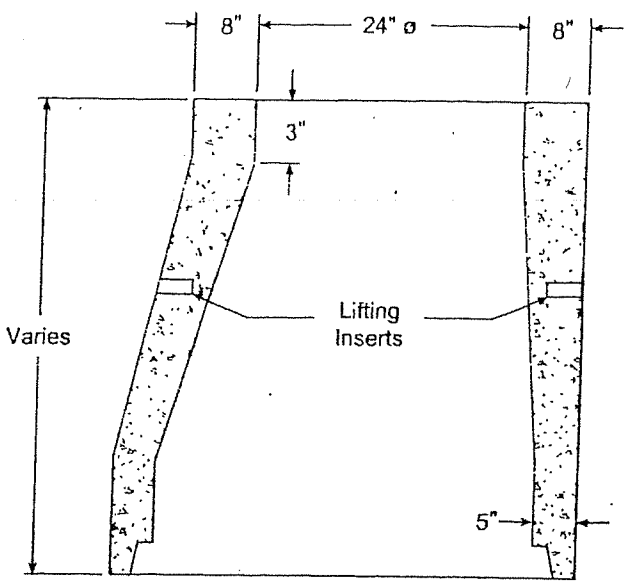
CONCRETE. 5,000 PSI. 28 day strength.
REINFORCING: Meets or exceeds ASTM C478 requirements.
CONSTRUCTION OF PRECAST is in accordance with ASTM C478.
Concrete is poured according to ACI-500.

-No Scale-
All dimensions subject to allowable specification tolerances.

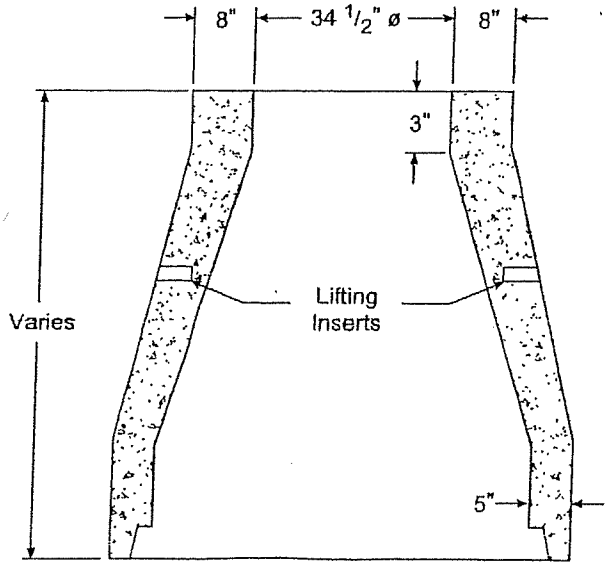
TITLE	PLANT	STATE	SECTION.PAGE	DATE	
5' x 4' Conical Adaptor	Waco	TX	5 8	08-15-06	Hanson



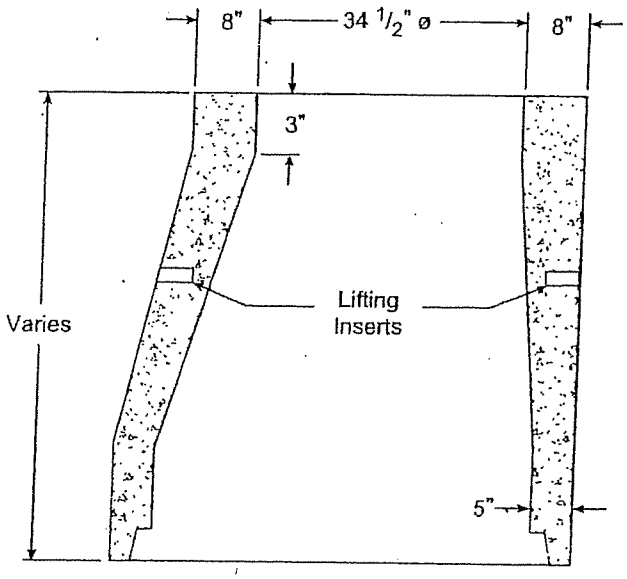
Concentric Cone
24" ø Opening



Eccentric Cone
24" ø Opening



Concentric Cone
34 1/2" ø Opening



Eccentric Cone
34 1/2" ø Opening

Materials & Features

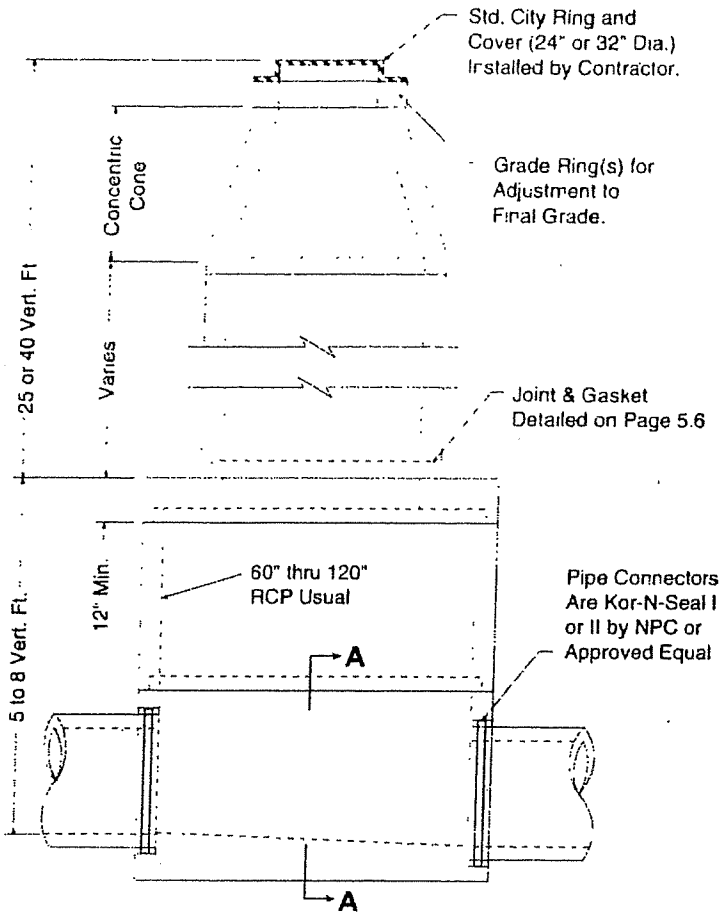
CONCRETE: 5,000 PSI, 28 day strength.
REINFORCING: Meets or exceeds ASTM C478 requirements.
30" ø also available in North Texas.

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION,PAGE	DATE
Hanson 48" Manhole Reducing Cone Detail	Waco Houston	TX	5.9	08-15-06

Hanson

Precast Manholes



w/ Precast Base

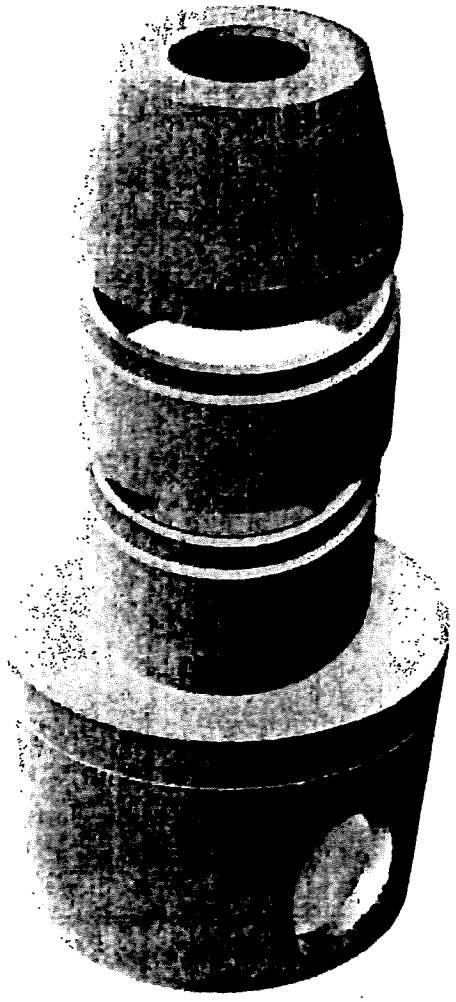
Section A-A

Base Slab Reinforcing

30' Deep Structure
60"ø - 6" Thick Slab min. - #5 @ 8" ea.way
72"ø - 8" Thick Slab min. - #5 @ 8" ea.way
84"ø - 8" Thick Slab min. - #5 @ 6" ea.way
96"ø - 10" Thick Slab min. - #5 @ 6" ea.way

45' Deep Structure
60"ø - 8" Thick Slab min. - #5 @ 8" ea.way
72"ø - 8" Thick Slab min. - #5 @ 8" ea.way
84"ø - 10" Thick Slab min. - #5 @ 6" ea.way
96"ø - 12" Thick Slab min. - #5 @ 6" ea.way

All Reinforcing has $1\frac{1}{2}$" cover from top of slab.



Isometric View

Materials & Features

CONCRETE: 5,000 PSI in 28 days.

REINFORCING STEEL, per ASTM A-615, Grade 60.

REINFORCING to meet AASHTO HS 20-44 Loading.

DESIGN EQUAL TO OR EXCEEDS ASTM C-478

In the event a boot is loose contact your Hanson representative to resolve.

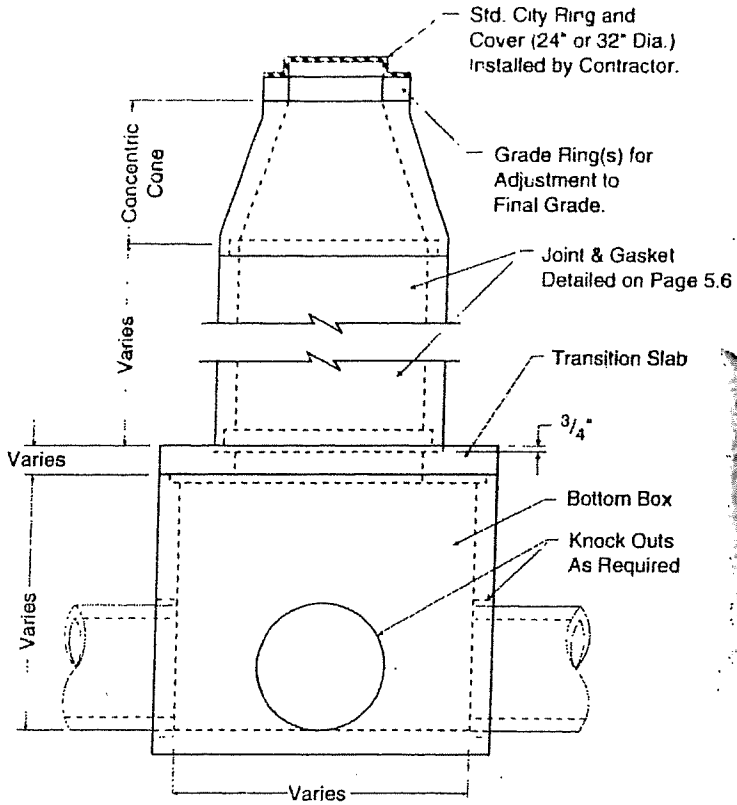
Note:

- Inverts shall be specifically sized for connecting pipes; and shall be U-Shaped with the min. depth 3/4 of the largest pipe diameter.

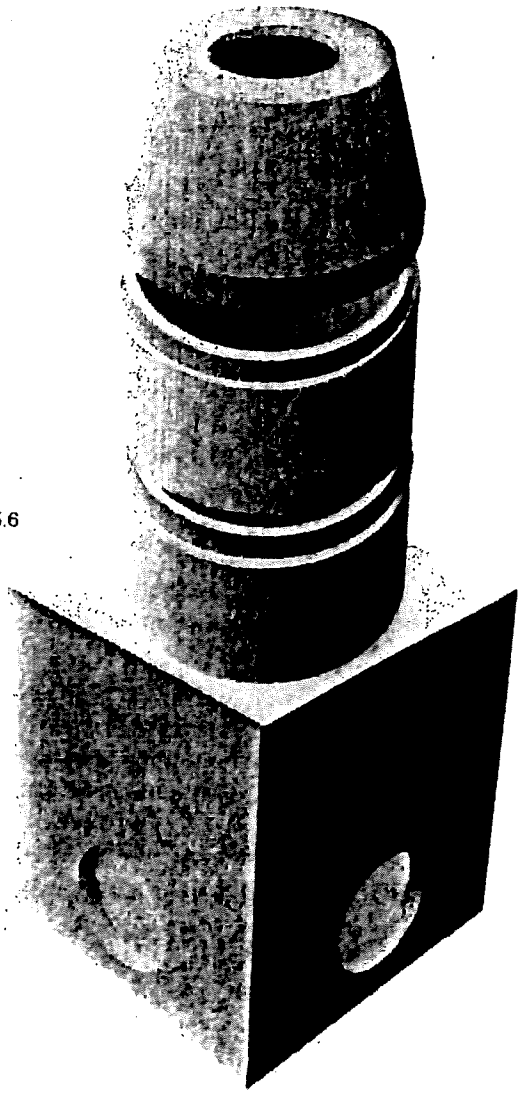
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE	
30 & 45 Ft. Depth 60" thru 96"Large Base Manhole	Houston San Antonio	TX	5.10	08-15-06	Hanson

Precast Manholes



Side View



Isometric View

Materials & Features

CONCRETE: 5,000 PSI in 28 days.

REINFORCING STEEL: per ASTM A-615 / A-185

REINFORCING to meet AASHTO HS 20-44 Loading.

BASE DESIGN EQUAL TO OR EXCEEDS ASTM C-357

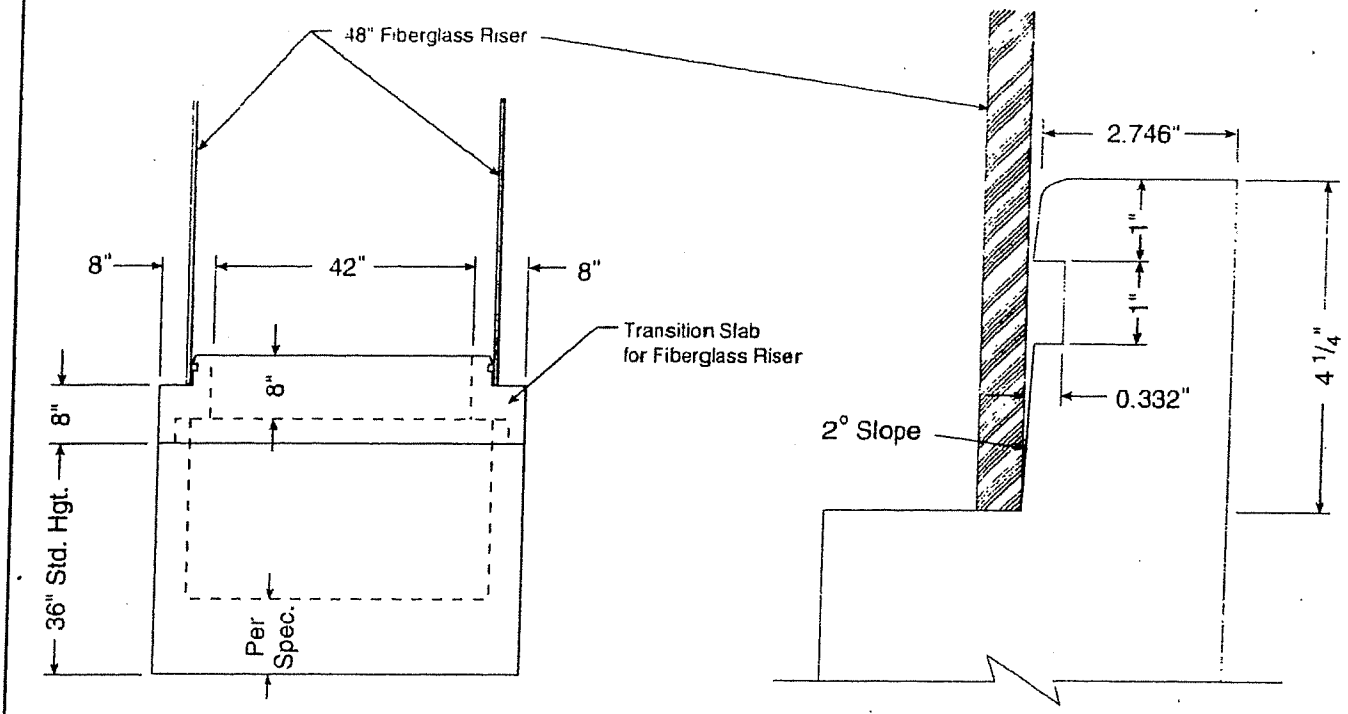
RISER DESIGN EQUAL TO OR EXCEEDS ASTM C-478

In the event a boot is loose contact your Hanson representative to resolve.

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE
Type "C" Manhole	Houston San Antonio	TX	5.11	08-15-06

Hanson



Profile **Joint Detail**

Materials & Features

CONCRETE: 5,000 PSI in 28 days.

REINFORCING STEEL: per ASTM A-615, Grade 60.

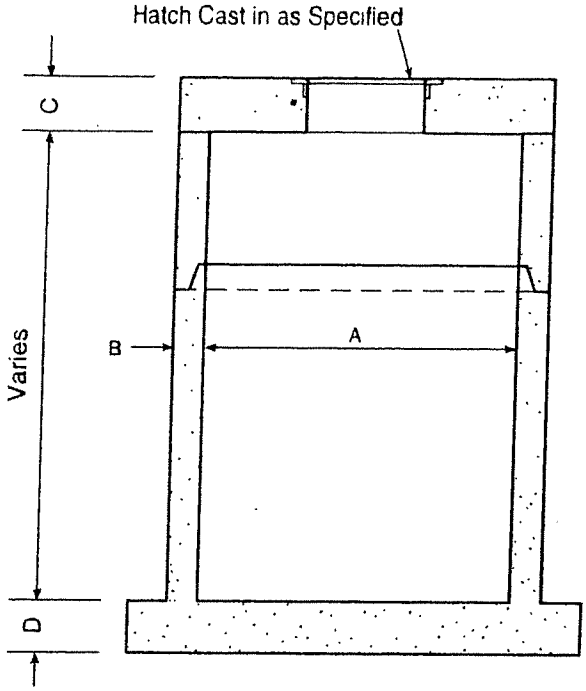
REINFORCING to meet AASHTO HS 20-44 Loading.

DESIGN EQUAL TO OR EXCEEDS ASTM C-478

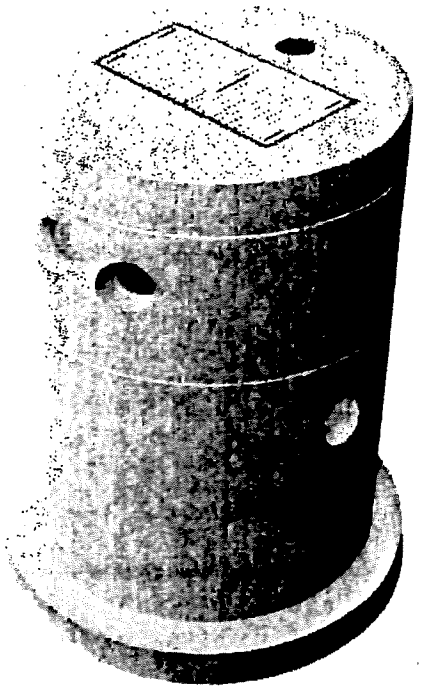
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE	
ASTM C-478 Special Base	Houston	TX	5.12	08-15-06	Hanson

Precast Manholes

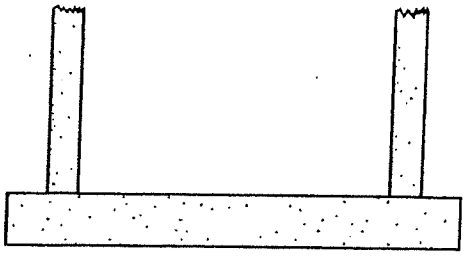


Section View
(Base configuration for 60", 72" & 84")

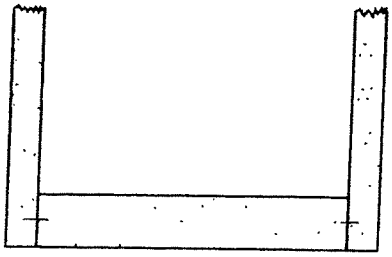


Isometric View

Product Dimensions			
A	B	C	D
60"	Contact your local Hanson representative for product dimensions.		
72"			
84"			
96"			
108"			
120"			
132"			
144"			



Section View
Base configuration for 96"



Section View
Base configuration for 108"-144"

Materials & Features

CONCRETE: 5,000 PSI in 28 days.

REINFORCING STEEL: per ASTM A-615 / A-185

REINFORCING to meet AASHTO HS 20-44 Loading.

BASE DESIGN EQUAL TO OR EXCEEDS ASTM C-357

RISER DESIGN EQUAL TO OR EXCEEDS ASTM C-478

(A). Hatches as specified by Engineer.

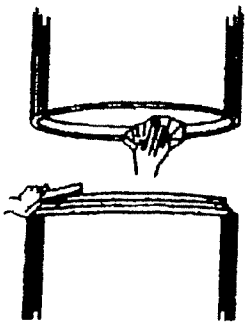
In the event a boot is loose contact your Hanson representative to resolve.

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE
Typical Wetwells - Various Diameters	All Plants	TX	5.13	08-15-06

Hanson

① "O"-Ring Gasket

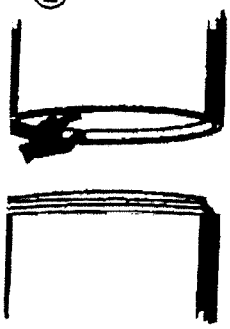


Carefully clean all dirt & foreign objects from the joining surface of the bell or groove end of pipe.

Carefully clean spigot or tongue end of pipe, including the gasket recess. Inspect the bell and spigot ends of each section to make sure they are free from cracks, chips or voids that will interfere with gasket.

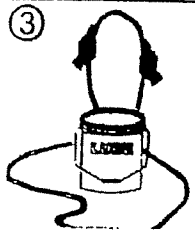
Improperly prepared bell and spigot surfaces may prevent homing of the pipe or keep the gasket from sealing.

②



Lubricate bell joint surface liberally, covering entire inside surface using proper pipe gasket lubricant.

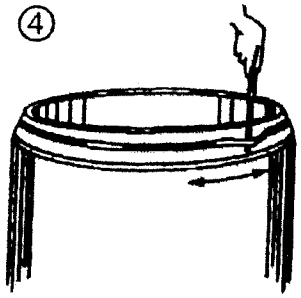
③



Lubricate the gasket throughly before it is placed on the spigot or tongue.

Bell and Gasket not lubricated or improperly lubricated may cause the gasket to roll and leak or possibly damage the bell.

④

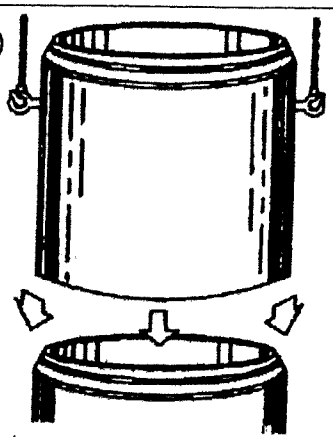


****IMPORTANT****

Fit the gasket carefully, equalizing the rubber gasket stretch by running a smooth, round object (inserted between the gasket & spigot) around the entire circumference several times.

Unequal stretch could cause bunching of the gasket and may cause leaks in the joint or crack the bell.

⑤



Align the bell & spigot to be joined. Before homing the joint, check that the gasket is in contact with the bell end entrance taper around the entire circumference.

Do not force sections together. If sections do not seat properly, unstack and contact your Hanson Sales Representative.

Improper alignment can dislodge gasket, causing leaks or possibly breaking the bell.

Profile Gasket

1. Manhole sections should be handed with extreme caution to avoid chipping of the bell or spigot ends. Proper lifting devices must be used on all sections.
2. Inspect gasket sealing area for any voids or rough edges that may interfere with the seal.
3. Place the 4-G Gasket in the step of the spigot. (Making sure that the pointed end of the gasket is toward the end of the pipe as shown in Fig A.)
4. ****IMPORTANT**** Equalize the stretch on the gasket by pulling the sealing lube away from the spigot at least one inch and then releasing the gasket. Repeat this every three or four inches around the circumference of the pipe. Equalization of stretch makes sure that the gasket has the same stretched cross-section and tension throughout. **Do not lube the gasket or spigot end of the pipe.**
5. Remove all dirt and other foreign matter from the inside surface of the bell. Apply lube to the inner surface of the bell including the lead-in taper surface on the outer edge of the bell. Align spigot with the bell. Gasket should touch lead-in taper around the entire circumference before pushing the pipe home.
6. Push the manhole section carefully, until the spigot is all the way home. (Fig B) Do not force sections together. If sections do not seat properly, unstack and contact your Hanson Sales Representative.
7. Every manhole will not come home exactly the same. Differences in application, consistency of lubricants, dimensions in the spigot and groove will cause variations in installation. If joining problems arise, please contact the manhole manufacturer immediately rather than forcing manhole sections together with subsequent damage to the manhole.
8. All testing should be performed prior to backfill of the manhole. Problems can not be detected after the manhole is backfilled. **Testing the manhole after backfill voids all warranties.**

Fig. A

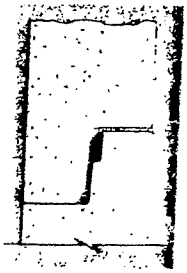
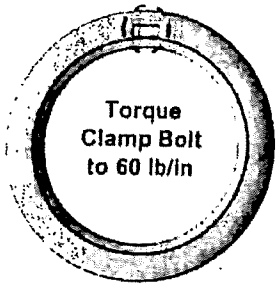


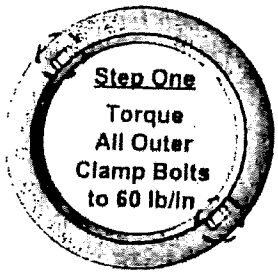
Fig. B

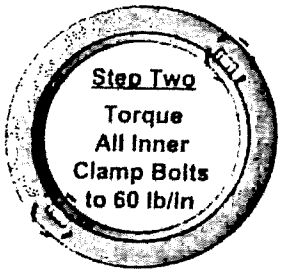
Note: Manholes in excess of 30' in depth must be vacuum tested prior to backfill. The loads presented by soils and possible groundwater at 30' in addition to the load from the vacuum may exceed the design capacity of the pipe to manhole connector.

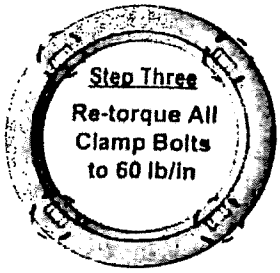
TITLE	PLANT	STATE	SECTION.PAGE	DATE	
O-Ring & Profile Gasket Installation on Manholes	All Plants	TX	5.14	08-15-06	Hanson



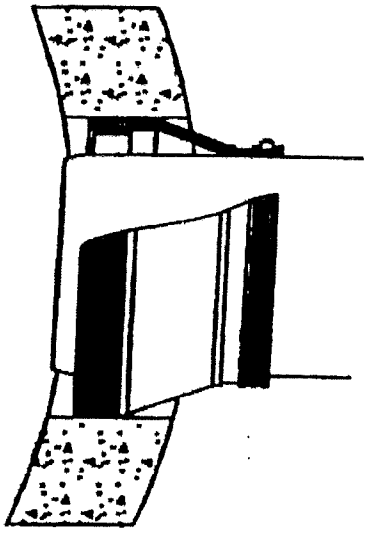
Single Clamp







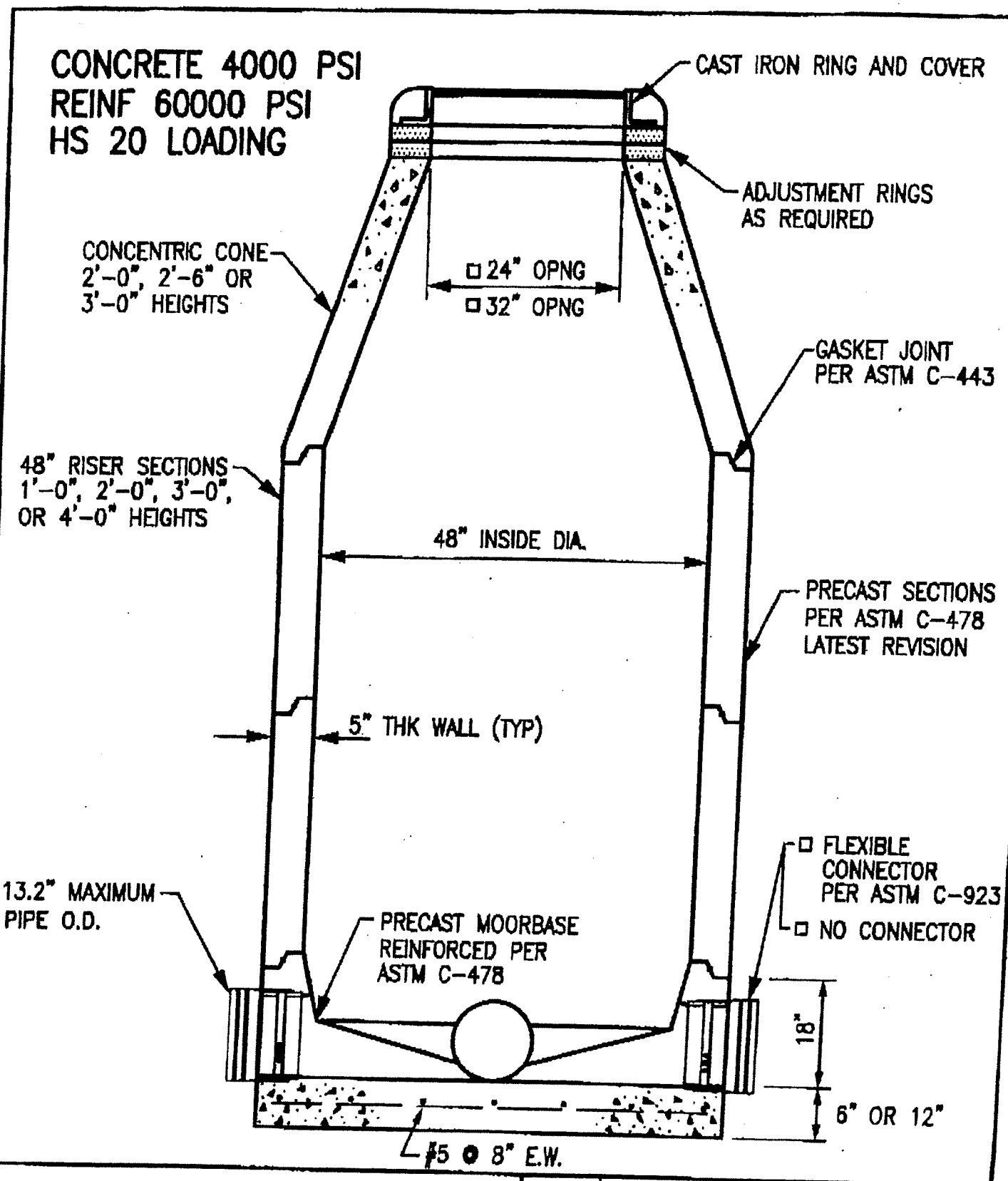
Multiple Clamps



Instructions

1. Clean pipe and boot to ensure no dirt or foreign materials are present.
2. Clamping surface on pipe must be clean and smooth.
3. Center pipe in opening and insert until pipe is at least equal to the inside plane of the manhole.
4. Attach take-up clamps(s) and stagger screw(s) of clamps(s) around the groove of the gasket so that take-up pressure will be equalized. Make sure each clamp is completely in the correct groove.
5. Using a torque ratchet or torque wrench, gradually tighten all screw(s) of clamp(s) in an alternating pattern to 60 lbs/in torque.
6. After reaching 60 lbs/in torque on final screw, check all screws again to ensure equal compression of all clamps.
7. If system is to be tested, testing shall be completed prior to backfilling, following all recommendations and requirements of the test system manufacturer. Vacuum testing shall be conducted in accordance with ASTM C-1244.
8. Adjust pipe to line and grade. Use proper bedding, backfill materials and techniques so that pipe deflection and deformation is minimized.
9. Any pipe stubs installed in the manhole must be positively restrained from movement.
10. Vacuum testing after backfill voids warranty.

For more information contact yor local Hanson Representative.



Rinker MATERIALS Moor-Tex
2735 HWY. 36 NORTH
MAILING: P.O. BOX 1088
SEALY, TEXAS 77474
PH: (979) 885-7403
(281) 375-6121
FAX:(979) 885-7001

REV.	DESCRIPTION	DATE
DATE: 8-09-02	SCALE: 3/4"=1'-0"	BY: RB

48" PRECAST CONCENTRIC MANHOLE WITH MOORBASE

JOB: 2002

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: Jocelyn Perez, P.E.

Date: 6/26/2024

Signature of Customer/Agent:

Regulated Entity Name: Veramendi S8-S10

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: 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

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. https://www.tceq.texas.gov/response/spills/spill_rq.html
- 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.

- 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

Attachment B – Potential Sources of Contamination

Other potential sources of contamination during construction include:

Potential Source	●	Asphalt products used on this project.
Preventative Measure	■	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.
Potential Source	●	Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle dripping.
Preventative Measure	■	Vehicle maintenance when possible will be performed within the construction staging area.
	■	Construction vehicles and equipment shall be checked regularly for leaks and repaired immediately.
Potential Source	●	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.
Preventative Measure	■	Contractor to incorporate into regular safety meetings, a discussion of spill prevention and appropriate disposal procedures.
	■	Contractor's superintendent or representative overseer shall enforce proper spill prevention and control measures.
	■	Hazardous materials and wastes shall be stored in covered containers and protected from vandalism.
	■	A stockpile of spill cleanup materials shall be stored on site where it will be readily accessible.
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

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 clearing and grubbing of vegetation where applicable to include additional grading outside of the sewer alignment. This will disturb approximately 2.41 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 10.9 acres as noted by the 50' sewer envelope.

ATTACHMENT D

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.

Upgradient water crossing the site will be intercepted by silt fence on the downstream side of the site.

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 (4) 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.

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.

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

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

Attachment G – Drainage Area Map

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

ATTACHMENT I

INSPECTIONS

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 S8-S10
Sewage Collection System Plan

Pollution Prevention Measure	Inspected in 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."

Inspector's Name _____ Inspector's Signature _____ Date _____

PROJECT MILESTONE DATES

Date when major site grading activities begin:

Construction Activity	Date
Installation of BMPs	

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

Construction Activity	Date

Dates when stabilization measures are initiated:

Stabilization Activity	Date
Removal of BMPs	

ATTACHMENT J

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)

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

I Garrett Mechler,
Print Name

VP, Operations,
Title - Owner/President/Other

of Veramendi PE – Cairns, LLC,
Corporation/Partnership/Entity Name

have authorized **Pape-Dawson Consulting Engineers, LLC.**
Print Name of Agent/Engineer

of **Pape-Dawson Consulting Engineers, LLC.**
Print Name of Firm

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

I also understand that:

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

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

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

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

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

SIGNATURE PAGE:

Applicant's Signature

5/20/2024
Date

THE STATE OF Texas §

County of Comal §

ALEX HARDEMAN
Notary Public, State of Texas
Comm. Expires 05-20-2028
Notary ID 130670969

BEFORE ME, the undersigned authority, on this day personally appeared Garrett Mechler 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 20 day of May 2024.

NOTARY PUBLIC

Alex Hardeman
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 5/20/2028

Owner Authorization Form

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

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

Land Owner Authorization

I, Garrett Mechler of Veramendi PE – Brisbane, LLC
Land Owner Name (Individual) Firm (applicable to Legal Entities)

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

A- 3 SUR- 2 J M VERAMENDI, ACRES 0.6300, A- 3 SUR- 2 J M VERAMENDI, ACRES 0.7590

(Legal description of the property referenced in the application)

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

Veramendi PE - Cairns, LLC

(Applicant Name / Plan Holder (Legal Entity or Individual))

to conduct:

Sewer line construction and associated grading

(Description of the proposed regulated activities)

on the property described above or at:

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

Land Owner Acknowledgement

I, Garrett Mechler of Veramendi PE – Brisbane, LLC
Land Owner Name (Individual) Firm (applicable to Legal Entities)

understand that while Veramendi PE - Cairns, LLC
Applicant Name / Plan Holder (Legal Entity or Individual)

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

I, Garrett Mechler of Veramendi PE – Brisbane, LLC

Land Owner Name (Individual) Firm (applicable to Legal Entities)

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

I, Garrett Mechler of Veramendi PE – Brisbane, LLC

Land Owner Name (Individual) Firm (applicable to Legal Entities)

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

Land Owner Signature

Land Owner Signature

8/9/2024
Date

THE STATE OF § Texas

County of § Comal

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

GIVEN under my hand and seal of office on this 9 day of August, 2024

ALEX HARDEMAN
Notary Public, State of Texas
Comm. Expires 05-20-2028
Notary ID 130670969

Alex Hardeman
NOTARY PUBLIC

Alex Hardeman
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 5/20/2028

Attached: (Mark all that apply)

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

Applicant Acknowledgement

I, Garrett Mechler of Veramendi PE – Cairns, LLC
Applicant Name (Individual) Firm (applicable to Legal Entities)

acknowledge that Veramendi PE – Brisbane, LLC
Land Owner Name (Legal Entity or Individual)

has provided Veramendi PE – Cairns, LLC
Applicant Name (Legal Entity or Individual)

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

I understand that Veramendi PE – Cairns, LLC
Applicant Name (Legal Entity or Individual)

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

Applicant Signature

Applicant Signature

8/9/2024
Date

THE STATE OF § Texas

County of § Comal

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

GIVEN under my hand and seal of office on this 9 day of August, 2024.

ALEX HARDEMAN
Notary Public, State of Texas
Comm. Expires 05-20-2028
Notary ID 130670969

Alex Hardeman
NOTARY PUBLIC

Alex Hardeman
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 5/20/2028

201706013192 03/14/2017 11:42:33 AM 1/13

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

SPECIAL WARRANTY DEED WITH VENDOR'S LIEN

Effective Date: March 2, 2017

Grantor: WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP, a Texas limited partnership

Grantor's Mailing Address: Mr. Dean Word III
PO Box 310330
New Braunfels, Texas 78131

Grantee: Veramendi PE – Brisbane, LLC, a Texas limited liability company

Grantee's Mailing Address: 177 W. Mill Street, Suite 200
New Braunfels, TX 78131

Consideration:

Ten and No/100 Dollars ($10.00) cash and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by Grantor, including without limitation that certain Promissory Note (the "Note") of even date executed by Grantee and payable to the order of Grantor in the original principal amount of Two Million, Seven Hundred Thirty-Eight Thousand, Twenty and 86/100 Dollars ($2,738,020.86), bearing interest at the rate therein provided, said Note containing the usual reasonable attorneys' fee clause and various acceleration of maturity clauses in case of default. The Note is secured by a Vendor's Lien and superior title retained in this Deed and by a Deed of Trust and Security Agreement (With Assignment of Rents) of even date from Grantee to Georgia B. Duettra, Trustee, which are secondary, subordinate and inferior only to the liens securing that certain promissory note of even date herewith in the original principal amount of Four Million, Eight Hundred Twenty Thousand Dollars ($4,820,000.00) which is payable by Grantee to The First National Bank of Beeville.

Property (including any improvements):

That certain tract of land containing approximately two hundred fifty-five and 715/1000 (255.715) acres located in Comal County, Texas, that is more particularly described in **Exhibit A**.

Reservations from Conveyance:

SAVE AND EXCEPT, HOWEVER, and there is hereby RESERVED unto Grantor, its successors and assigns the following:

(a) all groundwater in or under the Property and all groundwater rights associated with said groundwater, but no surface rights to explore or extract such water;

(b) all ranch improvements on or in the Property as of the Effective Date, including all houses, barns, sheds, fences, gates, windmills, water well equipment, including pipes and submergible pumps, and water distribution lines (the "Retained Improvements"), provided, however, that Grantor shall have a period of thirty (30) days following the Effective Date (the "Removal Period") to enter the Property and remove the Retained Improvements, it being understood that any Retained Improvements which are not removed from the Property by Grantor prior to the expiration of the Removal Period shall become the property of Grantee and Grantor shall have no further claim thereto.

Exceptions to Conveyance and Warranty:

The conveyance and warranties of title herein are expressly made subject to the exceptions, easements, restrictive covenants, conditions and encumbrances set forth on **Exhibit B** attached hereto and incorporated herein for all purposes (the "Permitted Exceptions").

Grantor, for the Consideration and subject to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty, GRANTS, SELLS, and CONVEYS to Grantee the Property, together with all and singular the rights and appurtenances thereto in any way belonging, to have and to hold it to Grantee and Grantee's heirs, successors, and assigns forever. Grantor binds Grantor and Grantor's heirs and successors to warrant and forever defend all and singular the Property to Grantee and Grantee's heirs, successors, and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof when the claim is by, through, or under Grantor but not otherwise.

EXCEPT AS SET FORTH IN (A) THAT CERTAIN OPTION AGREEMENT DATED SEPTEMBER 14, 2015 BY AND BETWEEN VERAMENDI DEVELOPMENT COMPANY, LLC AND GRANTOR, AS LANDOWNER (THE "OPTION AGREEMENT"), AND (B) THIS SPECIAL WARRANTY DEED WITH VENDOR'S LIEN, THE PROPERTY IS CONVEYED AND TRANSFERRED TO GRANTEE "AS IS, WHERE IS AND WITH ALL FAULTS". GRANTOR DOES NOT WARRANT OR MAKE ANY REPRESENTATION, EXPRESS OR IMPLIED, AS TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, QUANTITY, QUALITY, PHYSICAL CONDITION OR ANY OTHER MATTER AFFECTING THE PROPERTY. INFORMATION PROVIDED OR TO BE PROVIDED BY GRANTOR IN RESPECT OF THE PROPERTY WAS OBTAINED FROM A VARIETY OF SOURCES. EXCEPT AS EXPRESSLY PROVIDED OTHERWISE HEREIN, GRANTOR HAS NOT MADE AN INDEPENDENT INVESTIGATION OF SUCH INFORMATION AND

MAKES NO REPRESENTATIONS AS TO THE ACCURACY OR COMPLETENESS THEREOF. IN THIS REGARD, GRANTEE ACKNOWLEDGES THAT (A) GRANTEE DID NOT ENTER INTO THE OPTION AGREEMENT IN RELIANCE UPON ANY INFORMATION GIVEN TO GRANTEE PRIOR TO THE EFFECTIVE DATE THEREOF, INCLUDING, BUT NOT LIMITED TO, PROMOTIONAL MATERIALS OR FINANCIAL DATA, (B) GRANTEE MADE ITS DECISION TO PURCHASE THE PROPERTY BASED UPON GRANTEE'S OWN DUE DILIGENCE AND INVESTIGATIONS, (C) GRANTEE HAS SUFFICIENT KNOWLEDGE AND EXPERIENCE IN REAL ESTATE INVESTMENT TO EVALUATE THE MERITS AND RISKS OF THE TRANSACTIONS PROVIDED IN THE OPTION AGREEMENT, AND (D) GRANTEE IS FINANCIALLY ABLE TO BEAR THE ECONOMIC RISK OF THE LOSS OF SUCH INVESTMENT AND THE COST OF THE DUE DILIGENCE AND INVESTIGATIONS UNDER THE OPTION AGREEMENT. IT IS UNDERSTOOD AND AGREED THAT THE PURCHASE PRICE HAS BEEN ADJUSTED BY PRIOR NEGOTIATION TO REFLECT THAT THE PROPERTY IS BEING SOLD BY GRANTOR AND PURCHASED BY GRANTEE SUBJECT TO THE FOREGOING.

Taxes for the current year have been prorated and their payment is assumed by Grantee.

The use of any pronoun herein to refer to Grantor or Grantee shall be deemed a proper reference even though Grantor and/or Grantee may be an individual (either male or female), a corporation, a partnership or a group of two or more individuals, corporations and/or partnerships, and when this Deed is executed by or to a corporation, or trustee, the words "heirs, executors and administrators" or "heirs and assigns" shall, with respect to such corporation or trustee, be construed to mean "successors and assigns".

The Vendor's Lien is retained in favor of the payee of the Note against the above-described property, premises and improvements, until the Note and all interest thereon shall have been fully paid according to the terms thereof, when this Deed shall become absolute.

Grantor acknowledges and agrees that (a) it previously filed Restrictive Covenants dated January 29, 2016 and recorded as Document No. 201606009472 of the real property records of Comal County, Texas (the "Restrictive Covenants"), (b) the Restrictive Covenants prohibit, on the Restricted Property (as that term is defined in the Restrictive Covenants) and for the benefit of the Benefited Property (as that term is defined in the Restrictive Covenants), uses that are noxious or which have a materially adverse effect on the Development (as that term is defined in that certain Company Agreement of Veramendi Development Company, LLC dated September 14, 2015), as described further in the Restrictive Covenants, (c) Veramendi PE – Brisbane, LLC is an affiliate of Veramendi PE – Adelaide, LLC, as contemplated by Section 3 of the Restrictive Covenants, and (d) consequently for the purpose of the Restrictive Covenants, the above-described Property hereby is removed from the Restricted Property and now is included within the Benefited Property.

[SIGNATURES BEGIN ON NEXT PAGE]

EXECUTED to be EFFECTIVE as of the Effective Date.

GRANTOR:

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: _____
Amber Word-Heisner, Manager

By: _____
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

ACKNOWLEDGMENT

STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was sworn, subscribed, and acknowledged before me on March 2nd, 2017 by Timothy Dean Word, III, Manager of Word-Borchers Ranch Management Company, L.L.C., as general partner of Word-Borchers Ranch Real Estate Limited Partnership, a Texas limited partnership, on behalf of said limited liability company and limited partnership.

_____
Notary Public, State of Texas

JENANE ROGERS
My Notary ID # 8055392
Expires February 3, 2019

Jenane Rogers
(Name - Typed or Printed)

2-3 2019
(My Commission Expires)

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: _____
Amber Word-Heisner, Manager

By: _____
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF Los Angeles

On March 2, 2017, before me, Amber Word-Heisner, Manager of Word-Borchers Ranch Management Company, LLC, a Texas limited liability company, as general partner of Word-Borchers Ranch Real Estate Limited Partnership, on behalf of said limited liability company and limited partnership, personally appeared to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that she executed the same in her authorized capacity, and that by her signature on the instrument the entity upon behalf of which the person acted executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

JAMES PATRICK SULLIVAN II
NOTARY PUBLIC - CALIFORNIA
LOS ANGELES COUNTY
COMMISSION # 2053760
MY COMM. EXPIRES JAN. 22, 2018

_____
Notary Public in and for the State of California

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: _____
Amber Word-Heisner, Manager

By: _____
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was acknowledged before me on March 2nd, 2017 by Marcia Borchers McGlothlin, Manager of Word-Borchers Ranch Management Company, L.L.C., as general partner of Word-Borchers Ranch Real Estate Limited Partnership, a Texas limited partnership, on behalf of said limited liability company and limited partnership.

_____
Notary Public, State of Texas

Jenane Rogers
(Name - Typed or Printed)

2-3-2019
(My Commission Expires)

JENANE ROGERS
My Notary ID # 8055392
Expires February 3, 2019

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: _____
Amber Word-Heisner, Manager

By: _____
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

STATE OF NEW MEXICO

COUNTY OF Santa Fe

This instrument was acknowledged before me on March 2, 2017, by Georgia Borchers Duettra, as Manager of Word-Borchers Ranch Management Company, LLC, a Texas limited liability company, as general partner of Word-Borchers Ranch Real Estate Limited Partnership, on behalf of said limited liability company and limited partnership.

DOUGLAS G. MCCUISTION NOTARY PUBLIC STATE OF NEW MEXICO

_____
Notary Public in and for the State of New Mexico
My commission expires: 10-23-18

GRANTEE:

Veramendi PE – Brisbane, LLC,

By: Veramendi Development Co, LLC, its Manager

By: ASA Properties, LLC, its Manager

By: ASA Properties Holding Co., LLC, its Manager

By: _____

Peter James, Manager and sole signatory pursuant to Unanimous Consent in Lieu of a Special Meeting of the Managers of ASA Properties Holding Co., LLC, dated November 30, 2016

STATE OF TEXAS §
§ **CORPORATE ACKNOWLEDGMENT**
COUNTY OF TRAVIS §

This instrument was acknowledged before me on this the 2nd day of March 2017, by Peter James, a person known to me in his capacity as Manager of ASA Properties Holding Co., LLC, the sole manager of ASA Properties, LLC, the sole Manager of Veramendi Development Company, LLC, the sole manager of Veramendi PE – Brisbane, LLC, on behalf of Veramendi PE – Brisbane, LLC.

DEBBIE L. DANIELS
NOTARY PUBLIC
ID# 190254-2
State of Texas
Comm. Exp. 08-02-2019

Debbie L. Daniels
Notary Public, in and for the State of Texas

AFTER RECORDING RETURN TO:
Veramendi PE – Brisbane, LLC
177 W. Mill Street, Suite 200
New Braunfels, Texas 78131

HMT
ENGINEERING & SURVEYING

410 N. Seguin Ave.
New Braunfels, TX 78130
HMTNB.COM
830.625.8555 - FAX: 830.625.8556
TBPE FIRM F-10961

METES AND BOUNDS DESCRIPTION
FOR A
255.715 ACRE TRACT OF LAND

Being a 255.715 acre tract of land out of the J.M. Veramendi Survey No. 1, Abstract No. 2, Comal County, Texas, being a portion of the remainder tract of a called 2086 acre tract of land, described in Document Number 201006024825, Official Public Records, Comal County, Texas, said 255.715 acre tract of land being more particularly described as follows:

BEGINNING at a point in the Southwesterly line of said called 2086 acre tract, for the North corner of Oak Run Subdivision Unit 21, recorded in Document Number 201206032242, Map and Plat Records, Comal County, Texas, and the East corner of the remainder of a called 218.15 acre tract, recorded in Volume 244, Page 646, Official Public Records, Comal County, Texas;

THENCE along the Southwesterly line of said remainder of called 2086 acre tract, common with the Northeasterly line of said remainder of called 218.15 acre tract, N 39°15'17" W a distance of 7.94 feet to a point for the Northwesterly corner of the herein described tract;

THENCE across said remainder of called 2086 acre tract, the following forty-three (43) calls:

1. N 52°26'23" E a distance of 1176.53 feet to a point for a corner;
2. Along a curve to the right having a radius of 1450.00 feet, an arc length of 42.54 feet, a central angle of 01°40'51", and a chord bearing and distance of N 53°16'48" E, 42.54 feet to a point for a corner;
3. N 68°39'25" E a distance of 51.22 feet to a point for a corner;
4. Along a curve to the right having a radius of 1438.00 feet, an arc length of 395.92 feet, a central angle of 15°46'30", and a chord bearing and distance of N 63°59'01" E, 394.67 feet to a point for a corner;
5. S 60°46'40" E a distance of 69.02 feet to a point for a corner;
6. N 68°49'36" E a distance of 98.68 feet to a point for a corner;
7. N 32°09'28" E a distance of 68.73 feet to a point for a corner;
8. Along a curve to the right having a radius of 1450.00 feet, an arc length of 513.06 feet, a central angle of 20°16'24", and a chord bearing and distance of N 89°51'48" E, 510.39 feet to a point for a corner;
9. S 80°00'00" E a distance of 1050.23 feet to a point for a corner;
10. S 03°53'04" E a distance of 218.72 feet to a point for a corner;
11. S 00°02'17" E a distance of 224.73 feet to a point for a corner;
12. S 22°13'23" W a distance of 402.48 feet to a point for a corner;
13. S 06°06'32" W a distance of 256.94 feet to a point for a corner;
14. S 33°54'08" W a distance of 311.60 feet to a point for a corner;
15. S 21°07'01" W a distance of 208.73 feet to a point for a corner;
16. S 20°46'40" W a distance of 77.68 feet to a point for a corner;
17. S 73°30'00" E a distance of 709.87 feet to a point for a corner;

18. Along a curve to the left having a radius of 1237.00 feet, an arc length of 120.55 feet, a central angle of 05°35'02", and a chord bearing and distance of S 76°17'31" E, 120.50 feet to a point for a corner;
19. N 53°47'30" E a distance of 41.32 feet to a point for a corner;
20. S 89°44'43" E a distance of 98.68 feet to a point for a corner;
21. S 39°35'41" E a distance of 68.75 feet to a point for a corner;
22. S 00°02'51" E a distance of 98.10 feet to a point for a corner;
23. Along a curve to the left having a radius of 1343.00 feet, an arc length of 82.43 feet, a central angle of 03°31'00", and a chord bearing and distance of S 89°16'07" E, 82.42 feet to a point for a corner;
24. N 88°58'23" E a distance of 728.11 feet to a point for a corner;
25. S 77°31'52" E a distance of 51.42 feet to a point for a corner;
26. N 88°58'23" E a distance of 250.55 feet to a point for a corner;
27. S 48°09'43" E a distance of 73.29 feet to a point for a corner;
28. Along a curve to the left having a radius of 1075.00 feet, an arc length of 732.04 feet, a central angle of 39°00'59", and a chord bearing and distance of S 26°07'58" E, 717.98 feet a point for a corner;
29. S 32°58'37" E a distance of 50.00 feet to a point for a corner;
30. S 47°37'38" E a distance of 66.22 feet to a point for a corner;
31. S 29°44'20" W a distance of 166.71 feet to a point for a corner;
32. S 53°40'25" W a distance of 209.97 feet to a point for a corner;
33. S 72°48'06" W a distance of 178.52 feet to a point for a corner;
34. S 29°00'49" W a distance of 222.76 feet to a point for a corner;
35. S 57°22'23" W a distance of 60.14 feet to a point for a corner;
36. Along a curve to the right having a radius of 1157.00 feet, an arc length of 76.82 feet, a central angle of 03°48'15", and a chord bearing and distance of S 60°45'52" W, 76.81 feet to a point for a corner;
37. S 62°40'00" W a distance of 165.41 feet to a point for a corner;
38. S 69°47'13" W a distance of 222.58 feet to a point for a corner;
39. S 45°36'15" W a distance of 239.27 feet to a point for a corner;
40. S 51°41'55" E a distance of 406.28 feet to a point for a corner;
41. Along a curve to the right having a radius of 863.00 feet, an arc length of 228.05 feet, a central angle of 15°08'26", and a chord bearing and distance of S 44°07'42" E, 227.39 feet to a point for a corner;
42. S 36°33'29" E a distance of 1008.91 feet to a point for a corner;
43. S 81°33'29" E a distance of 42.43 feet to a point in the Northwesterly right-of-way line of Loop 337, for a Southeasterly corner of the herein described tract;

THENCE along the Northwesterly right-of-way line of Loop 337, S 53°26'31" W a distance of 186.00 feet to a point for a corner;

THENCE continuing across said called 2086 acre tract, the following eight (8) calls:

1. N 08°26'31" E a distance of 42.43 feet to a point for a corner;
2. N 36°33'29" W a distance of 1008.91 feet to a point for a corner;
3. Along a curve to the left having a radius of 737.00 feet, an arc length of 194.75 feet, a central angle of 15°08'26", and a chord bearing and distance of N 44°07'42" W, 194.19 feet to a point for a corner;

4. N 51°41'55"W a distance of 345.82 feet to a point for a corner;
5. S 44°51'12" W a distance of 89.36 feet to a point for a corner;
6. S 54°38'59" W a distance of 442.34 feet to a point for a corner;
7. Along a curve to the left having a radius of 300.00 feet, an arc length of 160.48 feet, a central angle of 30°38'59", and a chord bearing and distance of S 39°19'29" W, 158.57 feet to a point for a corner;
8. S 24°00'00" W a distance of 762.50 feet to a point in the Southwesterly line of said called 2086 acre tract, common with the Northeasterly line of Oak Run Commercial Reserve Unit Eight, recorded in Document Number 200106003623, Map and Plat Records, Comal County, Texas, and a Southwest corner of the herein described tract;

THENCE along the Northeasterly line of said Oak Run Commercial Reserve Unit Eight, N 37°34'12" W a distance of 9.24 feet to a point for the North corner of said Oak Run Commercial Unit Eight and the East corner of Oak Run Commercial Unit Seven, recorded in Document Number 200206005209, Map and Plat Records, Comal County, Texas;

THENCE along the Northeasterly line of said Oak Run Commercial Unit Seven, N 37°34'47" W a distance of 369.59 feet to a point for the North corner of said Oak Run Commercial Unit Seven and the East corner of Oak Run Subdivision Unit 14, Recorded in Document Number 200606032712, Map and Plat Records, Comal County, Texas;

THENCE along the Northeasterly line of said Oak Run Subdivision Unit 14, N 37°36'44" W a distance of 1629.58 feet to a point for the North corner of said Oak Run Subdivision Unit 14, and the East corner of Oak Run Subdivision Unit Eleven, recorded in Document Number 9806024554, Map and Plat Records, Comal County, Texas;

THENCE along the Northeasterly line of said Oak Run Subdivision Unit Eleven, N 37°28'58" W a distance of 242.96 feet to a point for a corner;

THENCE continuing along the Northeasterly line of said Oak Run Subdivision Unit Eleven, and the Northeasterly line of Oak Run Subdivision Unit Ten, recorded in Document Number 9806013415, Map and Plat Records, Comal County, Texas, N 37°37'26" W a distance of 745.19 feet to a point for the North corner of said Oak Run Subdivision Unit Ten and the East corner of Oak Run Subdivision Unit Nine, recorded in Document Number 9806011099, Map and Plat Records, Comal County, Texas;

THENCE along the Northeast line of said Oak Run Subdivision Unit Nine, N 37°37'26" W a distance of 415.85 feet to a point for the North corner of said Oak Run Subdivision Unit Nine and the East corner of aforementioned Oak Run Subdivision Unit 21;

THENCE along the Northeasterly line of said Oak Run Subdivision Unit 21, the following four (4) calls:

1. N 37°38'22" W a distance of 459.79 feet to a point for a corner;
2. N 37°36'27" W a distance of 656.17 feet to a point for a corner;
3. N 37°21'34" W a distance of 315.93 feet to a point for a corner;
4. N 37°22'34" W a distance of 317.95 feet to the POINT OF BEGINNING and containing 275.212 acres of land, SAVE & EXCEPT 19.497 acres of land being all of a called 19.135

acre tract recorded in Document Number 201606012287, Official Public Records, Comal County, Texas and a 0.362 acre portion of a called 19.497 acre tract recorded in Document Number 201606009473, Official Public Records, Comal County, Texas, leaving a net acreage of 255.715 acres of land in Comal County, Texas.

Bearings, distances and areas shown herein are based upon the Veramendi Master Exhibit, dated July 26, 2016 as provided to HMT.

This description is based solely upon recorded deed(s) and a preliminary Master Plan. This does not reflect the results of an on-the-ground survey and is subject to change based upon actual fieldwork and/or changes to the Master Plan.

S:\Projects\216 - ASA Properties\001 - Brisbane 2A - 256.3acres – Veramendi
\101 - Boundary & Improvement\MB_255.715 AC_TN_9-13-16.docx

EXHIBIT B TO SPECIAL WARRANTY DEED WITH VENDOR'S LIEN

PERMITTED EXCEPTIONS

1. Easement granted to Comal County, by instrument dated June 26, 1970, recorded in Volume 179, Page 689 of the Official Public Records of Comal County, Texas.

2. Easement for highway purposes granted to the State of Texas, by instrument dated May 10, 1963, recorded in Volume 133, Page 464, of the Deed Records of Comal County, Texas.

3. The terms, conditions and stipulations of that certain Oil, Gas and Mineral Lease dated May 21, 1981, recorded in Volume 322, Page 254 of the Official Public Records of Comal County, Texas.

4. Sewer line agreement dated August 29, 1986, recorded in Volume 529, Page 566, of the Official Public Records of Comal County, Texas.

5. The terms, conditions and stipulations of that certain Lease Agreement to San Antonio Cellular Telephone Company, as Lessee, dated October 14, 1986, recorded in Volume 536, Page 78, of the Official Public Records of Comal County, Texas, and being further assigned to AT&T Technologies, Inc., by instrument recorded in Volume 537, Page 583, of the Official Public Records of Comal County, Texas.

6. Easement to New Braunfels Utilities for electric, water and sewer lines as set out in instrument recorded in Volume 746, Page 515, of the Official Public Records of Comal County, Texas.

7. Sewer line easement granted to the City of New Braunfels (Utilities), by instrument dated December 30, 1994, recorded in Volume 1018, Page 730, of the Official Public Records of Comal County, Texas.

8. Right of Use granted to Southwestern Bell Telephone Company, by instrument filed December 30, 1994, recorded in Instrument No. 9606018259, of the Official Public Records of Comal County, Texas.

9. Drainage Easement Agreement executed by and between Word-Borchers Ranch Real Estate Limited Partnership and Oakwood Baptist Church of New Braunfels, Texas, filed December 12, 2012, in Instrument No. 201206043815, of the Official Public Records of Comal County, Texas.

10. Strategic Partnership Agreement between the City of New Braunfels, Texas and the Comal County Water Improvement District No. 1, effective July 24, 2015, filed July 24, 2015, in Instrument No. 201506029553, Official Public Records of Comal County, Texas.

11. Development Agreement between City of New Braunfels and Word-Borchers Ranch Joint Venture for Proposed Mixed Use Development recorded July 24, 2015, in Instrument No. 201506029547, Official Public Records of Comal County, Texas. Said agreement modified by First Amendment recorded July 24, 2015, in Instrument No. 201506029548; Second Amendment recorded July 24, 2015, in Instrument No. 201506029549; Third Amendment recorded July 24, 2015, in Instrument No. 201506029550; Fourth Amendment recorded July 24, 2015, in Instrument No. 201506029551; Fifth Amendment recorded July 24, 2015, in Instrument No. 201506029552.

12. Utility Construct Cost Sharing Agreement for the Veramendi Development recorded July 24, 2015, in Instrument No. 201506029554, Official Public Records of Comal County, Texas.

13. NBU Electric Easement executed September 27, 2016, recorded October 7, 2016, in Instrument No. 201606038346, of the Official Public Records of Comal County, Texas

Filed and Recorded
Official Public Records
Bobbie Koepp, County Clerk
Comal County, Texas
03/14/2017 11:42:33 AM
CHRISTY 13 Page(s)
201706013192

Bobbie Koepp

201706013192 03/14/2017 11:42:33 AM 1/13

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

SPECIAL WARRANTY DEED WITH VENDOR'S LIEN

Effective Date: March 2, 2017

Grantor: WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP, a Texas limited partnership

Grantor's Mailing Address: Mr. Dean Word III
PO Box 310330
New Braunfels, Texas 78131

Grantee: Veramendi PE – Brisbane, LLC, a Texas limited liability company

Grantee's Mailing Address: 177 W. Mill Street, Suite 200
New Braunfels, TX 78131

Consideration:

Ten and No/100 Dollars ($10.00) cash and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by Grantor, including without limitation that certain Promissory Note (the "Note") of even date executed by Grantee and payable to the order of Grantor in the original principal amount of Two Million, Seven Hundred Thirty-Eight Thousand, Twenty and 86/100 Dollars ($2,738,020.86), bearing interest at the rate therein provided, said Note containing the usual reasonable attorneys' fee clause and various acceleration of maturity clauses in case of default. The Note is secured by a Vendor's Lien and superior title retained in this Deed and by a Deed of Trust and Security Agreement (With Assignment of Rents) of even date from Grantee to Georgia B. Duettra, Trustee, which are secondary, subordinate and inferior only to the liens securing that certain promissory note of even date herewith in the original principal amount of Four Million, Eight Hundred Twenty Thousand Dollars ($4,820,000.00) which is payable by Grantee to The First National Bank of Beeville.

Property (including any improvements):

That certain tract of land containing approximately two hundred fifty-five and 715/1000 (255.715) acres located in Comal County, Texas, that is more particularly described in **Exhibit A**.

Reservations from Conveyance:

SAVE AND EXCEPT, HOWEVER, and there is hereby RESERVED unto Grantor, its successors and assigns the following:

(a) all groundwater in or under the Property and all groundwater rights associated with said groundwater, but no surface rights to explore or extract such water;

(b) all ranch improvements on or in the Property as of the Effective Date, including all houses, barns, sheds, fences, gates, windmills, water well equipment, including pipes and submergible pumps, and water distribution lines (the "Retained Improvements"), provided, however, that Grantor shall have a period of thirty (30) days following the Effective Date (the "Removal Period") to enter the Property and remove the Retained Improvements, it being understood that any Retained Improvements which are not removed from the Property by Grantor prior to the expiration of the Removal Period shall become the property of Grantee and Grantor shall have no further claim thereto.

Exceptions to Conveyance and Warranty:

The conveyance and warranties of title herein are expressly made subject to the exceptions, easements, restrictive covenants, conditions and encumbrances set forth on **Exhibit B** attached hereto and incorporated herein for all purposes (the "Permitted Exceptions").

Grantor, for the Consideration and subject to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty, GRANTS, SELLS, and CONVEYS to Grantee the Property, together with all and singular the rights and appurtenances thereto in any way belonging, to have and to hold it to Grantee and Grantee's heirs, successors, and assigns forever. Grantor binds Grantor and Grantor's heirs and successors to warrant and forever defend all and singular the Property to Grantee and Grantee's heirs, successors, and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof when the claim is by, through, or under Grantor but not otherwise.

EXCEPT AS SET FORTH IN (A) THAT CERTAIN OPTION AGREEMENT DATED SEPTEMBER 14, 2015 BY AND BETWEEN VERAMENDI DEVELOPMENT COMPANY, LLC AND GRANTOR, AS LANDOWNER (THE "OPTION AGREEMENT"), AND (B) THIS SPECIAL WARRANTY DEED WITH VENDOR'S LIEN, THE PROPERTY IS CONVEYED AND TRANSFERRED TO GRANTEE "AS IS, WHERE IS AND WITH ALL FAULTS". GRANTOR DOES NOT WARRANT OR MAKE ANY REPRESENTATION, EXPRESS OR IMPLIED, AS TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, QUANTITY, QUALITY, PHYSICAL CONDITION OR ANY OTHER MATTER AFFECTING THE PROPERTY. INFORMATION PROVIDED OR TO BE PROVIDED BY GRANTOR IN RESPECT OF THE PROPERTY WAS OBTAINED FROM A VARIETY OF SOURCES. EXCEPT AS EXPRESSLY PROVIDED OTHERWISE HEREIN, GRANTOR HAS NOT MADE AN INDEPENDENT INVESTIGATION OF SUCH INFORMATION AND

MAKES NO REPRESENTATIONS AS TO THE ACCURACY OR COMPLETENESS THEREOF. IN THIS REGARD, GRANTEE ACKNOWLEDGES THAT (A) GRANTEE DID NOT ENTER INTO THE OPTION AGREEMENT IN RELIANCE UPON ANY INFORMATION GIVEN TO GRANTEE PRIOR TO THE EFFECTIVE DATE THEREOF, INCLUDING, BUT NOT LIMITED TO, PROMOTIONAL MATERIALS OR FINANCIAL DATA, (B) GRANTEE MADE ITS DECISION TO PURCHASE THE PROPERTY BASED UPON GRANTEE'S OWN DUE DILIGENCE AND INVESTIGATIONS, (C) GRANTEE HAS SUFFICIENT KNOWLEDGE AND EXPERIENCE IN REAL ESTATE INVESTMENT TO EVALUATE THE MERITS AND RISKS OF THE TRANSACTIONS PROVIDED IN THE OPTION AGREEMENT, AND (D) GRANTEE IS FINANCIALLY ABLE TO BEAR THE ECONOMIC RISK OF THE LOSS OF SUCH INVESTMENT AND THE COST OF THE DUE DILIGENCE AND INVESTIGATIONS UNDER THE OPTION AGREEMENT. IT IS UNDERSTOOD AND AGREED THAT THE PURCHASE PRICE HAS BEEN ADJUSTED BY PRIOR NEGOTIATION TO REFLECT THAT THE PROPERTY IS BEING SOLD BY GRANTOR AND PURCHASED BY GRANTEE SUBJECT TO THE FOREGOING.

Taxes for the current year have been prorated and their payment is assumed by Grantee.

The use of any pronoun herein to refer to Grantor or Grantee shall be deemed a proper reference even though Grantor and/or Grantee may be an individual (either male or female), a corporation, a partnership or a group of two or more individuals, corporations and/or partnerships, and when this Deed is executed by or to a corporation, or trustee, the words "heirs, executors and administrators" or "heirs and assigns" shall, with respect to such corporation or trustee, be construed to mean "successors and assigns".

The Vendor's Lien is retained in favor of the payee of the Note against the above-described property, premises and improvements, until the Note and all interest thereon shall have been fully paid according to the terms thereof, when this Deed shall become absolute.

Grantor acknowledges and agrees that (a) it previously filed Restrictive Covenants dated January 29, 2016 and recorded as Document No. 201606009472 of the real property records of Comal County, Texas (the "Restrictive Covenants"), (b) the Restrictive Covenants prohibit, on the Restricted Property (as that term is defined in the Restrictive Covenants) and for the benefit of the Benefited Property (as that term is defined in the Restrictive Covenants), uses that are noxious or which have a materially adverse effect on the Development (as that term is defined in that certain Company Agreement of Veramendi Development Company, LLC dated September 14, 2015), as described further in the Restrictive Covenants, (c) Veramendi PE – Brisbane, LLC is an affiliate of Veramendi PE – Adelaide, LLC, as contemplated by Section 3 of the Restrictive Covenants, and (d) consequently for the purpose of the Restrictive Covenants, the above-described Property hereby is removed from the Restricted Property and now is included within the Benefited Property.

[SIGNATURES BEGIN ON NEXT PAGE]

EXECUTED to be EFFECTIVE as of the Effective Date.

GRANTOR:

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: _____
Amber Word-Heisner, Manager

By: _____
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

ACKNOWLEDGMENT

STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was sworn, subscribed, and acknowledged before me on March 2nd, 2017 by Timothy Dean Word, III, Manager of Word-Borchers Ranch Management Company, L.L.C., as general partner of Word-Borchers Ranch Real Estate Limited Partnership, a Texas limited partnership, on behalf of said limited liability company and limited partnership.

_____
Notary Public, State of Texas

JENANE ROGERS
My Notary ID # 8055392
Expires February 3, 2019

Jenane Rogers
(Name - Typed or Printed)

2-3 2019
(My Commission Expires)

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: _____
Amber Word-Heisner, Manager

By: _____
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF Los Angeles

On March 2, 2017, before me, Amber Word-Heisner, Manager of Word-Borchers Ranch Management Company, LLC, a Texas limited liability company, as general partner of Word-Borchers Ranch Real Estate Limited Partnership, on behalf of said limited liability company and limited partnership, personally appeared to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that she executed the same in her authorized capacity, and that by her signature on the instrument the entity upon behalf of which the person acted executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

JAMES PATRICK SULLIVAN II
NOTARY PUBLIC - CALIFORNIA
LOS ANGELES COUNTY
COMMISSION # 2053760
MY COMM. EXPIRES JAN. 22, 2018

_____
Notary Public in and for the State of California

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: _____
Amber Word-Heisner, Manager

By: _____
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was acknowledged before me on March 2nd, 2017 by Marcia Borchers McGlothlin, Manager of Word-Borchers Ranch Management Company, L.L.C., as general partner of Word-Borchers Ranch Real Estate Limited Partnership, a Texas limited partnership, on behalf of said limited liability company and limited partnership.

_____
Notary Public, State of Texas

Jenane Rogers
(Name - Typed or Printed)

2-3-2019
(My Commission Expires)

JENANE ROGERS
My Notary ID # 8055392
Expires February 3, 2019

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: _____
Amber Word-Heisner, Manager

By: _____
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

STATE OF NEW MEXICO

COUNTY OF Santa Fe

This instrument was acknowledged before me on March 2, 2017, by Georgia Borchers Duettra, as Manager of Word-Borchers Ranch Management Company, LLC, a Texas limited liability company, as general partner of Word-Borchers Ranch Real Estate Limited Partnership, on behalf of said limited liability company and limited partnership.

DOUGLAS G. MCCUISTION NOTARY PUBLIC STATE OF NEW MEXICO

_____
Notary Public in and for the State of New Mexico
My commission expires: 10-23-18

GRANTEE:

Veramendi PE – Brisbane, LLC,

By: Veramendi Development Co, LLC, its Manager

By: ASA Properties, LLC, its Manager

By: ASA Properties Holding Co., LLC, its Manager

By: _____

Peter James, Manager and sole signatory pursuant to Unanimous Consent in Lieu of a Special Meeting of the Managers of ASA Properties Holding Co., LLC, dated November 30, 2016

STATE OF TEXAS §
§ **CORPORATE ACKNOWLEDGMENT**
COUNTY OF TRAVIS §

This instrument was acknowledged before me on this the 2nd day of March 2017, by Peter James, a person known to me in his capacity as Manager of ASA Properties Holding Co., LLC, the sole manager of ASA Properties, LLC, the sole Manager of Veramendi Development Company, LLC, the sole manager of Veramendi PE – Brisbane, LLC, on behalf of Veramendi PE – Brisbane, LLC.

DEBBIE L. DANIELS
NOTARY PUBLIC
ID# 190254-2
State of Texas
Comm. Exp. 08-02-2019

Debbie L. Daniels
Notary Public, in and for the State of Texas

AFTER RECORDING RETURN TO:
Veramendi PE – Brisbane, LLC
177 W. Mill Street, Suite 200
New Braunfels, Texas 78131

HMT
ENGINEERING & SURVEYING

410 N. Seguin Ave.
New Braunfels, TX 78130
HMTNB.COM
830.625.8555 - FAX: 830.625.8556
TBPE FIRM F-10961

METES AND BOUNDS DESCRIPTION
FOR A
255.715 ACRE TRACT OF LAND

Being a 255.715 acre tract of land out of the J.M. Veramendi Survey No. 1, Abstract No. 2, Comal County, Texas, being a portion of the remainder tract of a called 2086 acre tract of land, described in Document Number 201006024825, Official Public Records, Comal County, Texas, said 255.715 acre tract of land being more particularly described as follows:

BEGINNING at a point in the Southwesterly line of said called 2086 acre tract, for the North corner of Oak Run Subdivision Unit 21, recorded in Document Number 201206032242, Map and Plat Records, Comal County, Texas, and the East corner of the remainder of a called 218.15 acre tract, recorded in Volume 244, Page 646, Official Public Records, Comal County, Texas;

THENCE along the Southwesterly line of said remainder of called 2086 acre tract, common with the Northeasterly line of said remainder of called 218.15 acre tract, N 39°15'17" W a distance of 7.94 feet to a point for the Northwesterly corner of the herein described tract;

THENCE across said remainder of called 2086 acre tract, the following forty-three (43) calls:

1. N 52°26'23" E a distance of 1176.53 feet to a point for a corner;
2. Along a curve to the right having a radius of 1450.00 feet, an arc length of 42.54 feet, a central angle of 01°40'51", and a chord bearing and distance of N 53°16'48" E, 42.54 feet to a point for a corner;
3. N 68°39'25" E a distance of 51.22 feet to a point for a corner;
4. Along a curve to the right having a radius of 1438.00 feet, an arc length of 395.92 feet, a central angle of 15°46'30", and a chord bearing and distance of N 63°59'01" E, 394.67 feet to a point for a corner;
5. S 60°46'40" E a distance of 69.02 feet to a point for a corner;
6. N 68°49'36" E a distance of 98.68 feet to a point for a corner;
7. N 32°09'28" E a distance of 68.73 feet to a point for a corner;
8. Along a curve to the right having a radius of 1450.00 feet, an arc length of 513.06 feet, a central angle of 20°16'24", and a chord bearing and distance of N 89°51'48" E, 510.39 feet to a point for a corner;
9. S 80°00'00" E a distance of 1050.23 feet to a point for a corner;
10. S 03°53'04" E a distance of 218.72 feet to a point for a corner;
11. S 00°02'17" E a distance of 224.73 feet to a point for a corner;
12. S 22°13'23" W a distance of 402.48 feet to a point for a corner;
13. S 06°06'32" W a distance of 256.94 feet to a point for a corner;
14. S 33°54'08" W a distance of 311.60 feet to a point for a corner;
15. S 21°07'01" W a distance of 208.73 feet to a point for a corner;
16. S 20°46'40" W a distance of 77.68 feet to a point for a corner;
17. S 73°30'00" E a distance of 709.87 feet to a point for a corner;

18. Along a curve to the left having a radius of 1237.00 feet, an arc length of 120.55 feet, a central angle of 05°35'02", and a chord bearing and distance of S 76°17'31" E, 120.50 feet to a point for a corner;
19. N 53°47'30" E a distance of 41.32 feet to a point for a corner;
20. S 89°44'43" E a distance of 98.68 feet to a point for a corner;
21. S 39°35'41" E a distance of 68.75 feet to a point for a corner;
22. S 00°02'51" E a distance of 98.10 feet to a point for a corner;
23. Along a curve to the left having a radius of 1343.00 feet, an arc length of 82.43 feet, a central angle of 03°31'00", and a chord bearing and distance of S 89°16'07" E, 82.42 feet to a point for a corner;
24. N 88°58'23" E a distance of 728.11 feet to a point for a corner;
25. S 77°31'52" E a distance of 51.42 feet to a point for a corner;
26. N 88°58'23" E a distance of 250.55 feet to a point for a corner;
27. S 48°09'43" E a distance of 73.29 feet to a point for a corner;
28. Along a curve to the left having a radius of 1075.00 feet, an arc length of 732.04 feet, a central angle of 39°00'59", and a chord bearing and distance of S 26°07'58" E, 717.98 feet a point for a corner;
29. S 32°58'37" E a distance of 50.00 feet to a point for a corner;
30. S 47°37'38" E a distance of 66.22 feet to a point for a corner;
31. S 29°44'20" W a distance of 166.71 feet to a point for a corner;
32. S 53°40'25" W a distance of 209.97 feet to a point for a corner;
33. S 72°48'06" W a distance of 178.52 feet to a point for a corner;
34. S 29°00'49" W a distance of 222.76 feet to a point for a corner;
35. S 57°22'23" W a distance of 60.14 feet to a point for a corner;
36. Along a curve to the right having a radius of 1157.00 feet, an arc length of 76.82 feet, a central angle of 03°48'15", and a chord bearing and distance of S 60°45'52" W, 76.81 feet to a point for a corner;
37. S 62°40'00" W a distance of 165.41 feet to a point for a corner;
38. S 69°47'13" W a distance of 222.58 feet to a point for a corner;
39. S 45°36'15" W a distance of 239.27 feet to a point for a corner;
40. S 51°41'55" E a distance of 406.28 feet to a point for a corner;
41. Along a curve to the right having a radius of 863.00 feet, an arc length of 228.05 feet, a central angle of 15°08'26", and a chord bearing and distance of S 44°07'42" E, 227.39 feet to a point for a corner;
42. S 36°33'29" E a distance of 1008.91 feet to a point for a corner;
43. S 81°33'29" E a distance of 42.43 feet to a point in the Northwesterly right-of-way line of Loop 337, for a Southeasterly corner of the herein described tract;

THENCE along the Northwesterly right-of-way line of Loop 337, S 53°26'31" W a distance of 186.00 feet to a point for a corner;

THENCE continuing across said called 2086 acre tract, the following eight (8) calls:

1. N 08°26'31" E a distance of 42.43 feet to a point for a corner;
2. N 36°33'29" W a distance of 1008.91 feet to a point for a corner;
3. Along a curve to the left having a radius of 737.00 feet, an arc length of 194.75 feet, a central angle of 15°08'26", and a chord bearing and distance of N 44°07'42" W, 194.19 feet to a point for a corner;

4. N 51°41'55"W a distance of 345.82 feet to a point for a corner;
5. S 44°51'12" W a distance of 89.36 feet to a point for a corner;
6. S 54°38'59" W a distance of 442.34 feet to a point for a corner;
7. Along a curve to the left having a radius of 300.00 feet, an arc length of 160.48 feet, a central angle of 30°38'59", and a chord bearing and distance of S 39°19'29" W, 158.57 feet to a point for a corner;
8. S 24°00'00" W a distance of 762.50 feet to a point in the Southwesterly line of said called 2086 acre tract, common with the Northeasterly line of Oak Run Commercial Reserve Unit Eight, recorded in Document Number 200106003623, Map and Plat Records, Comal County, Texas, and a Southwest corner of the herein described tract;

THENCE along the Northeasterly line of said Oak Run Commercial Reserve Unit Eight, N 37°34'12" W a distance of 9.24 feet to a point for the North corner of said Oak Run Commercial Unit Eight and the East corner of Oak Run Commercial Unit Seven, recorded in Document Number 200206005209, Map and Plat Records, Comal County, Texas;

THENCE along the Northeasterly line of said Oak Run Commercial Unit Seven, N 37°34'47" W a distance of 369.59 feet to a point for the North corner of said Oak Run Commercial Unit Seven and the East corner of Oak Run Subdivision Unit 14, Recorded in Document Number 200606032712, Map and Plat Records, Comal County, Texas;

THENCE along the Northeasterly line of said Oak Run Subdivision Unit 14, N 37°36'44" W a distance of 1629.58 feet to a point for the North corner of said Oak Run Subdivision Unit 14, and the East corner of Oak Run Subdivision Unit Eleven, recorded in Document Number 9806024554, Map and Plat Records, Comal County, Texas;

THENCE along the Northeasterly line of said Oak Run Subdivision Unit Eleven, N 37°28'58" W a distance of 242.96 feet to a point for a corner;

THENCE continuing along the Northeasterly line of said Oak Run Subdivision Unit Eleven, and the Northeasterly line of Oak Run Subdivision Unit Ten, recorded in Document Number 9806013415, Map and Plat Records, Comal County, Texas, N 37°37'26" W a distance of 745.19 feet to a point for the North corner of said Oak Run Subdivision Unit Ten and the East corner of Oak Run Subdivision Unit Nine, recorded in Document Number 9806011099, Map and Plat Records, Comal County, Texas;

THENCE along the Northeast line of said Oak Run Subdivision Unit Nine, N 37°37'26" W a distance of 415.85 feet to a point for the North corner of said Oak Run Subdivision Unit Nine and the East corner of aforementioned Oak Run Subdivision Unit 21;

THENCE along the Northeasterly line of said Oak Run Subdivision Unit 21, the following four (4) calls:

1. N 37°38'22" W a distance of 459.79 feet to a point for a corner;
2. N 37°36'27" W a distance of 656.17 feet to a point for a corner;
3. N 37°21'34" W a distance of 315.93 feet to a point for a corner;
4. N 37°22'34" W a distance of 317.95 feet to the POINT OF BEGINNING and containing 275.212 acres of land, SAVE & EXCEPT 19.497 acres of land being all of a called 19.135

acre tract recorded in Document Number 201606012287, Official Public Records, Comal County, Texas and a 0.362 acre portion of a called 19.497 acre tract recorded in Document Number 201606009473, Official Public Records, Comal County, Texas, leaving a net acreage of 255.715 acres of land in Comal County, Texas.

Bearings, distances and areas shown herein are based upon the Veramendi Master Exhibit, dated July 26, 2016 as provided to HMT.

This description is based solely upon recorded deed(s) and a preliminary Master Plan. This does not reflect the results of an on-the-ground survey and is subject to change based upon actual fieldwork and/or changes to the Master Plan.

S:\Projects\216 - ASA Properties\001 - Brisbane 2A - 256.3acres – Veramendi
\101 - Boundary & Improvement\MB_255.715 AC_TN_9-13-16.docx

EXHIBIT B TO SPECIAL WARRANTY DEED WITH VENDOR'S LIEN

PERMITTED EXCEPTIONS

1. Easement granted to Comal County, by instrument dated June 26, 1970, recorded in Volume 179, Page 689 of the Official Public Records of Comal County, Texas.

2. Easement for highway purposes granted to the State of Texas, by instrument dated May 10, 1963, recorded in Volume 133, Page 464, of the Deed Records of Comal County, Texas.

3. The terms, conditions and stipulations of that certain Oil, Gas and Mineral Lease dated May 21, 1981, recorded in Volume 322, Page 254 of the Official Public Records of Comal County, Texas.

4. Sewer line agreement dated August 29, 1986, recorded in Volume 529, Page 566, of the Official Public Records of Comal County, Texas.

5. The terms, conditions and stipulations of that certain Lease Agreement to San Antonio Cellular Telephone Company, as Lessee, dated October 14, 1986, recorded in Volume 536, Page 78, of the Official Public Records of Comal County, Texas, and being further assigned to AT&T Technologies, Inc., by instrument recorded in Volume 537, Page 583, of the Official Public Records of Comal County, Texas.

6. Easement to New Braunfels Utilities for electric, water and sewer lines as set out in instrument recorded in Volume 746, Page 515, of the Official Public Records of Comal County, Texas.

7. Sewer line easement granted to the City of New Braunfels (Utilities), by instrument dated December 30, 1994, recorded in Volume 1018, Page 730, of the Official Public Records of Comal County, Texas.

8. Right of Use granted to Southwestern Bell Telephone Company, by instrument filed December 30, 1994, recorded in Instrument No. 9606018259, of the Official Public Records of Comal County, Texas.

9. Drainage Easement Agreement executed by and between Word-Borchers Ranch Real Estate Limited Partnership and Oakwood Baptist Church of New Braunfels, Texas, filed December 12, 2012, in Instrument No. 201206043815, of the Official Public Records of Comal County, Texas.

10. Strategic Partnership Agreement between the City of New Braunfels, Texas and the Comal County Water Improvement District No. 1, effective July 24, 2015, filed July 24, 2015, in Instrument No. 201506029553, Official Public Records of Comal County, Texas.

11. Development Agreement between City of New Braunfels and Word-Borchers Ranch Joint Venture for Proposed Mixed Use Development recorded July 24, 2015, in Instrument No. 201506029547, Official Public Records of Comal County, Texas. Said agreement modified by First Amendment recorded July 24, 2015, in Instrument No. 201506029548; Second Amendment recorded July 24, 2015, in Instrument No. 201506029549; Third Amendment recorded July 24, 2015, in Instrument No. 201506029550; Fourth Amendment recorded July 24, 2015, in Instrument No. 201506029551; Fifth Amendment recorded July 24, 2015, in Instrument No. 201506029552.

12. Utility Construct Cost Sharing Agreement for the Veramendi Development recorded July 24, 2015, in Instrument No. 201506029554, Official Public Records of Comal County, Texas.

13. NBU Electric Easement executed September 27, 2016, recorded October 7, 2016, in Instrument No. 201606038346, of the Official Public Records of Comal County, Texas

Filed and Recorded
Official Public Records
Bobbie Koepp, County Clerk
Comal County, Texas
03/14/2017 11:42:33 AM
CHRISTY 13 Page(s)
201706013192

Bobbie Koepp

Owner Authorization Form

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

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

Land Owner Authorization

I, Dean Word III of Word Borchers Ranch Real Estate Ltd. Partnership

Land Owner Name (Individual) | Firm (applicable to Legal Entities)

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

A- 3 SUR- 2 J M VERAMENDI, ACRES 407.1510, VERAMENDI PRECINCT 10B, BLOCK 35, LOT 4, A- 3 SUR- 2 J M VERAMENDI, ACRES 45.4500

(Legal description of the property referenced in the application)

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

Veramendi PE - Cairns, LLC

(Applicant Name / Plan Holder (Legal Entity or Individual))

to conduct:

Sewer line construction and associated grading

(Description of the proposed regulated activities)

on the property described above or at:

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

Land Owner Acknowledgement

I, Dean Word III of Word Borchers Ranch Real Estate Ltd. Partnership

Land Owner Name (Individual) | Firm (applicable to Legal Entities)

understand that while Veramendi PE - Cairns, LLC

Applicant Name / Plan Holder (Legal Entity or Individual)

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

I, Dean Word III of Word Borchers Ranch Real Estate Ltd. Partnership

Land Owner Name (Individual) Firm (applicable to Legal Entities)

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

I, Dean Word III of Word Borchers Ranch Real Estate Ltd. Partnership

Land Owner Name (Individual) Firm (applicable to Legal Entities)

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

Land Owner Signature

Land Owner Signature

8/12/2004

Date

THE STATE OF § TEXAS

County of § Comal

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

GIVEN under my hand and seal of office on this 12 day of August

NOTARY PUBLIC

VICKY GOLL
Notary Public, State of Texas
Comm. Expires 09/15/2024
Notary ID 13267870-7

Vicky Goll

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 09-15-2024

Attached: (Mark all that apply)

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

Applicant Acknowledgement

I, Garrett Mechler of Veramendi PE – Cairns, LLC

Applicant Name (Individual) | Firm (applicable to Legal Entities)

acknowledge that Word Borchers Ranch Real Estate Ltd. Partnership

Land Owner Name (Legal Entity or Individual)

has provided Veramendi PE – Cairns, LLC

Applicant Name (Legal Entity or Individual)

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

I understand that Veramendi PE – Cairns, LLC

Applicant Name (Legal Entity or Individual)

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

Applicant Signature

Applicant Signature

8/9/2024

Date

THE STATE OF § Texas

County of § Comal

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

GIVEN under my hand and seal of office on this 9 day of August, 2024

ALEX HARDEMAN
Notary Public, State of Texas
Comm. Expires 05-20-2028
Notary ID 130670969

Alex Hardeman

NOTARY PUBLIC

Alex Hardeman

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 5/20/2028

Word-Borchers Ranch

Notice of confidentiality rights: if you are a natural person, you may remove or strike any or all of the following information from this instrument before it is filed for record in the public records: your social security number or your driver's license number.

SPECIAL WARRANTY DEED

DATE: December 31, 2009

GRANTORS AND GRANTORS' MAILING ADDRESSES (Including County):

GRANTOR	ADDRESS
Timothy Dean Word, Jr., as trustee of the Bryan Carl Word Second Trust created by trust agreement dated December 30, 1968 between Dean Word and Eunice Word as grantors and Timothy Dean Word, Jr. and Suzanne Zachry Word as trustees for the benefit of Bryan Carl Word, (referred to herein as the **"Bryan Carl Word Second Trust"**.	401 Torcido Drive San Antonio, Bexar County, Texas 78209
Suzanne Zachry Word as trustee of the Bryan Carl Word Second Trust.	401 Torcido Drive San Antonio, Bexar County, Texas 78209
Bryan Carl Word, individually and as beneficiary of the Bryan Carl Word Second Trust.	311 Torcido Drive San Antonio, Bexar County, Texas 78209

GRANTEE: Bryan Carl Word Trust, created by merger of the Bryan Carl Word First Trust[1] and the Bryan Carl Word Second Trust. The merger of the Bryan Carl Word First Trust and the Bryan Carl Word Second Trust was consummated by document styled, **"Merger, Modification, and Restatement of Bryan Carl Word First Trust and Bryan Carl Word Second Trust hereinafter Known as Bryan Carl Word Trust"** dated February 25, 1995. The present trustee of the Bryan Carl Word Trust is Bryan Carl Word.

GRANTEE'S MAILING ADDRESS (Including County):

311 Torcido Drive
San Antonio, Bexar County, Texas 78209

CONSIDERATION: Ten and No/100 Dollars ($10.00) and other good and valuable consideration in hand paid, the receipt, sufficiency and fairness of which consideration is hereby acknowledged and confessed, and for the further consideration of the contribution by Grantor, Bryan Carl Word, to Grantee.

---

[1] The Bryan Carl Word First Trust was created by trust indenture dated December 31, 1965 by and between Dean Word and wife, Eunice Word as grantors and Timothy Dean Word, Jr. and wife, Suzanne Zachry Word as trustees.

PROPERTY (Including Any Improvements): ***An undivided one fourteenth (1/14) interest*** in and to that certain tract or parcel of land situated in Comal County, Texas, containing approximately 2,755.404 acres, more or less, and being more particularly described as being 2,780 acres, more or less, consisting of a 2,086 acre tract and a 694 acre tract, ***SAVE AND EXCEPT*** for 24.596 acres, more or less, consisting of a 24.2 acre tract and a 0.396 acre tract, to wit:

1. **2,780 ACRE TRACT:** 2,780 acres, more or less, being the aggregate of two subtracts containing 2,086 acres and 694 acres, (herein, the **"2,086 Acre Tract"** and the **"694 Acre Tract"**, respectively) such subtracts being more particularly described as follows:

   a. **2,086 ACRE TRACT:** 2,086 acres, more or less, described in and conveyed by deed dated December 5, 1941 from Harry Landa and Hannah Mansfield Landa as grantors, and Dean Word and wife Eunice Word as grantees, such deed having been recorded in *Volume 74, Pages 510-512* of the Deed Records of Comal County, Texas;

   b. **694 ACRE TRACT:** 694 acres, more or less, described in and conveyed by deed dated December 28, 1943 from C.H. Bruemmer and wife Ella Bruemmer as grantors, and Dean Word as grantee, such deed having been recorded in *Volume 78, Page 503* of the Deed Records of Comal County, Texas;

The 2086 Acre Tract and the 694 Acre Tract are the same tracts that were described in and conveyed by two deeds dated December 27, 1968 (the **"1968 Deeds of Gift"**), each of which conveyed an undivided one-half interest in the 2086 Acre Tract and the 694 Acre Tract, and each of which referred to the 2086 Acre Tract as the **"First Tract"** and to the 694 Acre Tract as the **"Fourth Tract"**. The December 27, 1968 Deeds of Gift were recorded in Volume 167, Pages 80-92 and in Volume 167, Pages 92-105, respectively, of the Deed Records of Comal County, Texas.

SAVE AND EXCEPT for 24.596 acres, more or less, consisting of a 24.2 acre tract and a 0.396 acre tract, described in Paragraphs 2 and 3 below:

2. **24.2 ACRE TRACT:** 24.2 acres, more or less, being the aggregate of four tracts or parcels of land that were described in and conveyed by the following deeds:

   a. Deed dated December 1, 1983, conveying approximately 3.4892 acres of land, more or less, described as Lot 1, Block 1, Oakwood Baptist Church Subdivision Unit One, from Timothy Dean Word, Jr., et. al. as grantors, to Oakwood Baptist Church of New Braunfels, Texas as grantee, such deed having been recorded in *Volume 362, Page 359* of the Deed Records of Comal County, Texas;

   b. Deed dated February 19, 1986, conveying 0.0413 acres of land, more or less, from Timothy Dean Word, Jr., et. al. as grantors, to Oakwood Baptist Church of New Braunfels, Texas as grantee, such deed having been recorded in *Volume 509, Page 472-475* of the Official Public Records of Real Property of Comal County, Texas;

c. Deed dated February 19, 1986, conveying 3.5805 acres of land, more or less, from Timothy Dean Word, Jr., et. al. as grantors, to Oakwood Baptist Church of New Braunfels, Texas as grantee, such deed having been recorded under *Document Number 9906004160*, also known as *Volume 509, Page 479-483* of the Official Public Records of Real Property of Comal County, Texas;

d. Deed dated May 14, 2007, conveying 17.089 acres of land, more or less, from B.M.B. Ranch Holdings, Ltd., a Texas limited partnership, et. al. as grantors, and Oakwood Baptist Church of New Braunfels, Texas as grantee, such deed having been recorded under *Document Number 200706020677* of the Official Public Records of Real Property of Comal County, Texas.

3. **0.396 ACRE TRACT:** 0.396 acres of land, more or less, together with a 20' easement, described in and conveyed by deed dated March 23, 1983 from William H. Borchers and wife, Joyce Word Borchers, individually, and as trustees for Mary Marcia Borchers and Georgia Bonner Borchers, and Timothy Dean Word, Jr. and wife, Suzanne Zachry Word, individually and as trustees for Timothy Dean Word, III, Forrest Roark Word, Patrick Zachry Word, Bryan Carl Word, and Mary Amber Word, such deed having been recorded in Volume 449, Page 77-79 of the Official Public Records of Real Property of Comal County, Texas.

RESERVATIONS FROM AND EXCEPTIONS TO CONVEYANCE AND WARRANTY:

This conveyance is made and accepted expressly subject to the following matters (collectively, the **"Reservations from and Exceptions to Conveyance and Warranty"**):

1. Any and all restrictions, reservations, covenants and easements, if any, relating to the hereinabove described Property, to the extent and only to the extent that same are still in force and effect and shown of record in the Office of the County Clerk of Comal County, Texas, together with all zoning laws, regulations and ordinances of municipal and/or other governmental authorities, if any, but only to the extent that they are still in effect and relate to the hereinabove described Property;

2. The following title exceptions:

PURPOSE	RECORDING REFERENCE	RECORDS
Easement for Highway Purposes	Volume 133, Page 464	Deed Records of Comal County
Electric, Water, Sewer Line Right of Way Agreement to City of New Braunfels	Volume 120, Page 548-549	Deed Records of Comal County, Texas
Sewer Line Agreement to the City of New Braunfels for utilities	Volume 129, Page 473-475	Deed Records of Comal County, Texas
Electric, Water, Sewer Line of Way Agreement to City of New Braunfels	Volume 134, Page 540	Deed Records of Comal County, Texas
Easement	Volume 179, Page 689	Official Public Records of Real Property of Comal County, Texas

PURPOSE	RECORDING REFERENCE	RECORDS
Electric Line Right of Way Agreement	1. Volume 343, Page 37; 2. Volume 451, Page 871	Official Public Records of Real Property of Comal County, Texas
Sewer Line Agreement	Volume 529, Page 566	Official Public Records of Real Property of Comal County, Texas
Site Lease Agreement	1. Volume 536, Page 78; 2. Volume 537, Page 583.	Official Public Records of Real Property of Comal County, Texas
Sewer Line Right of Way Agreement	Volume 1018, Page 730	Official Public Records of Real Property of Comal County, Texas
Easement to Southwestern Bell Telephone Company	Clerk's File Number 9606018259	Official Public Records of Real Property of Comal County, Texas

3. Taxes for 2009, not yet due and payable, the payment of which Grantee assumes;

Grantors, for the Consideration and subject to the Reservations From and Exceptions to Conveyance and Warranty, **GRANT, SELL,** and **CONVEY** to Grantee the Property, together with all and singular the rights and appurtenances thereto in anywise belonging, **TO HAVE AND TO HOLD** it to Grantee and Grantee's successors and assigns forever. Grantors hereby bind Grantors and Grantors' respective heirs, executors, personal representatives, successors and assigns to **WARRANT AND FOREVER DEFEND** all and singular the Property to Grantee and Grantee's successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof, except as to the Reservations From and Exceptions to Conveyance and Warranty, when the claim is made by, through, or under Grantors but not otherwise.

Wherever the context shall so require, all words herein in the male, female or neuter gender shall be deemed to include all other genders, all singular words shall include the plural, and all plural words shall include the singular.

GRANTORS:

BRYAN CARL WORD SECOND TRUST (created by trust agreement dated December 30, 1968 between Dean Word and Eunice Word as grantors and Timothy Dean Word, Jr. and Suzanne Zachry Word as trustees for the benefit of Bryan Carl Word)

Timothy Dean Word, Jr.

By: Timothy Dean Word, Jr., Trustee

By: Suzanne Zachry Word, Trustee

By: Bryan Carl Word, Beneficiary

Bryan Carl Word

THE STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was acknowledged before me on the 28th day of **July 2010**, by **Timothy Dean Word, Jr. as Trustee of the Bryan Carl Word Second Trust, created by trust agreement dated December 30, 1968 between Dean Word and Eunice Word as grantors and Timothy Dean Word, Jr. and Suzanne Zachry Word as trustees for the benefit of Bryan Carl Word.**

SANDRA KIESLING
Notary Public, State of Texas
My Commission Expires
November 17, 2010

Notary Public, State of Texas

THE STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was acknowledged before me on the 28th day of **July 2010**, by **Suzanne Zachry Word as Trustee of the Bryan Carl Word Second Trust, created by trust agreement dated December 30, 1968 between Dean Word and Eunice Word as grantors and Timothy Dean Word, Jr. and Suzanne Zachry Word as trustees for the benefit of Bryan Carl Word.**

SANDRA KIESLING
Notary Public, State of Texas
My Commission Expires
November 17, 2010

Notary Public, State of Texas

THE STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was acknowledged before me on the 28th day of **July 2010**, by **Bryan Carl Word, Individually and as Beneficiary of the Bryan Carl Word Second Trust, created by trust agreement dated December 30, 1968 between Dean Word and Eunice Word as grantors and Timothy Dean Word, Jr. and Suzanne Zachry Word as trustees for the benefit of Bryan Carl Word.**

SANDRA KIESLING
Notary Public, State of Texas
My Commission Expires
November 17, 2010

Sandra Kiesling
Notary Public, State of Texas

PREPARED BY	AFTER RECORDING RETURN TO
Law Offices of Peter M. Wolverton 601 Northwest Loop 410, Suite 104 San Antonio, Texas 78216 (210) 525-0825	Word-Borchers Ranch Real Estate Limited Partnership c/o Mr. William H. Borchers 251 South Seguin Avenue New Braunfels, Texas 78130

2009\REAL\DEED\WORD126.1231\00063569.DOC

Filed and Recorded
Official Public Records
Joy Streater, County Clerk
Comal County, Texas
07/29/2010 04:09:30 PM
CASHONE
201006024823

Joy Streater

Word-Borchers Ranch

Notice of confidentiality rights: if you are a natural person, you may remove or strike any or all of the following information from this instrument before it is filed for record in the public records: your social security number or your driver's license number.

SPECIAL WARRANTY DEED

DATE: December 31, 2009

GRANTORS AND GRANTORS' MAILING ADDRESSES (Including County):

GRANTOR	ADDRESS
Timothy Dean Word, Jr., as trustee of the Bryan Carl Word Second Trust created by trust agreement dated December 30, 1968 between Dean Word and Eunice Word as grantors and Timothy Dean Word, Jr. and Suzanne Zachry Word as trustees for the benefit of Bryan Carl Word, (referred to herein as the **"Bryan Carl Word Second Trust"**.	401 Torcido Drive San Antonio, Bexar County, Texas 78209
Suzanne Zachry Word as trustee of the Bryan Carl Word Second Trust.	401 Torcido Drive San Antonio, Bexar County, Texas 78209
Bryan Carl Word, individually and as beneficiary of the Bryan Carl Word Second Trust.	311 Torcido Drive San Antonio, Bexar County, Texas 78209

GRANTEE: Bryan Carl Word Trust, created by merger of the Bryan Carl Word First Trust[1] and the Bryan Carl Word Second Trust. The merger of the Bryan Carl Word First Trust and the Bryan Carl Word Second Trust was consummated by document styled, **"Merger, Modification, and Restatement of Bryan Carl Word First Trust and Bryan Carl Word Second Trust hereinafter Known as Bryan Carl Word Trust"** dated February 25, 1995. The present trustee of the Bryan Carl Word Trust is Bryan Carl Word.

GRANTEE'S MAILING ADDRESS (Including County):

311 Torcido Drive
San Antonio, Bexar County, Texas 78209

CONSIDERATION: Ten and No/100 Dollars ($10.00) and other good and valuable consideration in hand paid, the receipt, sufficiency and fairness of which consideration is hereby acknowledged and confessed, and for the further consideration of the contribution by Grantor, Bryan Carl Word, to Grantee.

---

[1] The Bryan Carl Word First Trust was created by trust indenture dated December 31, 1965 by and between Dean Word and wife, Eunice Word as grantors and Timothy Dean Word, Jr. and wife, Suzanne Zachry Word as trustees.

PROPERTY (Including Any Improvements): ***An undivided one fourteenth (1/14) interest*** in and to that certain tract or parcel of land situated in Comal County, Texas, containing approximately 2,755.404 acres, more or less, and being more particularly described as being 2,780 acres, more or less, consisting of a 2,086 acre tract and a 694 acre tract, ***SAVE AND EXCEPT*** for 24.596 acres, more or less, consisting of a 24.2 acre tract and a 0.396 acre tract, to wit:

1. **2,780 ACRE TRACT:** 2,780 acres, more or less, being the aggregate of two subtracts containing 2,086 acres and 694 acres, (herein, the **"2,086 Acre Tract"** and the **"694 Acre Tract"**, respectively) such subtracts being more particularly described as follows:

   a. **2,086 ACRE TRACT:** 2,086 acres, more or less, described in and conveyed by deed dated December 5, 1941 from Harry Landa and Hannah Mansfield Landa as grantors, and Dean Word and wife Eunice Word as grantees, such deed having been recorded in *Volume 74, Pages 510-512* of the Deed Records of Comal County, Texas;

   b. **694 ACRE TRACT:** 694 acres, more or less, described in and conveyed by deed dated December 28, 1943 from C.H. Bruemmer and wife Ella Bruemmer as grantors, and Dean Word as grantee, such deed having been recorded in *Volume 78, Page 503* of the Deed Records of Comal County, Texas;

The 2086 Acre Tract and the 694 Acre Tract are the same tracts that were described in and conveyed by two deeds dated December 27, 1968 (the **"1968 Deeds of Gift"**), each of which conveyed an undivided one-half interest in the 2086 Acre Tract and the 694 Acre Tract, and each of which referred to the 2086 Acre Tract as the **"First Tract"** and to the 694 Acre Tract as the **"Fourth Tract"**. The December 27, 1968 Deeds of Gift were recorded in Volume 167, Pages 80-92 and in Volume 167, Pages 92-105, respectively, of the Deed Records of Comal County, Texas.

SAVE AND EXCEPT for 24.596 acres, more or less, consisting of a 24.2 acre tract and a 0.396 acre tract, described in Paragraphs 2 and 3 below:

2. **24.2 ACRE TRACT:** 24.2 acres, more or less, being the aggregate of four tracts or parcels of land that were described in and conveyed by the following deeds:

   a. Deed dated December 1, 1983, conveying approximately 3.4892 acres of land, more or less, described as Lot 1, Block 1, Oakwood Baptist Church Subdivision Unit One, from Timothy Dean Word, Jr., et. al. as grantors, to Oakwood Baptist Church of New Braunfels, Texas as grantee, such deed having been recorded in *Volume 362, Page 359* of the Deed Records of Comal County, Texas;

   b. Deed dated February 19, 1986, conveying 0.0413 acres of land, more or less, from Timothy Dean Word, Jr., et. al. as grantors, to Oakwood Baptist Church of New Braunfels, Texas as grantee, such deed having been recorded in *Volume 509, Page 472-475* of the Official Public Records of Real Property of Comal County, Texas;

c. Deed dated February 19, 1986, conveying 3.5805 acres of land, more or less, from Timothy Dean Word, Jr., et. al. as grantors, to Oakwood Baptist Church of New Braunfels, Texas as grantee, such deed having been recorded under *Document Number 9906004160*, also known as *Volume 509, Page 479-483* of the Official Public Records of Real Property of Comal County, Texas;

d. Deed dated May 14, 2007, conveying 17.089 acres of land, more or less, from B.M.B. Ranch Holdings, Ltd., a Texas limited partnership, et. al. as grantors, and Oakwood Baptist Church of New Braunfels, Texas as grantee, such deed having been recorded under *Document Number 200706020677* of the Official Public Records of Real Property of Comal County, Texas.

3. **0.396 ACRE TRACT:** 0.396 acres of land, more or less, together with a 20' easement, described in and conveyed by deed dated March 23, 1983 from William H. Borchers and wife, Joyce Word Borchers, individually, and as trustees for Mary Marcia Borchers and Georgia Bonner Borchers, and Timothy Dean Word, Jr. and wife, Suzanne Zachry Word, individually and as trustees for Timothy Dean Word, III, Forrest Roark Word, Patrick Zachry Word, Bryan Carl Word, and Mary Amber Word, such deed having been recorded in Volume 449, Page 77-79 of the Official Public Records of Real Property of Comal County, Texas.

RESERVATIONS FROM AND EXCEPTIONS TO CONVEYANCE AND WARRANTY:

This conveyance is made and accepted expressly subject to the following matters (collectively, the **"Reservations from and Exceptions to Conveyance and Warranty"**):

1. Any and all restrictions, reservations, covenants and easements, if any, relating to the hereinabove described Property, to the extent and only to the extent that same are still in force and effect and shown of record in the Office of the County Clerk of Comal County, Texas, together with all zoning laws, regulations and ordinances of municipal and/or other governmental authorities, if any, but only to the extent that they are still in effect and relate to the hereinabove described Property;

2. The following title exceptions:

PURPOSE	RECORDING REFERENCE	RECORDS
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Electric, Water, Sewer Line Right of Way Agreement to City of New Braunfels	Volume 120, Page 548-549	Deed Records of Comal County, Texas
Sewer Line Agreement to the City of New Braunfels for utilities	Volume 129, Page 473-475	Deed Records of Comal County, Texas
Electric, Water, Sewer Line of Way Agreement to City of New Braunfels	Volume 134, Page 540	Deed Records of Comal County, Texas
Easement	Volume 179, Page 689	Official Public Records of Real Property of Comal County, Texas

PURPOSE	RECORDING REFERENCE	RECORDS
Electric Line Right of Way Agreement	1. Volume 343, Page 37; 2. Volume 451, Page 871	Official Public Records of Real Property of Comal County, Texas
Sewer Line Agreement	Volume 529, Page 566	Official Public Records of Real Property of Comal County, Texas
Site Lease Agreement	1. Volume 536, Page 78; 2. Volume 537, Page 583.	Official Public Records of Real Property of Comal County, Texas
Sewer Line Right of Way Agreement	Volume 1018, Page 730	Official Public Records of Real Property of Comal County, Texas
Easement to Southwestern Bell Telephone Company	Clerk's File Number 9606018259	Official Public Records of Real Property of Comal County, Texas

3. Taxes for 2009, not yet due and payable, the payment of which Grantee assumes;

Grantors, for the Consideration and subject to the Reservations From and Exceptions to Conveyance and Warranty, **GRANT, SELL,** and **CONVEY** to Grantee the Property, together with all and singular the rights and appurtenances thereto in anywise belonging, **TO HAVE AND TO HOLD** it to Grantee and Grantee's successors and assigns forever. Grantors hereby bind Grantors and Grantors' respective heirs, executors, personal representatives, successors and assigns to **WARRANT AND FOREVER DEFEND** all and singular the Property to Grantee and Grantee's successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof, except as to the Reservations From and Exceptions to Conveyance and Warranty, when the claim is made by, through, or under Grantors but not otherwise.

Wherever the context shall so require, all words herein in the male, female or neuter gender shall be deemed to include all other genders, all singular words shall include the plural, and all plural words shall include the singular.

GRANTORS:

BRYAN CARL WORD SECOND TRUST (created by trust agreement dated December 30, 1968 between Dean Word and Eunice Word as grantors and Timothy Dean Word, Jr. and Suzanne Zachry Word as trustees for the benefit of Bryan Carl Word)

Timothy Dean Word, Jr.

By: Timothy Dean Word, Jr., Trustee

By: Suzanne Zachry Word, Trustee

By: Bryan Carl Word, Beneficiary

Bryan Carl Word

THE STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was acknowledged before me on the 28th day of **July 2010**, by **Timothy Dean Word, Jr. as Trustee of the Bryan Carl Word Second Trust, created by trust agreement dated December 30, 1968 between Dean Word and Eunice Word as grantors and Timothy Dean Word, Jr. and Suzanne Zachry Word as trustees for the benefit of Bryan Carl Word.**

SANDRA KIESLING
Notary Public, State of Texas
My Commission Expires
November 17, 2010

Notary Public, State of Texas

THE STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was acknowledged before me on the 28th day of **July 2010**, by **Suzanne Zachry Word as Trustee of the Bryan Carl Word Second Trust, created by trust agreement dated December 30, 1968 between Dean Word and Eunice Word as grantors and Timothy Dean Word, Jr. and Suzanne Zachry Word as trustees for the benefit of Bryan Carl Word.**

SANDRA KIESLING
Notary Public, State of Texas
My Commission Expires
November 17, 2010

Notary Public, State of Texas

THE STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was acknowledged before me on the 28th day of **July 2010**, by **Bryan Carl Word, Individually and as Beneficiary of the Bryan Carl Word Second Trust, created by trust agreement dated December 30, 1968 between Dean Word and Eunice Word as grantors and Timothy Dean Word, Jr. and Suzanne Zachry Word as trustees for the benefit of Bryan Carl Word.**

SANDRA KIESLING
Notary Public, State of Texas
My Commission Expires
November 17, 2010

Sandra Kiesling
Notary Public, State of Texas

PREPARED BY	AFTER RECORDING RETURN TO
Law Offices of Peter M. Wolverton 601 Northwest Loop 410, Suite 104 San Antonio, Texas 78216 (210) 525-0825	Word-Borchers Ranch Real Estate Limited Partnership c/o Mr. William H. Borchers 251 South Seguin Avenue New Braunfels, Texas 78130

2009\REAL\DEED\WORD126.1231\00063569.DOC

Filed and Recorded
Official Public Records
Joy Streater, County Clerk
Comal County, Texas
07/29/2010 04:09:30 PM
CASHONE
201006024823

Joy Streater

Owner Authorization Form

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

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

Land Owner Authorization

I, Garrett Mechler of Veramendi PE – Darwin, LLC
Land Owner Name (Individual) Firm (applicable to Legal Entities)

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

A- 3 SUR- 2 J M VERAMENDI, ACRES 20.2100, A- 3 SUR- 2 J M VERAMENDI, ACRES 31.1000

(Legal description of the property referenced in the application)

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

Veramendi PE - Cairns, LLC

(Applicant Name / Plan Holder (Legal Entity or Individual))

to conduct:

Sewer line construction and associated grading

(Description of the proposed regulated activities)

on the property described above or at:

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

Land Owner Acknowledgement

I, Garrett Mechler of Veramendi PE – Darwin, LLC
Land Owner Name (Individual) Firm (applicable to Legal Entities)

understand that while Veramendi PE - Cairns, LLC
Applicant Name / Plan Holder (Legal Entity or Individual)

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

I, Garrett Mechler of Veramendi PE – Darwin, LLC

Land Owner Name (Individual) Firm (applicable to Legal Entities)

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

I, Garrett Mechler of Veramendi PE – Darwin, LLC

Land Owner Name (Individual) Firm (applicable to Legal Entities)

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

Land Owner Signature

Land Owner Signature

8/9/2024

Date

THE STATE OF § Texas

County of § Comal

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

GIVEN under my hand and seal of office on this 9 day of August, 2024

ALEX HARDEMAN
Notary Public, State of Texas
Comm. Expires 05-20-2028
Notary ID 130670969

NOTARY PUBLIC

Alex Hardeman

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 5/20/2028

Attached: (Mark all that apply)

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

Applicant Acknowledgement

I, Garrett Mechler of Veramendi PE – Cairns, LLC
Applicant Name (Individual) Firm (applicable to Legal Entities)

acknowledge that Veramendi PE – Darwin, LLC
Land Owner Name (Legal Entity or Individual)

has provided Veramendi PE – Cairns, LLC
Applicant Name (Legal Entity or Individual)

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

I understand that Veramendi PE – Cairns, LLC
Applicant Name (Legal Entity or Individual)

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

Applicant Signature

Applicant Signature

8/9/2024
Date

THE STATE OF § Texas

County of § Comal

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

GIVEN under my hand and seal of office on this 9 day of August, 2024

Alex Hardeman
NOTARY PUBLIC

ALEX HARDEMAN
Notary Public, State of Texas
Comm. Expires 05-20-2028
Notary ID 130670969

Alex Hardeman
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 5/20/2028

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

SPECIAL WARRANTY DEED WITH VENDOR'S LIEN

Effective Date: May 12, 2017

Grantor: WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP, a Texas limited partnership

Grantor's Mailing Address: Mr. Dean Word III
PO Box 310330
New Braunfels, Texas 78131

Grantee: Veramendi PE – Darwin, LLC, a Texas limited liability company

Grantee's Mailing Address: 387 W. Mill Street, Suite 108
New Braunfels, TX 78130

Consideration:

Ten and No/100 Dollars ($10.00) cash and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by Grantor, including without limitation that certain Amended and Restated Promissory Note (the "Note") of even date executed by Grantee and payable to the order of Grantor in the original principal amount of four million, four hundred seventy-two thousand, one hundred eighteen and 39/100 Dollars ($4,472,118.39), bearing interest at the rate therein provided, said Note containing the usual reasonable attorneys' fee clause and various acceleration of maturity clauses in case of default. The Note is secured by a Vendor's Lien and superior title retained in this Deed and by a Deed of Trust and Security Agreement (With Assignment of Rents) of even date from Grantee to Georgia B. Duettra, Trustee, which are, or shall be, secondary, subordinate and inferior only to the liens securing that certain promissory note in the original principal amount of up to Five Million Dollars ($5,000,000.00) (the "First Lien") which is, or shall be, payable to Security State Bank and Trust. The approximately 11.951 acre portion of Tract 2 (as defined below), which is more particularly described in **Exhibit C** (the "Unencumbered Land"), is expressly excluded from the Vender's Lien described above and is conveyed free and clear of the Vendor's Lien, Deed of Trust and First Lien.

Property (including any improvements):

Those certain tracts of land containing approximately 104 and .40 (104.40) acres ("Tract 1") and 81 and .86 (81.86) acres ("Tract 2") located in Comal County, Texas, that are more particularly described in **Exhibit A**.

Reservations from Conveyance:

SAVE AND EXCEPT, HOWEVER, and there is hereby RESERVED unto Grantor, its successors and assigns the following:

(a) all of the groundwater and groundwater rights together with all any appurtenant property rights, real or personal, hereditaments, licenses, and contracts, if any, related to or pertaining to the groundwater in and/or under the Property and all groundwater produced from any source or aquifer in and/or under that may be produced from the Property, together with any permits now or hereafter issued by any governmental entity with jurisdiction over the Property related to the Groundwater, including but not limited to the Comal Trinity Groundwater Conservation District and the Edwards Aquifer Authority (the "Groundwater") together with a reservation of the rights (i) of subsurface access to the Property for drilling, exploring, operating, developing, producing the Groundwater and/or drainage for the purpose of removing Groundwater from the Property, and (ii) of limited surface access and use in dedicated public rights of way and/or platted or recorded public utility easements for the limited purpose to construct, own, operate and maintain pipelines to transport water; provided, however, that Grantor (i) relinquishes and forever waives the right to access and use any portion of the surface of the Property to drill, explore, develop or produce the Groundwater, and (ii) grants to Grantee, and Grantee's successors, the limited right to drill exempt wells on the Property completed in and capable of producing groundwater only from the Edwards Aquifer (and not any other aquifer including the Trinity Aquifer) for Grantee's non-commercial personal domestic and livestock purposes, as the terms "exempt" and "domestic and livestock purposes" are defined in Chapter 36 of the Texas Water Code on the date of Closing, and provided further, that such grant to Grantee to drill for, produce and use the Groundwater from the Edwards Aquifer (a) is without warranty, guarantee or other representation as to the quantity or quality of the Groundwater that may be available or produced from the Property, and (b) is subject to any and all applicable statutes, regulations and rules, including those of the Edwards Aquifer Authority;

(b) all ranch improvements on or in the Property as of the Effective Date, including all houses, barns, sheds, fences, gates, windmills, water well equipment, including pipes and submergible pumps, and water distribution lines (the "Retained Improvements"), provided, however, that Grantor shall have a period of thirty (30) days following the Effective Date (the "Removal Period") to enter the Property and remove the Retained Improvements, it being understood that any Retained Improvements which are not removed from the Property by Grantor prior to the expiration of the Removal Period shall become the property of Grantee and Grantor shall have no further claim thereto.

Exceptions to Conveyance and Warranty:

The conveyance and warranties of title herein are expressly made subject to the

exceptions, easements, restrictive covenants, conditions and encumbrances set forth on **Exhibit B** attached hereto and incorporated herein for all purposes (the "Permitted Exceptions").

Grantor, for the Consideration and subject to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty, GRANTS, SELLS, and CONVEYS to Grantee the Property, together with all and singular the rights and appurtenances thereto in any way belonging, to have and to hold it to Grantee and Grantee's heirs, successors, and assigns forever. Grantor binds Grantor and Grantor's heirs and successors to warrant and forever defend all and singular the Property to Grantee and Grantee's heirs, successors, and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof when the claim is by, through, or under Grantor but not otherwise.

EXCEPT AS SET FORTH IN (A) THAT CERTAIN OPTION AGREEMENT DATED SEPTEMBER 14, 2015 BY AND BETWEEN VERAMENDI DEVELOPMENT COMPANY, LLC AND GRANTOR, AS LANDOWNER (THE "OPTION AGREEMENT"), AND (B) THIS SPECIAL WARRANTY DEED WITH VENDOR'S LIEN, THE PROPERTY IS CONVEYED AND TRANSFERRED TO GRANTEE "AS IS, WHERE IS AND WITH ALL FAULTS". GRANTOR DOES NOT WARRANT OR MAKE ANY REPRESENTATION, EXPRESS OR IMPLIED, AS TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, QUANTITY, QUALITY, PHYSICAL CONDITION OR ANY OTHER MATTER AFFECTING THE PROPERTY. INFORMATION PROVIDED OR TO BE PROVIDED BY GRANTOR IN RESPECT OF THE PROPERTY WAS OBTAINED FROM A VARIETY OF SOURCES. EXCEPT AS EXPRESSLY PROVIDED OTHERWISE HEREIN, GRANTOR HAS NOT MADE AN INDEPENDENT INVESTIGATION OF SUCH INFORMATION AND MAKES NO REPRESENTATIONS AS TO THE ACCURACY OR COMPLETENESS THEREOF. IN THIS REGARD, GRANTEE ACKNOWLEDGES THAT (A) GRANTEE DID NOT ENTER INTO THE OPTION AGREEMENT IN RELIANCE UPON ANY INFORMATION GIVEN TO GRANTEE PRIOR TO THE EFFECTIVE DATE THEREOF, INCLUDING, BUT NOT LIMITED TO, PROMOTIONAL MATERIALS OR FINANCIAL DATA, (B) GRANTEE MADE ITS DECISION TO PURCHASE THE PROPERTY BASED UPON GRANTEE'S OWN DUE DILIGENCE AND INVESTIGATIONS, (C) GRANTEE HAS SUFFICIENT KNOWLEDGE AND EXPERIENCE IN REAL ESTATE INVESTMENT TO EVALUATE THE MERITS AND RISKS OF THE TRANSACTIONS PROVIDED IN THE OPTION AGREEMENT, AND (D) GRANTEE IS FINANCIALLY ABLE TO BEAR THE ECONOMIC RISK OF THE LOSS OF SUCH INVESTMENT AND THE COST OF THE DUE DILIGENCE AND INVESTIGATIONS UNDER THE OPTION AGREEMENT. IT IS UNDERSTOOD AND AGREED THAT THE PURCHASE PRICE HAS BEEN ADJUSTED BY PRIOR NEGOTIATION TO REFLECT THAT THE PROPERTY IS BEING SOLD BY GRANTOR AND PURCHASED BY GRANTEE SUBJECT TO THE FOREGOING.

Taxes for the current year have been prorated and their payment is assumed by Grantee.

The use of any pronoun herein to refer to Grantor or Grantee shall be deemed a proper reference even though Grantor and/or Grantee may be an individual (either male or female), a corporation, a partnership or a group of two or more individuals, corporations and/or partnerships, and when this Deed is executed by or to a corporation, or trustee, the words "heirs,

executors and administrators" or "heirs and assigns" shall, with respect to such corporation or trustee, be construed to mean "successors and assigns".

The Vendor's Lien is retained in favor of the payee of the Note against the above-described property, premises and improvements, until the Note and all interest thereon shall have been fully paid according to the terms thereof, when this Deed shall become absolute.

Grantor acknowledges and agrees that (a) it previously filed Restrictive Covenants dated January 29, 2016 and recorded as Document No. 201606009472 of the real property records of Comal County, Texas (the "Restrictive Covenants"), (b) the Restrictive Covenants prohibit, on the Restricted Property (as that term is defined in the Restrictive Covenants) and for the benefit of the Benefited Property (as that term is defined in the Restrictive Covenants), uses that are noxious or which have a materially adverse effect on the Development (as that term is defined in that certain Company Agreement of Veramendi Development Company, LLC dated September 14, 2015), as described further in the Restrictive Covenants, (c) Veramendi PE – Darwin, LLC is an affiliate of Veramendi PE – Adelaide, LLC, as contemplated by Section 3 of the Restrictive Covenants, and (d) consequently for the purpose of the Restrictive Covenants, the above-described Property hereby is removed from the Restricted Property and now is included within the Benefited Property.

[SIGNATURES BEGIN ON NEXT PAGE]

EXECUTED to be EFFECTIVE as of the Effective Date.

GRANTOR:

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: _____
Amber Word-Heisner, Manager

By: _____
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

ACKNOWLEDGMENT

STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was sworn, subscribed, and acknowledged before me on May 11th, 2017 by Timothy Dean Word, III, Manager of Word-Borchers Ranch Management Company, L.L.C., as general partner of Word-Borchers Ranch Real Estate Limited Partnership, a Texas limited partnership, on behalf of said limited liability company and limited partnership.

_____
Notary Public, State of Texas

JENANE ROGERS
My Notary ID # 8055392
Expires February 3, 2019

Jenane Rogers
(Name - Typed or Printed)

2-3-2019
(My Commission Expires)

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: Amber Word Heisner
Amber Word-Heisner, Manager

By: _____
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF Los Angeles

On May 11, 2017, before me, Amber Word-Heisner, Manager of Word-Borchers Ranch Management Company, LLC, a Texas limited liability company, as general partner of Word-Borchers Ranch Real Estate Limited Partnership, on behalf of said limited liability company and limited partnership, personally appeared to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that she executed the same in her authorized capacity, and that by her signature on the instrument the entity upon behalf of which the person acted executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

A. LUSBY
Commission # 2082413
Notary Public - California
Los Angeles County
My Comm. Expires Oct 9, 2018

Notary Public in and for the State of California

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: _____
Amber Word-Heisner, Manager

By: Marcia Borchers McGlothlin
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

STATE OF TEXAS §
§
COUNTY OF COMAL §

This instrument was acknowledged before me on May 11th, 2017 by Marcia Borchers McGlothlin, Manager of Word-Borchers Ranch Management Company, L.L.C., as general partner of Word-Borchers Ranch Real Estate Limited Partnership, a Texas limited partnership, on behalf of said limited liability company and limited partnership.

Jenane Rogers
Notary Public, State of Texas

JENANE ROGERS
My Notary ID # 8055392
Expires February 3, 2019

Jenane Rogers
(Name - Typed or Printed)

2-3-2019
(My Commission Expires)

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP,
a Texas limited partnership

By: **Word-Borchers Ranch Management Company, LLC,** a Texas limited liability company, its General Partner

By: _____
Timothy Dean Word, III, Manager

By: _____
Amber Word-Heisner, Manager

By: _____
Marcia Borchers McGlothlin, Manager

By: _____
Georgia Borchers Duettra, Manager

STATE OF TEXAS §
§
COUNTY OF Tarrant §

This instrument was acknowledged before me on May 11, 2017 by Georgia Borchers Duettra, Manager of Word-Borchers Ranch Management Company, L.L.C., as general partner of Word-Borchers Ranch Real Estate Limited Partnership, a Texas limited partnership, on behalf of said limited liability company and limited partnership.

_____
Notary Public, State of Texas

CYNTHIA A. JERNIGAN
Notary Public
STATE OF TEXAS
ID#10882529
My Comm. Exp. June 12, 2017

_____
(Name - Typed or Printed)

6/12/2017
(My Commission Expires)

GRANTEE:

Veramendi PE – Darwin, LLC,
a Texas limited liability company

By: Veramendi Development Company, LLC,
a Texas limited liability company
Its: Manager

By: ASA Properties, LLC,
a Texas limited liability company
Its: Manager

By: _____
Peter James, President

STATE OF TEXAS §
§ **CORPORATE ACKNOWLEDGMENT**
COUNTY OF COMAL §

This instrument was acknowledged before me on this the 11 day of May 2017, by Peter James, a person known to me in his capacity as President of ASA Properties, LLC, the sole manager of Veramendi Development Company, LLC, the sole manager of Veramendi PE – Darwin, LLC, on behalf of Veramendi PE – Darwin, LLC.

_____
Notary Public, in and for the State of Texas
Exp 3/7/21

AFTER RECORDING RETURN TO:
Veramendi PE – Darwin, LLC
387 W. Mill Street, Suite 108
New Braunfels, Texas 78130
Attn: Peter James

MICHELLE HELEN MARTIN
NOTARY PUBLIC
ID# 13103796-5
State of Texas
Comm. Exp. 03-09-2021

EXHIBIT A
TO SPECIAL WARRANTY DEED

LEGAL DESCRIPTION OF PROPERTY

Tract 1 – 104.40 acres

Being a 104.40 acre tract of land out of the J.M. Veramendi Survey No. 2, Abstract No. 3, Comal County, Texas, being a portion of the remainder of a called 2086 acre tract described in Document Number 201006024825, Official Public Records, Comal County, Texas, said 104.40 acre tract of land being more particularly described as follows:

BEGINNING at a 1/2" iron pin (with cap stamped "HMT") set in the Northwesterly right-of-way line of Loop 337, from which a TXDOT disk monument found in the Northwesterly right-of-way of Loop 337 bears N 53°26'31"E a distance of 224.32 feet;

THENCE along the existing right-of-way line of said Loop 337, S 53°26'31" W a distance of 250.00 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner, from which a TXDOT disk monument found in the Northwesterly right-of-way of Loop 337 bears S 53°26'31"W a distance of 525.92 feet;

THENCE crossing said 2086 acre tract, the following fifty (50) calls:

1. N 08°26'31" E a distance of 70.71 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

2. N 36°33'29" W a distance of 739.47 feet to a 1/2" iron pin (with cap stamped "HMT") set at the beginning of a curve to the left;

3. Along said curve to the left having a radius of 1125.00 feet, a central angle of 011 °04'08", an arc length of 217.34 feet, a chord bearing and distance of N 42°05'34" W, 217.00 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

4. N 47°37'38"' W a distance of 161.87 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

5. N 51 °04'23" W a distance of 199.65 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

6. N 47°37'38"' W passing at a distance of 333.78 feet a 1/2" iron pin (with cap stamped "HMT") found for an Easterly corner of a proposed 255.72 acre tract, and continuing in all a total distance of 400.00 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

7. N 32°58'37" W a distance of 50.00 feet to a 1/2" iron pin (with cap stamped "HMT") found at the beginning of a curve to the right;

8. Along said curve to the right having a radius of 1075.00 feet, a central angle of 39°00'59", an arc length of 732.04 feet, and a chord bearing and distance of N 26°07'58" W, 717.98 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

9. N 48°09'43" W a distance of 73.29 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

10. S 88°58'23" W a distance of 250.55 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

11. N 77°31'52" W a distance of 51.42 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

12. S 88°58'23" W a distance of 728.11 feet to a 1/2" iron pin (with cap stamped "HMT") found at the beginning of a curve to the right;

13. Along said curve to the right having a radius of 1343.00 feet, a central angle of 03°31'00", an arc length of 82.43 feet, and a chord bearing and distance N 89°16'07" W, 82.42 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

14. N 00°02'51" W a distance of 98.10 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

15. N 39°35'41" W a distance of 68.75 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

16. N 89°44'43" W a distance of 98.68 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

17. S 53°47'30" W a distance of 41.32 feet to a 1/2" iron pin (with cap stamped "HMT") found at the beginning of a non-tangent curve to the right;

18. Along said non-tangent curve to the right having a radius of 1237.00 feet, a central angle of 05°35'02", an arc length of 120.55 feet, and a chord bearing and distance of N 76°17'31" W, 120.50 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

19. N 73°30'00" W a distance of 709.87 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

20. N 20°46'40" E a distance of 77.68 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

21. N 21°07'01"E a distance of 208.73 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

22. N 33°54'08" E a distance of 311.60 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

23. N 06°06'32" E a distance of 256.94 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

24. N 22°13'23" E a distance of 402.48 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

25. N 00°02'17" W a distance of 224.73 feet to a 1/2" iron pin (with cap stamped "HMT") found for corner;

26. N 03°53'04" W a distance of 218.72 feet to a 1/2" iron pin (with cap stamped "HMT") found for a Northeasterly corner of the proposed 255.72 acre tract, common with the Northwesterly corner of this herein described 104.40 acre tract;

27. S 80°00'00" E a distance of 320.32 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

28. S 66°30'15" E a distance of 51.42 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

29. S 80°00'00" E a distance of 400. 70 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

30. S 87°16'12" E a distance of 198.25 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

31. N 88°13'20" E a distance of 99.73 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

32. N 85°30'00" E a distance of 774.36 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

33. S 81 °00'15" E a distance of 51.42 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

34. N 85°30'00" E a distance of 250.00 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

35. S 49°30'00" E a distance of 70.71 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

36. N 84°44'10" E a distance of 150.01 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

37. S 04°30'00" E a distance of 331.74 feet to a 1/2" iron pin (with cap stamped "HMT") set at the beginning of

a curve to the right;

38. Along said curve to the right having a radius of 1075.00 feet, a central angle of 39°55'53", an arc length of 749.20 feet, and a chord bearing and distance of S 15°27'56" W, 734.13 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

39. S 35 °25'53" W a distance of 238.48 feet to a point for the beginning of a curve to the left;

40. Along said curve to the left having a radius of 913.00 feet, a central angle of 011 °23'33", an arc length of 181.54 feet, and a chord bearing and distance of S 29 °44'06" W, 181.24 feet to a 1/2" iron pin (with cap stamped "HMT") set at the beginning of a non-tangent curve to the left;

41. Along said non-tangent curve to the left having a radius of 977.86 feet, a central angle of 02 °55'48", an arc length of 50.01 feet, and a chord bearing and distance of S 36 °24'26" W, 50.00 feet to a 1/2" iron pin (with cap stamped NHMT") set at the beginning of a non-tangent curve to the left;

42. Along said non-tangent curve to the left having a radius of 925.00 feet, a central angle of 042 °37'21", an arc length of 688.11 feet, and a chord bearing and distance of S 00°17'57" E, 672.35 feet to a 1/2 11 iron pin (with cap stamped NHMT") set for corner;

43. S 35 °32'25" E a distance of 447.64 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

44. S 47 °37'38" E a distance of 369.80 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

45. S 51 °05'44" E a distance of 198.36 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

46. S 47 °37'38" E a distance of 172.49 feet to a 1/2" iron pin (with cap stamped NHMT") set for the beginning of a curve to the right;

47. Along said curve to the right having a radius of 1287.00 feet, a central angle of 10 °07'42", an arc length of 227.51 feet, and a chord bearing and distance of S 42 °33'47" E, 227.21 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

48. S 23 °18'03" E a distance of 51.57 feet to a 1/2" iron pin (with cap stamped "HMT') set for corner;

49. S 36 °33'29" E a distance of710.40 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

50. S 81 °33'29" E a distance of 70.71 feet to the POINT OF BEGINNING containing 104.40 acres in Comal County, Texas.

EXHIBIT A
TO SPECIAL WARRANTY DEED

LEGAL DESCRIPTION OF PROPERTY

Tract 2 – 81 acres

Being a 81.86 acre tract of land out of the J.M. Veramendi Survey No. 1, Abstract No. 2, Comal County, Texas, being a portion of the remainder of a called 2086 acre tract described in Document Number 201006024825, Official Public Records, Comal County, Texas, said 81.86 acre tract of land being more particularly described as follows:

BEGINNING at a 3/4" iron pin found for the West corner of Lot lR, Block 1, The Extension of Oakwood Baptist Church Subdivision, plat of which is recorded in Document No. 200806032437, Map and Plat Records, Comal County, Texas, and being a Southwesterly corner of herein described tract;

THENCE through said called 2086 acre tract the following thirty-three (33) calls:

1. N 35°44'24" W a distance of 253.64 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
2. S 63°09'06" W a distance of 348.33 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
3. N 26°50'54" W a distance of 227.47 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
4. N 41°00'00" Ea distance of 448.98 feet to a 1/2" iron pin (with cap stamped "HMT') set for corner;
5. N 63°00'00" Ea distance of 276.88 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
6. N 48°07'02" Ea distance of 302.03 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
7. N 17°10'28" Ea distance of 157.12 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
8. N 07°01'13" W a distance of 149.23 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
9. N 30°01'23" Ea distance of 119.30 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
10. N 13°27'35" Ea distance of 371.59 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
11. N 79°06'12" Ea distance of 263.28 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
12. S 05°07'35" W a distance of 289.38 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
13. S 48°49'35" Ea distance of 93.22 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
14. S 84°18'21" Ea distance of 135.99 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
15. S 57°07'51"' Ea distance of 91.15 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
16. N 41°43'37" Ea distance of 181.68 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
17. N 67°28'53" Ea distance of 600.20 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;
18. N 79°57'25" Ea distance of 595.53 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

19. S 79°24'42" Ea distance of 82.73 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

20. N 57°26'14" Ea distance of 114.85 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

21. S 57°07'53"' Ea distance of 163.17 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

22. S 34°32'41" Ea distance of 154.70 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

23. S 21°13'00" Ea distance of 194.24 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

24. S 26°32'29" Ea distance of 118.90 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

25. S 27°41'12" W a distance of 185.06 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

26. S 39°33'10" Ea distance of 114.61 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

27. S 02°48'46" W a distance of 188.59 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

28. S 18°55'17" W a distance of 261.01 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

29. S 13°41'46" Ea distance of 56.09 feet to a 1/2" iron pin (with cap stamped "HMT") set for the beginning of a non-tangent curve to the left;

30. Along said non-tangent curve to the left, having a radius of 6134.89 feet, a central angle of 07°48'06", an arc length of 835.35 feet and a chord bearing and distance of S 71 °28'06"W, 834.70 feet to a 1/2" iron pin (with cap stamped "HMT") set for a corner;

31. S 67°36'33" W a distance of 112.11 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

32. S 22°23'29" Ea distance of 380.00 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner;

33. S 67°23'29" Ea distance of 70.65 feet to a 1/2" iron pin (with cap stamped "HMT") set for a corner on the Northwesterly right-of-way line of said Loop 337, from which a TXDOT monument found bears, N 67°36'14" Ea distance of 60.37 feet;

THENCE along the Northwesterly right-of-way line of said Loop 337, S 67°36'14" W a distance of 454.44 feet to the Southeasterly
corner of the aforementioned Lot lR, from which a 1/2" iron pin (w/ cap "4233") found bears S 22°23'46" E, a distance of 0.71 feet;

THENCE along the boundary of the aforementioned Lot lR, the following eleven (11) calls:

1. Along the arc of a non-tangent curve to the left having a radius of 50.00 feet, a central angle of 89°29'52", an arc length of 78.10 feet, and a chord bearing and distance of N 22°53'35" E, 70.40 feet to a 1/2" iron pin (with cap stamped "CDS Muery") found for a corner;

2. N 22°36'10" W a distance of 149.61 feet to a 1/2" iron pin (with cap stamped "CDC Muery") found for corner;

3. N 32°46'46" W a distance of 61.99 feet to a 1/2" iron pin (with cap stamped "CDC Muery") found for corner;

4. N 22°37'29" W a distance of 43.27 feet to a 1/2" iron pin (with cap stamped "CDC Muery") found for corner;

5. Along the arc of a curve to the right having a radius of 618.00 feet, a central angle of 03°30'15", an arc

length of 37.80 feet, and a chord bearing and distance of N 20°50'59" W, 37.79 feet to a 1/2" iron pin (with cap stamped "CDC Muery") found for a corner;

6. N 06°23'12" W a distance of 65.66 feet to a 1/2" iron pin (with cap stamped "HMT") set for corner at the beginning of a curve to the right;

7. Along said curve to the right having a radius of 605.00 feet, a central angle of 10°21'31", an arc length of 109.38 feet, and a chord bearing and distance of N 07°48'03" W, 109.23 feet to a 1/2" iron pin (in concrete) found for a corner;

8. N 02°39'00" W a distance of 107.09 feet to a 1/2" iron pin (with cap stamped "CDC Muery") found for corner at the beginning of a curve to the left;

9. Along said curve to the left having a radius of 25.00 feet, a central angle of 90°12'06", an arc length of 39.38 feet, and a chord bearing and distance of N 47°58'31" W, 35.44 feet to a 1/2" iron pin (with cap stamped "HMT") set for a corner;

10. S 87°21'01" W a distance of 667.24 feet to a 1/2" iron pin (with cap stamped "CDC Muery") found for a corner at the beginning of a curve to the left;

11. Along said curve to the left having a radius of 926.14 feet, a central angle of 47°33'13", an arc length of 768.89 feet, and a chord bearing and distance of S 63°35'04" W, 747.01 feet to the POINT OF BEGINNING, containing 81.86 acres in Comal County, Texas.

SAVE AND EXCEPT for the 11.951 acres of Unencumber Land described in **Exhibit C**

EXHIBIT B
TO SPECIAL WARRANTY DEED WITH VENDOR'S LIEN

PERMITTED EXCEPTIONS

1. The terms, conditions and stipulations of that certain Oil, Gas and Mineral Lease dated May 21, 1981, recorded in Volume 322, Page 254 of the Official Public Records of Company County, Texas.

2. NBU Electric Easement recorded in Volume 451, Page 871, of the Official Public Records of Comal County, Texas.

3. Sewer line agreement dated August 29, 1986, recorded in Volume 529, Page 566, of the Official Public Records of Comal County, Texas.

4. Electric, water, sewer easement granted to the City of New Braunfels, recorded in Volume 746, Page 515, of the Official Public Records of Comal County, Texas.

5. A 25 foot building setback line and a 20 foot utility easement as set out in Instrument No. 200806032437, of the Official Public Records of Comal County, Texas.

6. Drainage Easement Agreement executed by and between Word-Borchers Ranch Real Estate Limited Partnership and Oakwood Baptist Church of New Braunfels, Texas, filed December 12, 2012, in Instrument No. 201206043815, of the Official Public Records of Comal County, Texas.

7. Strategic Partnership Agreement between the City of New Braunfels, Texas and the Comal County Water Improvement District No. 1, effective July 24, 2015, filed July 24, 2015, in Instrument No. 201506029553, Official Public Records of Comal County, Texas.

8. Development Agreement between City of New Braunfels and Word-Borchers Ranch Joint Venture for Proposed Mixed Use Development recorded July 24, 2015, in Instrument No. 201506029547, Official Public Records of Comal County, Texas. Said agreement modified by First Amendment recorded July 24, 2015, in Instrument No. 201506029548; Second Amendment recorded July 24, 2015, in Instrument No. 201506029549; Third Amendment recorded July 24, 2015, in Instrument No. 201506029550; Fourth Amendment recorded July 24, 2015, in Instrument No. 201506029551; Fifth Amendment recorded July 24, 2015, in Instrument No. 201506029552.

9. Utility Construct Cost Sharing Agreement for the Veramendi Development recorded July 24, 2015, in Instrument No. 201506029554 and amended in Instrument No. 201506029608, Official Public Records of Comal County, Texas.

EXHIBIT C
TO SPECIAL WARRANTY DEED WITH VENDOR'S LIEN

UNENCUMBERED LAND

METES AND BOUNDS DESCRIPTION FOR

11.951 ACRE PORTION OF TRACT 2

A 11.951 acre, or 520,603 square feet more or less, tract of land out of that 2086 acre tract described in deed to Word-Borchers Ranch Real Estates Limited Partnership recorded in Document No. 2010006024825 of the Official Public Records of Comal County, Texas, out of the Juan Martin De Veramendi Survey No. 2, Abstract 3, in Comal County, Texas. Said 11.951 acre tract being more fully described as follows, with bearings based on the Texas Coordinate System established for the South Central Zone from the North American Datum of 1983 NAD 83 (NA2011) epoch 2010.00;

BEGINNING: At a found *Yi"* iron rod with cap stamped "CDS/Muery" on the northwest right-of-way line of Loop 337, a variable width public right- of-way, the southeast corner of Lot 1 R, Block 1 of the Oakwood Baptist Church Subdivision recorded in Document No. 200806032437 of the Map and Plat Records of Comal County, Texas;

THENCE: Departing the northwest right-of-way of said Loop 337, along and with the east and north line of said Lot 1R the following bearings and distances:

Northeasterly, along a non-tangent curve to the left, said curve having a radial bearing of N 22°31'23" W, a radius of 50.00 feet, a central angle of 89°20'29", a chord bearing and distance of N 22°48'23" E, 70.30 feet, for an arc length of 77 .96 feet to a found *Yi"* iron rod with cap stamped "CDS/Muery";

N 22°36'10" W, a distance of 149.61 feet to a found 1/2" iron rod with cap stamped "CDS/Muery";

N 32°46'46" W, a distance of 61.99 feet to a found 1/2" iron rod with cap stamped "CDS/Muery";

N 22°37'29" W, a distance of 43.27 feet to a found 1/2" iron rod with cap stamped "CDS/Muery";

Northwesterly, along a non-tangent curve to the right, said curve having a radial bearing of N 67°23'54" E, a radius of 618.00 feet, a central angle of 03°30'15", a chord bearing and distance of N 20°50'59" W, 37.79 feet, for

an arc length of 37.80 feet to a found 1/2" iron rod with cap stamped "CDS/Muery";

N 06°23' 12" W, a distance of 65.66 feet to a set 1/2' iron rod with yellow cap stamped "Pape-Dawson";

Northwesterly, along a non-tangent curve to the right, said curve having a radial bearing of N 77°01'12" E, a radius of 605.00 feet, a central angle of 10°21'31", a chord bearing and distance of N 07°48'03" W, 109.23 feet, for an arc length of 109.38 feet to a found MAG nail;

N 02°39'00" W, a distance of 107.09 feet to a found 1/2' iron rod;

Northwesterly, along a non-tangent curve to the left, said curve having a radial bearing of S 87°07'32" W, a radius of 25.01 feet, a central angle of 90°12'06", a chord bearing and distance of N 47°58'31" W, 35.44 feet, for an arc length of 39.38 feet to a set *W'* iron rod with yellow cap stamped "Pape-Dawson";

S 87°21'01" W, a distance of 667.24 feet to a found 1/2' iron rod with cap stamped "CDS";

Southwesterly, along a non-tangent curve to the left, said curve having a radial bearing of S 02°38' 19" E, a radius of 926.41 feet, a central angle of 47°34'10", a chord bearing and distance of S 63°34'36" W, 747.25 feet, for an arc length of 769.15 feet to a found 5/8" iron rod on for the northwest corner of said Lot 1R;

THENCE:

Departing the northwest corner of said Lot 1R, over and across said 2086 acre tract the following bearings and distances:

N 35°41'0 l " W, a distance of 253.70 feet to a set 1/2" iron rod with yellow cap stamped "Pape-Dawson;

N 63°09'06" E, a distance of 33.82 feet to a set *1/2"* iron rod with yellow cap stamped "Pape-Dawson";

Northeasterly, along a tangent curve to the left, said curve having a radius of 643.00 feet, a central angle of 39°25'06", a chord bearing and distance of N 43°26'33" E, 433.70 feet, for an arc length of 442.37 feet to a set *Vi"* iron rod with yellow cap stamped "Pape-Dawson";

N 23°44'00" E, a distance of 4.27 feet to a set *Vi"* iron rod with yellow cap stamped "Pape-Dawson";

N 65°44'05" E, a distance of 74.31 feet to a set *Yi"* iron rod with yellow

cap stamped "Pape-Dawson";

Southeasterly, along a non-tangent curve to the left, said curve having a radial bearing of N 15°31'54" E, a radius of 650.00 feet, a central angle of 18°11'54", a chord bearing and distance of S 83°34'03" E, 205.59 feet, for an arc length of 206.45 feet to a set *1/2"* iron rod with yellow cap stamped "Pape-Dawson";

N 87°20'00" E, a distance of 615.47 feet to a set *1/2"* iron rod with yellow cap stamped "Pape-Dawson";

Southeasterly, along a tangent curve to the right, said curve having a radius of 550.00 feet, a central angle of 70°16'30", a chord bearing and distance of S 57°31'45" E, 633.10 feet, for an arc length of 674.59 feet to a set *Yi"* iron rod with yellow cap stamped "Pape-Dawson";

S 22°23'29" E, a distance of 373.50 feet to a set 1/2" iron rod with yellow cap stamped "Pape-Dawson";

S 22°36'3 l" W, a distance of 70.71 feet to a set *1/2"* iron rod with yellow cap stamped "Pape-Dawson" on the northwest right-of-way of said Loop 337;

THENCE:

S 67°36'31" W, along and with the northwest right-of-way line of said Loop 337, a distance of 254.34 feet to the POINT OF BEGINNING, and containing 11.951 acres in Comal County, Texas. Said tract being described in accordance with an exhibit prepared under job number 7620-39 by Pape-Dawson Engineers, Inc.

S 67°36'31" W, along and with the northwest right-of-way line of said Loop 337, a distance of 254.34 feet to the POINT OF BEGINNING, and containing 11.951 acres in Comal County, Texas. Said tract being described in accordance with an exhibit prepared under job number 7620-39 by Pape-Dawson Engineers, Inc.

Filed and Recorded
Official Public Records
Bobbie Koepp, County Clerk
Comal County, Texas
05/15/2017 01:46:05 PM
MEDINM 19 Pages(s)
201706024862

County Court of Comal County, Texas

Bobbie Koepp

APPLICATION FEE FORM (TCEQ-0574)

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Veramendi S8-S10

Regulated Entity Location: Approximately 0.3 miles NW of the intersection of Borchers Blvd and Loop 337.

Name of Customer: Veramendi PE - Cairns, LLC

Contact Person: Garrett Mechler Phone: (830) 643-1338

Customer Reference Number (if issued):CN _____

Regulated Entity Reference Number (if issued):RN _____

Austin Regional Office (3373)

☐ Hays ☐ Travis ☐ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde

☒ Comal ☐ Kinney

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

☐ Austin Regional Office

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

☐ San Antonio Regional Office

☒ Overnight Delivery to: TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	***Size***	***Fee Due***
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	$
Sewage Collection System	4668.29 L.F.	$ 2334.15
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature: _____ Date: 5/7/2024

Application Fee Schedule

Texas Commission on Environmental Quality

Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

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

Organized Sewage Collection Systems and Modifications

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

Underground and Aboveground Storage Tank System Facility Plans and Modifications

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

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	***Fee***
Extension of Time Request	$150

CORE DATA FORM
(TCEQ-10400)

TCEQ Use Only

TCEQ Core Data Form

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

SECTION I: General Information

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

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

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

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

SECTION II: Customer Information

4. General Customer Information	5. Effective Date for Customer Information Updates (mm/dd/yyyy)	

☒ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ 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: eg: Doe, John*)	*If new Customer, enter previous Customer below:*
Veramendi PE - Cairns, 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*)
0802990846	32066872188	30-1085059	

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☐ Limited
Government: ☐ City ☐ County ☐ Federal ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

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

13. Independently Owned and Operated?
☐ **Yes** ☐ **No**

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

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

15. Mailing Address:	2168 Oak Run Parkway, Suite 101						
	City	New Braunfels	**State**	TX	**ZIP**	78132	**ZIP + 4**

16. Country Mailing Information (*if outside USA*)	17. E-Mail Address (*if applicable*)
	garrett.mechler@asaproperties.us.com

18. Telephone Number	19. Extension or Code	20. Fax Number (*if applicable*)
( ) -		( ) -

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*)

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ 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 S8-S10

23. Street Address of the Regulated Entity: *(No PO Boxes)*								
	City		**State**		**ZIP**		**ZIP + 4**	
24. County								

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	Approximately 0.3 miles NW of the intersection of Borchers Blvd and Loop 337

26. Nearest City	**State**	**Nearest ZIP Code**
New Braunfels	TX	78130

27. Latitude (N) In Decimal:	29.723261	**28. Longitude (W) In Decimal:**	-98.154372

Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	43	23.74	98	9	15.74

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.)*

Sewage collection system for commercial development

34. Mailing Address:	**2168 Oak Run Pkwy, Suite 101**							
	City	**New Braunfels**	**State**	**TX**	**ZIP**	**78132**	**ZIP + 4**	

35. E-Mail Address:	**garrett.mechler@asaproperties.us.com**

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(830) 643-1338		( ) -

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.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

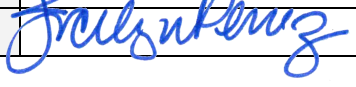
SECTION IV: Preparer Information

40. Name:	Chris Kowalski, P.E.	**41. Title:**	Senior Project Manager

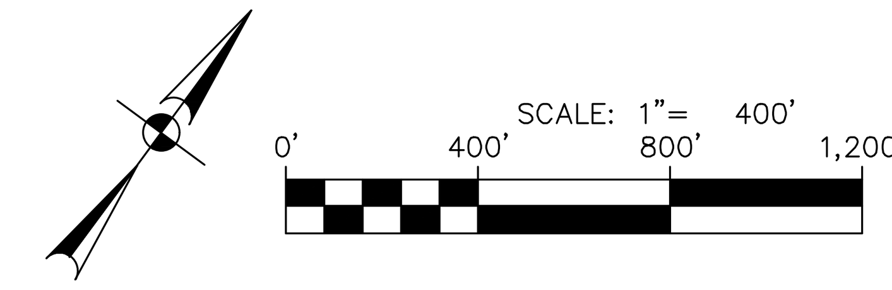
42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(830) 632-5633		( ) -	ckowalski@pape-dawson.com

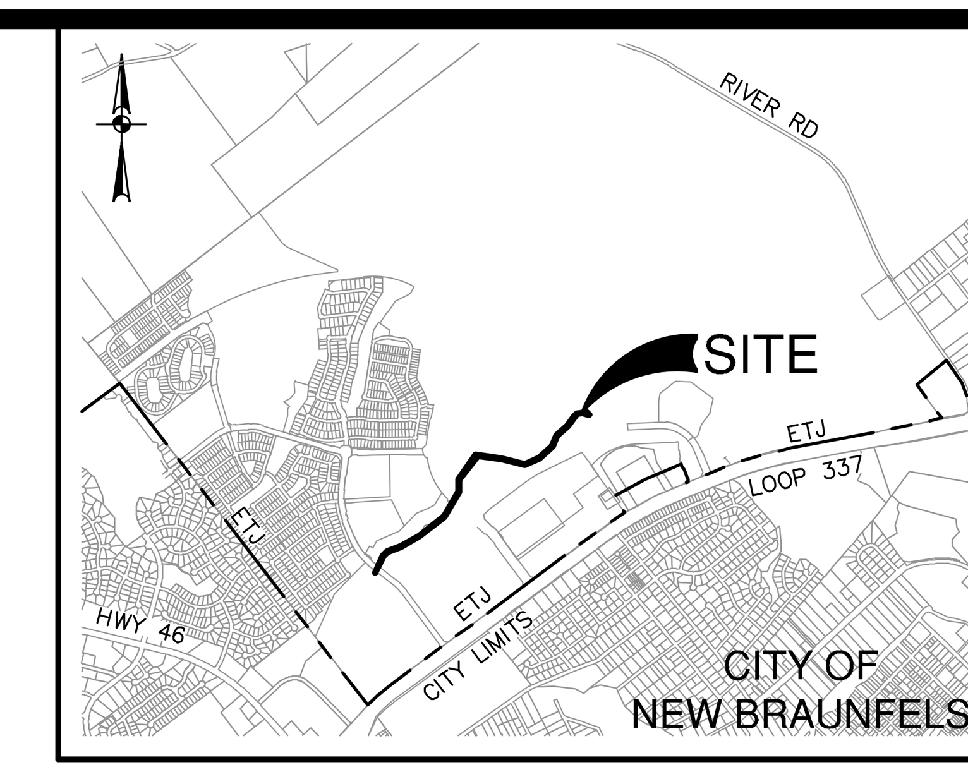
SECTION V: Authorized Signature

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 Consulting Engineers, LLC	**Job Title:**	Vice President	
Name *(In Print):*	Jocelyn Perez, P.E.		**Phone:**	(830) 632- **5633**
Signature:			**Date:**	6/26/2024

EXHIBITS



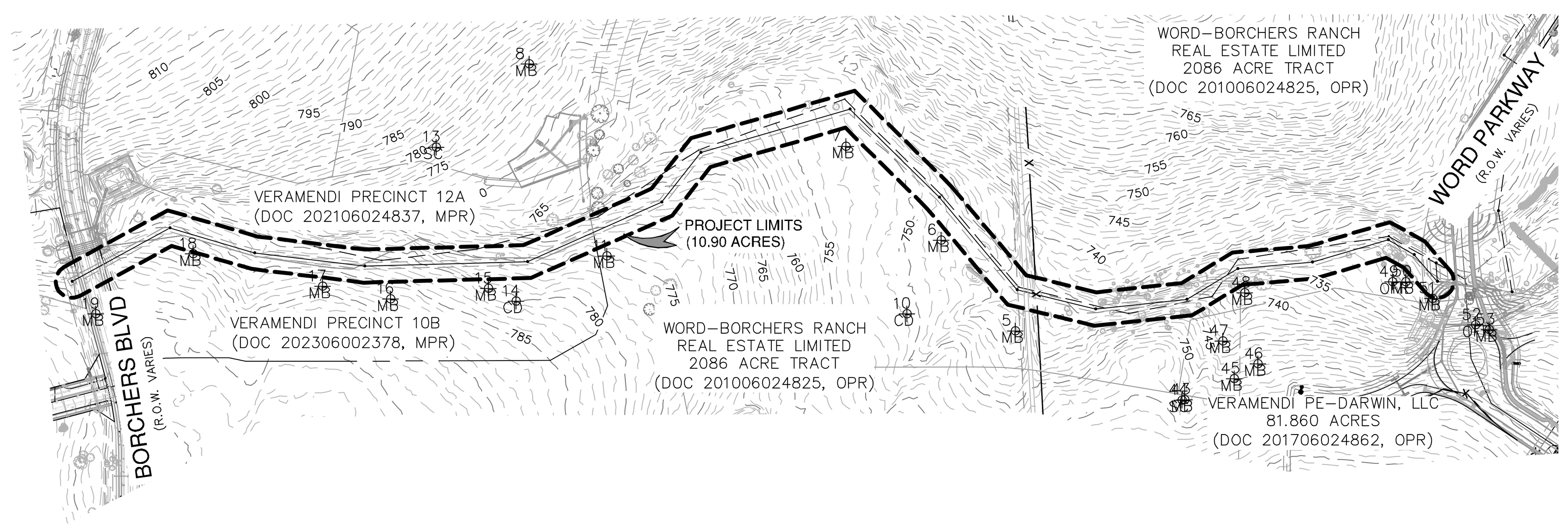


LOCATION MAP

NOT-TO-SCALE

LEGEND

	PROJECT LIMITS
976	EXISTING GRADE
970	PROPOSED GRADE
	FEMA 1% ANNUAL-CHANCE FLOODPLAIN
	EDWARDS AQUIFER RECHARGE ZONE
	FAULT, INFERRED
51 MB	POTENTIAL RECHARGE FEATURE
MB	MANMADE FEATURES IN BEDROCK
CD	NON-KARST CLOSED DEPRESSIONS
SC	SOLUTION CAVITY



6-14-2024

STATE OF TEXAS
JOCELYN PEREZ
98367
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS

1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

VERAMENDI S8-S10
NEW BRAUNFELS, TEXAS
SITE PLAN

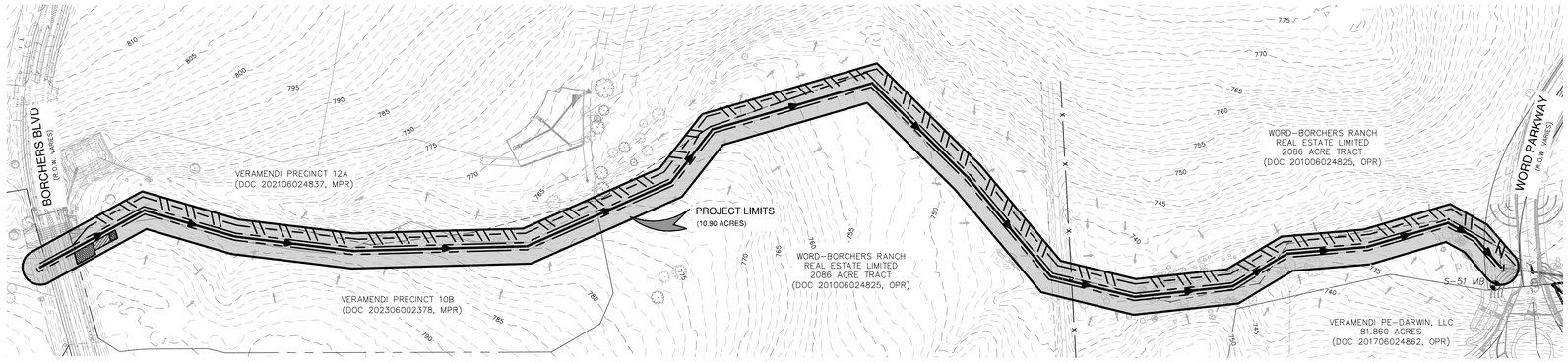
PLAT NO. ____
JOB NO. 30001-80
DATE JUNE 2024
DESIGNER CK
CHECKED ____ DRAWN MG
SHEET 1 OF 1

Date: June 14, 2024, 7:49 AM - User ID: cpresley
File: P:\300\01\80\Design\Environmental\YPAP-SITE-30001-80.dwg

TCEQ WATER POLLUTION ABATEMENT PLAN GENERAL CONSTRUCTION NOTES

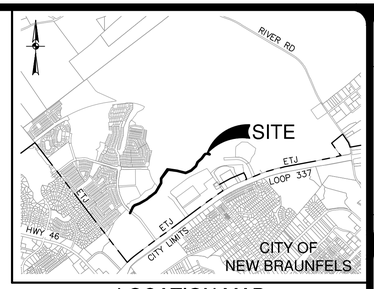
1. A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION OF ANY REGULATED ACTIVITIES. THIS NOTICE MUST INCLUDE:
   - THE NAME OF THE APPROVED PROJECT;
   - THE ACTIVITY START DATE; AND
   - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.
2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN (WPAP) AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS ARE REQUIRED TO KEEP ON-SITE COPIES OF THE APPROVED PLAN AND APPROVAL LETTER.
3. IF ANY SENSITIVE FEATURE(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.
4. 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.
5. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE 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 THE SITE SITUATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
6. 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.
7. SEDIMENT MUST BE REMOVED FROM THE SEDIMENT TRAPS OR SEDIMENT BASINS NOT LATER THAN WHEN IT OCCUPIES 50% OF THE BASIN'S DESIGN CAPACITY.
8. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER SHALL BE PREVENTED FROM BEING DISCHARGED OFFSITE. .CHROME
9. ALL SPOILS (EXCAVATED MATERIAL) GENERATED FORM THE PROJECT SITE MUST BE STORED ON-SITE WITH PROPER E&S CONTROLS. FOR STORAGE OR DISPOSAL OF SPOILS AT ANOTHER SITE ON THE EDWARDS AQUIFER RECHARGE ZONE, THE OWNER OF THE SITE MUST RECEIVE APPROVAL OF A WATER POLLUTION ABATEMENT PLAN FOR THE PLACEMENT OF FILL MATERIAL OR MASS GRADING PRIOR TO THE PLACEMENT OF SPOILS AT THE OTHER SITE.
10. 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.
11. THE FOLLOWING RECORDS SHALL BE MAINTAINED AND MADE AVAILABLE TO THE TCEQ UPON REQUEST:
   - THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR;
   - THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE; AND
   - THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.
12. THE HOLDER OF ANY APPROVED EDWARD QUIFER 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



TEMPORARY BMP MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION



LOCATION MAP

NOT-TO-SCALE

SCALE: 1"= 200'
0' 200' 400' 600'

SWPPP LEGEND

- PROJECT LIMITS
- EXISTING CONTOUR (976)
- PROPOSED CONTOUR (970)
- FLOW ARROW (EXISTING)
- FLOW ARROW (PROPOSED)
- SILT FENCE
- ROCK BERM
- GRAVEL FILTER BAGS
- GRATE INLET PROTECTION
- 50' SEWER BUFFER
- LIMITS OF DISTURBED AREA
- STABILIZED CONSTRUCTION ENTRANCE/EXIT (FIELD LOCATE)
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA (FIELD LOCATE)
- CONCRETE TRUCK WASH-OUT PIT (FIELD LOCATE)
- POTENTIAL RECHARGE FEATURE (S-#)
- EXISTING TREE

GENERAL NOTES

1. DO NOT DISTURB VEGETATED AREAS (TREES, GRASS, WEEDS, BRUSH, ETC.) ANY MORE THAN NECESSARY FOR CONSTRUCTION.
2. CONSTRUCTION ENTRANCE/EXIT LOCATION, CONCRETE WASH-OUT PIT, AND CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE YARD TO BE DETERMINED IN THE FIELD.
3. 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.
4. RESTRICT ENTRY/EXIT TO THE PROJECT SITE TO DESIGNATED LOCATIONS BY USE OF ADEQUATE FENCING, IF NECESSARY.
5. ALL STORM WATER POLLUTION PREVENTION CONTROLS ARE TO BE MAINTAINED AND IN WORKING CONDITIONS AT ALL TIMES.
6. FOR A COMPLETE LISTING OF TEMPORARY STORM WATER POLLUTION PREVENTION CONTROLS REFER TO THE TPDES STORM WATER POLLUTION PREVENTION PLAN.
7. STORM WATER POLLUTION PREVENTION STRUCTURES SHOULD BE CONSTRUCTED WITHIN THE SITE BOUNDARIES. SOME OF THESE FEATURES MAY BE SHOWN OUTSIDE THE SITE BOUNDARIES ON THIS PLAN FOR VISUAL CLARITY.
8. 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.
9. BEST MANAGEMENT PRACTICES MAY BE INSTALLED IN STAGES TO COINCIDE WITH THE DISTURBANCE OF UPGRADIENT AREAS.
10. BEST MANAGEMENT PRACTICES MAY BE REMOVED IN STAGES ONCE THE WATERSHED FOR THAT PORTION CONTROLLED BY THE BEST MANAGEMENT PRACTICES HAS BEEN STABILIZED IN ACCORDANCE WITH TPDES REQUIREMENTS.
11. UPON COMPLETION OF THE PROJECT, INCLUDING SITE STABILIZATION, AND BEFORE FINAL PAYMENT IS ISSUED, CONTRACTOR SHALL REMOVE ALL SEDIMENT AND EROSION CONTROL MEASURES, PAYING SPECIAL ATTENTION TO ROCK BERMS IN DRAINAGE FEATURES.
12. WHERE VEGETATED FILTER STRIPS ARE INDICATED, CONTRACTOR SHALL VERIFY THAT SUFFICIENT VEGETATION EXISTS, OTHERWISE CONTRACTOR SHALL PLACE SILT FENCING IN LIEU OF VEGETATED FILTER STRIP.
13. SHADED AREA [ ] DENOTES LIMITS OF DISTURBED AREAS. OTHER AREAS WITHIN THE PROJECT LIMITS, WITH THE EXCEPTION OF A CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE YARD, ARE NOT A PART OF THIS TPDES STORM WATER POLLUTION PREVENTION PLAN (SWP3) AND WILL NOT BE DISTURBED BY CIVIL CONSTRUCTION ACTIVITIES.
14. PRIOR TO BEGINNING CONSTRUCTION, CONTRACTOR SHALL COORDINATE PLACEMENT OF TEMPORARY BEST MANAGEMENT PRACTICES WITHIN TXDOT RIGHT-OF-WAY WITH TXDOT.
15. NBU WILL FUNCTION AS A SECONDARY OPERATOR ON THIS PROJECT AND WILL BE INSTALLING ELECTRIC UTILITIES FOR ON-SITE CONSTRUCTION AND OFF-SITE FEED TO THE PROJECT.
16. PER TPDES REQUIREMENTS, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES WITHIN 21 DAYS. SEEDING DOES NOT CONSTITUTE AS STABILIZATION.

THE ENGINEERING SEAL HAS BEEN AFFIXED TO THIS SHEET ONLY FOR THE PURPOSE OF DEMONSTRATING COMPLIANCE WITH THE WATER POLLUTION ABATEMENT PLANS (WPAP) REGULATIONS.

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

EXHIBIT 1

NO.	REVISION	DATE

STATE OF TEXAS
JOCELYN PEREZ
98367
LICENSED
PROFESSIONAL ENGINEER
6-27-2024

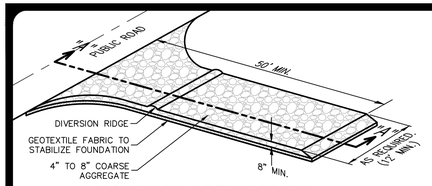
PAPE-DAWSON ENGINEERS
TEXAS ENGINEERING FIRM 470 | TEXAS SURVEYING FIRM #100288000
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633

VERAMENDI S8-S10
NEW BRAUNFELS, TEXAS

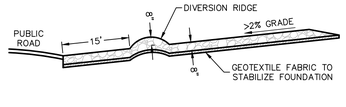
SEWAGE COLLECTION SYSTEM PLAN
TEMPORARY POLLUTION ABATEMENT PLAN

PLAT NO.
JOB NO. 30001-80
DATE JUNE 2024
DESIGNER CK
CHECKED DRAWN MG
SHEET 1 OF 1

Date: June 27, 2024, 7:17 AM - User ID: ckowalski
File: P:\300\01\80\Design\Environmental\TM-30001-80-WPAP.dwg



SCHEMATIC OF TEMPORARY CONSTRUCTION ENTRANCE/EXIT



SECTION "A-A" OF A 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.

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
1. THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

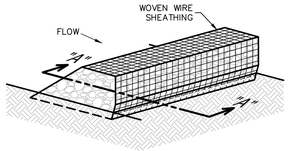
2. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.

3. WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY.

4. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

5. ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE BY USING APPROVED METHODS.

STABILIZED CONSTRUCTION ENTRANCE/EXIT DETAIL
NOT–TO–SCALE



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 LEFT 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 TIE WIRE SO THAT THE ENDS OF THE SHEATHING OVERLAP AT LEAST 2 INCHES, AND THE BERM RETAINS ITS SHAPE WHEN WALKED UPON.

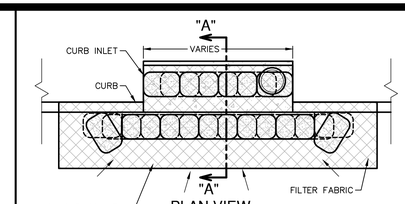
5. BERM SHOULD BE BUILT ALONG THE CONTOUR AT ZERO PERCENT GRADE OR AS NEAR AS POSSIBLE.

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



PLAN VIEW

SECTION "A-A"

GENERAL NOTES
1. CONTRACTOR TO INSTALL 2"x4"–W1.4xW1.4 WIRE MESH SUPPORTING FILTER FABRIC OVER THE INLET OPENING. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR WIRE TIES AT THIS LOCATION. SAND BAGS FILLED WITH WASHED PEA GRAVEL SHOULD BE PLACED ON TOP OF WIRE MESH ON TOP OF THE INLET AS SHOWN ON THIS DETAIL TO HOLD WIRE MESH IN PLACE. SANDBAGS FILLED WITH WASHED PEA GRAVEL SHOULD ALSO BE PLACED ALONG THE GUTTER AS SHOWN ON THIS DETAIL TO HOLD WIRE MESH IN PLACE. SAND BAGS TO BE STACKED TO FORM A CONTINUOUS BARRIER AROUND INLETS.

2. THE BAGS SHOULD BE TIGHTLY ABUTTED AGAINST EACH OTHER TO PREVENT RUNOFF FROM FLOWING BETWEEN THE BAGS.

INSPECTION AND MAINTENANCE GUIDELINES
1. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.

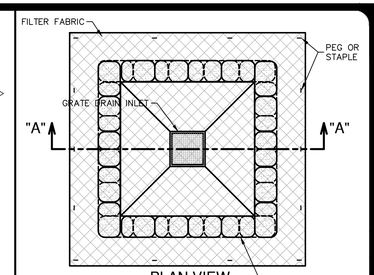
2. REMOVE SEDIMENT WHEN BUILDUP REACHES A DEPTH OF 3 INCHES. REMOVED SEDIMENT SHOULD BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.

3. CHECK PLACEMENT OF DEVICE TO PREVENT GAPS BETWEEN DEVICE AND CURB.

4. INSPECT FILTER FABRIC AND PATCH OR REPLACE IF TORN OR MISSING.

5. STRUCTURES SHOULD BE REMOVED AND THE AREA STABILIZED ONLY AFTER THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

BAGGED GRAVEL CURB INLET PROTECTION DETAIL
NOT–TO–SCALE



PLAN VIEW

SECTION "A-A"

GENERAL NOTES
1. THE SANDBAGS SHOULD BE FILLED WITH WASHED PEA GRAVEL AND STACKED TO FORM A CONTINUOUS BARRIER ABOUT 1 FOOT HIGH AROUND INLETS.

2. THE BAGS SHOULD BE TIGHTLY ABUTTED AGAINST EACH OTHER TO PREVENT RUNOFF FROM FLOWING BETWEEN THE BAGS.

INSPECTION AND MAINTENANCE GUIDELINES
1. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.

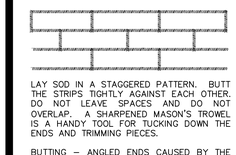
2. REMOVE SEDIMENT WHEN BUILDUP REACHES A DEPTH OF 3 INCHES. REMOVED SEDIMENT SHOULD BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MATTER THAT IT WILL NOT ERODE.

3. CHECK PLACEMENT OF DEVICE TO PREVENT GAPS BETWEEN DEVICE AND CURB.

4. INSPECT FILTER FABRIC AND PATCH OR REPLACE IF TORN OR MISSING.

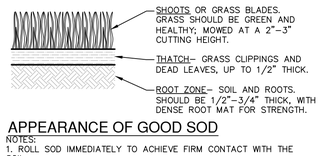
5. STRUCTURES SHOULD BE REMOVED AND THE AREA STABILIZED ONLY AFTER THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

BAGGED GRAVEL GRATE INLET PROTECTION DETAIL
NOT–TO–SCALE

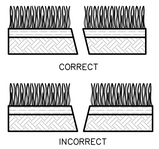


LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER. DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARPENED MASON'S TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.

BUTTING – ANGLED ENDS CAUSED BY THE AUTOMATIC SOD CUTTER MUST BE MATCHED CORRECTLY.



APPEARANCE OF GOOD SOD

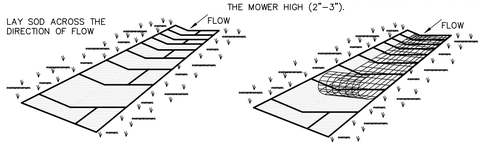


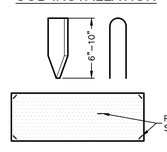
SOD INSTALLATION

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").





USE PEGS OR STAPLES TO FASTEN SOD FIRMLY – AT THE ENDS OF STRIPS AND IN THE CENTER, OR EVERY 3–4 FEET IF THE STRIPS ARE LONG. WHEN READY TO MOW, DRIVE PEGS OR STAPLES FLUSH WITH THE GROUND.

MATERIALS
1. SOD SHOULD BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 3/4" INCH (± 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 SIZE AND 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.

GENERAL INSTALLATION (VA. DEPT. OF CONSERVATION, 1992)
1. SOD SHOULD NOT BE CUT OR LAID IN EXCESSIVELY WET OR DRY WEATHER. SOD ALSO SHOULD NOT BE LAID ON SOIL SURFACES THAT ARE FROZEN.

2. DURING PERIODS OF HIGH TEMPERATURE, THE SOIL SHOULD BE LIGHTLY IRRIGATED IMMEDIATELY PRIOR TO LAYING THE SOD, TO COOL THE SOIL AND REDUCE ROOT BURNING AND DIEBACK.

3. THE FIRST ROW OF SOD SHOULD BE LAID IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO AND BUTTING TIGHTLY AGAINST EACH OTHER. LATERAL JOINTS SHOULD BE STAGGERED TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. CARE SHOULD BE EXERCISED TO ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE DRYING OF THE ROOTS (SEE FIGURE ABOVE).

4. ON SLOPES 3:1 OR GREATER, OR WHEREVER EROSION MAY BE A PROBLEM, SOD SHOULD BE LAID WITH STAGGERED JOINTS AND SECURED BY STAPLING OR OTHER APPROVED METHODS. SOD SHOULD BE INSTALLED WITH THE LENGTH PERPENDICULAR TO THE SLOPE (ON CONTOUR).

5. AS SODDING OF CLEARLY DEFINED AREAS IS COMPLETED, SOD SHOULD BE ROLLED OR TAMPED TO PROVIDE FIRM CONTACT BETWEEN ROOTS AND SOIL.

6. AFTER ROLLING, SOD SHOULD BE IRRIGATED TO A DEPTH SUFFICIENT THAT THE UNDERSIDE OF THE SOD PAD AND THE SOIL 4 INCHES BELOW THE SOD IS THOROUGHLY WET.

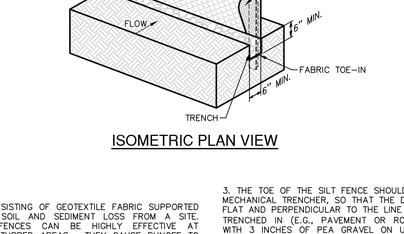
7. UNTIL SUCH TIME A GOOD ROOT SYSTEM BECOMES DEVELOPED, IN THE ABSENCE OF ADEQUATE RAINFALL, WATERING SHOULD BE PERFORMED AS OFTEN AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF AT LEAST 4 INCHES.

8. THE FIRST MOWING SHOULD NOT BE ATTEMPTED UNTIL THE SOD IS FIRMLY ROOTED, USUALLY 2–3 WEEKS. NOT MORE THAN ONE THIRD OF THE GRASS LEAF SHOULD BE REMOVED AT ANY ONE CUTTING.

INSPECTION AND MAINTENANCE GUIDELINES
1. SOD SHOULD BE INSPECTED WEEKLY AND AFTER EACH RAIN EVENT TO LOCATE AND REPAIR ANY DAMAGE.

2. DAMAGE FROM STORMS OR NORMAL CONSTRUCTION ACTIVITIES SUCH AS TIRE RUTS OR DISTURBANCE OF SWALE STABILIZATION SHOULD BE REPAIRED AS SOON AS PRACTICAL.

SOD INSTALLATION 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 BRINDELL HARDNESS EXCEEDING 140.

3. WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.

3. THE TOE OF THE SILT FENCE SHOULD BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWN–SLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G., PAVEMENT OR ROCK OUTCROP), WEIGHT FABRIC FLAP WITH 3 INCHES OF PEA GRAVEL ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.

4. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.

5. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHOULD BE A 3–FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.

6. SILT FENCE SHOULD BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

COMMON TROUBLE POINTS
1. FENCE NOT INSTALLED ALONG THE CONTOUR CAUSING WATER TO CONCENTRATE AND FLOW OVER THE FENCE.

2. FABRIC NOT SEATED SECURELY TO GROUND (RUNOFF PASSING UNDER FENCE).

3. FENCE NOT INSTALLED PERPENDICULAR TO FLOW LINE (RUNOFF ESCAPING AROUND SIDES).

4. FENCE TREATING TOO LARGE AN AREA, OR EXCESSIVE CHANNEL FLOW (RUNOFF OVERTOPS OR COLLAPSES FENCE).

INSPECTION AND MAINTENANCE GUIDELINES
1. INSPECT ALL FENCING WEEKLY, AND AFTER RAINFALL.

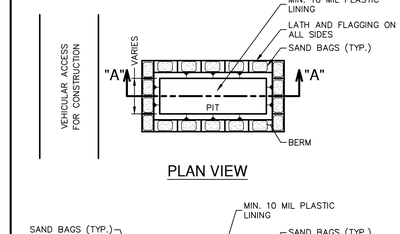
2. REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.

3. REPLACE TORN FABRIC OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE TORN SECTION.

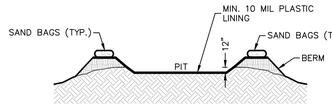
4. REPLACE OR REPAIR SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY. IF A SECTION OF FENCE IS OBSTRUCTING VEHICULAR ACCESS, CONSIDER RELOCATING IT TO A SPOT WHERE IT WILL PROVIDE EQUAL PROTECTION, BUT WILL NOT OBSTRUCT VEHICLES. A TRIANGULAR FILTER DIKE MAY BE PREFERABLE TO A SILT FENCE AT COMMON VEHICLE ACCESS POINTS.

5. WHEN CONSTRUCTION IS COMPLETE, THE SEDIMENT SHOULD BE DISPOSED OF IN A MANNER THAT WILL NOT CAUSE ADDITIONAL SILTATION AND THE PRIOR LOCATION OF THE SILT FENCE SHOULD BE REVEGETATED. THE FENCE ITSELF SHOULD BE DISPOSED OF IN AN APPROVED LANDFILL.

SILT FENCE DETAIL
NOT–TO–SCALE



PLAN VIEW



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.

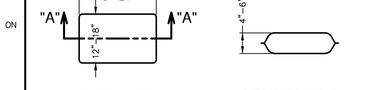
MATERIALS
PLASTIC LINING MATERIAL SHOULD BE A MINIMUM OF 10 MIL IN POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL.

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

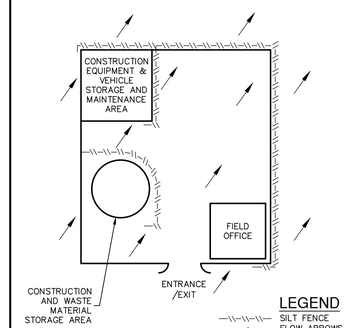
SECTION "A-A"

NOTES:
1. THE FILTER BAG MATERIAL SHALL BE MADE OF POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN FABRIC, MIN. UNIT WEIGHT OF 4 OUNCES/SY, HAVE A MULLEN BURST STRENGTH EXCEEDING 300 PSI AND ULTRAVIOLET STABILITY EXCEEDING 70%.

2. THE FILTER BAG SHALL BE FILLED WITH CLEAN, MEDIUM WASHED PEA GRAVEL TO COARSE GRAVEL (0.31 TO 0.75 INCH DIAMETER).

3. SAND SHALL NOT BE USED TO FILL THE FILTER BAGS.

GRAVEL FILTER BAG DETAIL
NOT–TO–SCALE



CONSTRUCTION STAGING AREA
NOT–TO–SCALE

THE ENGINEERING SEAL HAS BEEN AFFIXED TO THIS SHEET ONLY FOR THE PURPOSE OF DEMONSTRATING COMPLIANCE WITH THE TPDES–STORM WATER POLLUTION PREVENTION PLAN (SWP3) REGULATIONS.

THIS SHEET HAS BEEN PREPARED FOR PURPOSES OF THE SWP3 ONLY. ALL OTHER CIVIL ENGINEERING RELATED INFORMATION SHOULD BE ACQUIRED FROM THE APPROPRIATE SHEET IN THE CIVIL IMPROVEMENT PLANS.

EXHIBIT 3

NO.	REVISION	DATE

5–16–2024

STATE OF TEXAS
JOCELYN PEREZ
98367
LICENSED
PROFESSIONAL ENGINEER

PAPE–DAWSON ENGINEERS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5603
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #100288000

VERAMENDI S8-S10
NEW BRAUNFELS, TEXAS
STORM WATER POLLUTION PREVENTION DETAILS

PLAT NO.
JOB NO. 30001–80
DATE MAY 2024
DESIGNER CK
CHECKED CK DRAWN MG
SHEET C2.10

Date: May 16, 2024, 10:07 AM – User ID: MGonceres
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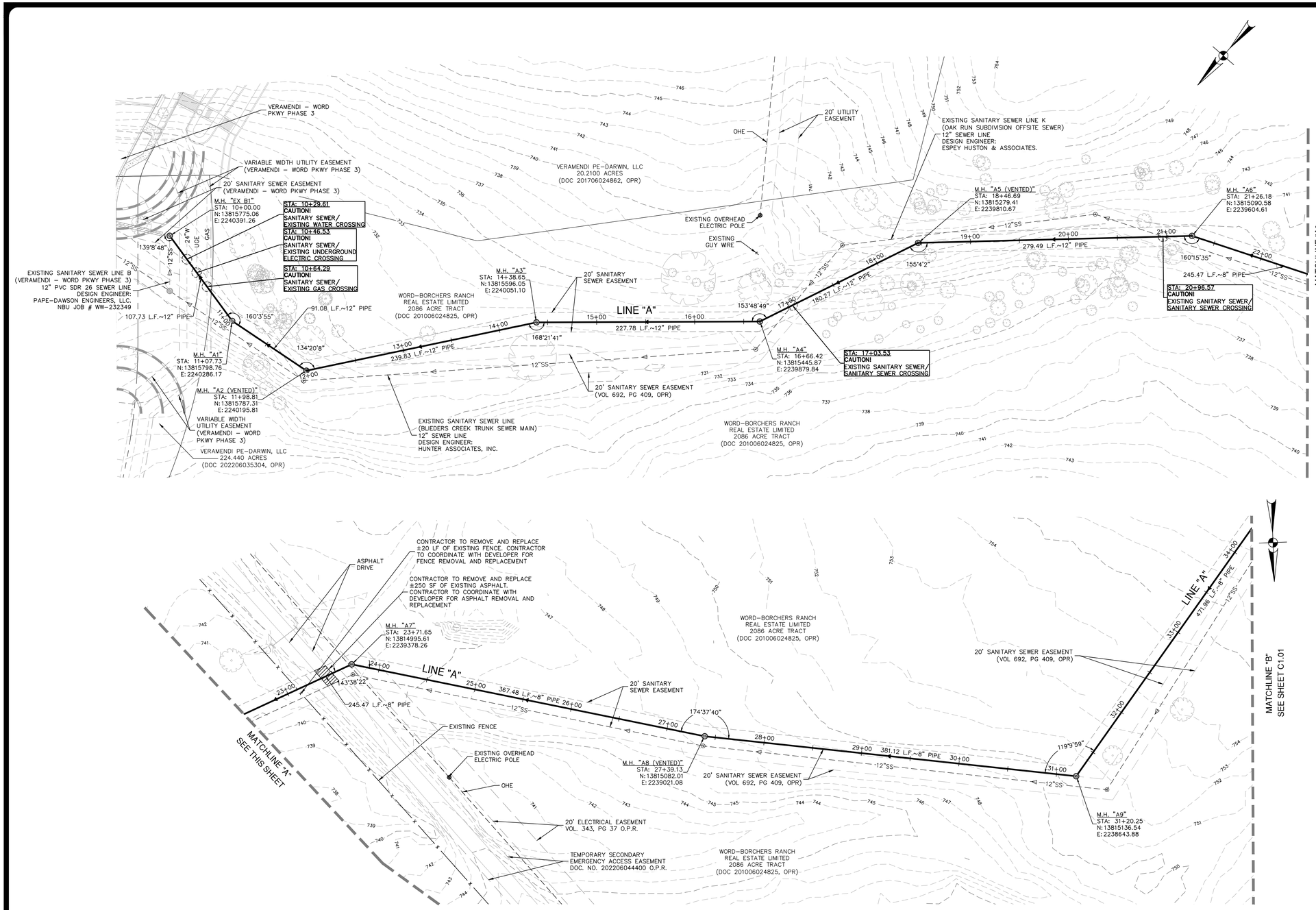
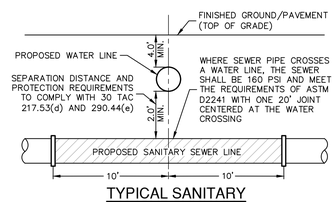
FINAL PLAN AND PROFILE SHEETS

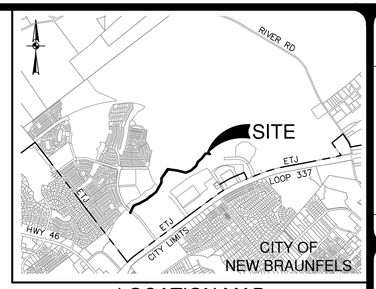


WASTEWATER (NBU JOB NO. WW-_____)		
ITEM	UNIT	QUANTITY
8" SANITARY SEWER PIPE	LF	3,535
12" SANITARY SEWER PIPE	LF	1,126
LUEs	EA	1634
48" MANHOLES	EA	17



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE



LOCATION MAP

NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

SEWER LEGEND

- PROJECT LIMITS
- EXISTING WATER (W)
- EXISTING UNDERGROUND ELECTRIC (UGE)
- EXISTING GAS (G)
- EXISTING SEWER (SS)
- PROPOSED SEWER (SS, MANHOLE)
- PROPOSED WATER (FIRE HYDRANT, W)
- PROPOSED SEWER LATERAL (S)
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- PROPOSED UNDERGROUND ELECTRIC (UGE)
- EXISTING TREE TO REMAIN

FLOODPLAIN NOTE

1. NO PORTION OF ANY LOT ON THIS PROJECT IS WITHIN AN INDICATED SPECIAL FLOOD HAZARD ZONE ACCORDING TO THE FEMA FIRM MAP NO. 48091C0435F EFFECTIVE DATE 9/2/2009.

CITY OF NEW BRAUNFELS NOTES

1. NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.
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4. UTILITY TRENCH COMPACTION – 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.

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TRENCH EXCAVATION SAFETY PROTECTION:

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NO.	REVISION	DATE

5-16-2024

STATE OF TEXAS
JOCELYN PEREZ
98367
LICENSED
PROFESSIONAL ENGINEER

PAPE-DAWSON ENGINEERS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5603
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #100288-00

VERAMENDI S8-S10

NEW BRAUNFELS, TEXAS

OVERALL SANITARY SEWER PLAN

PLAT NO. _____
JOB NO. 30001-80
DATE MAY 2024
DESIGNER CK
CHECKED CK DRAWN MG
SHEET C1.00

Date: May 16, 2024, 9:54 AM – User ID: MGarcieras
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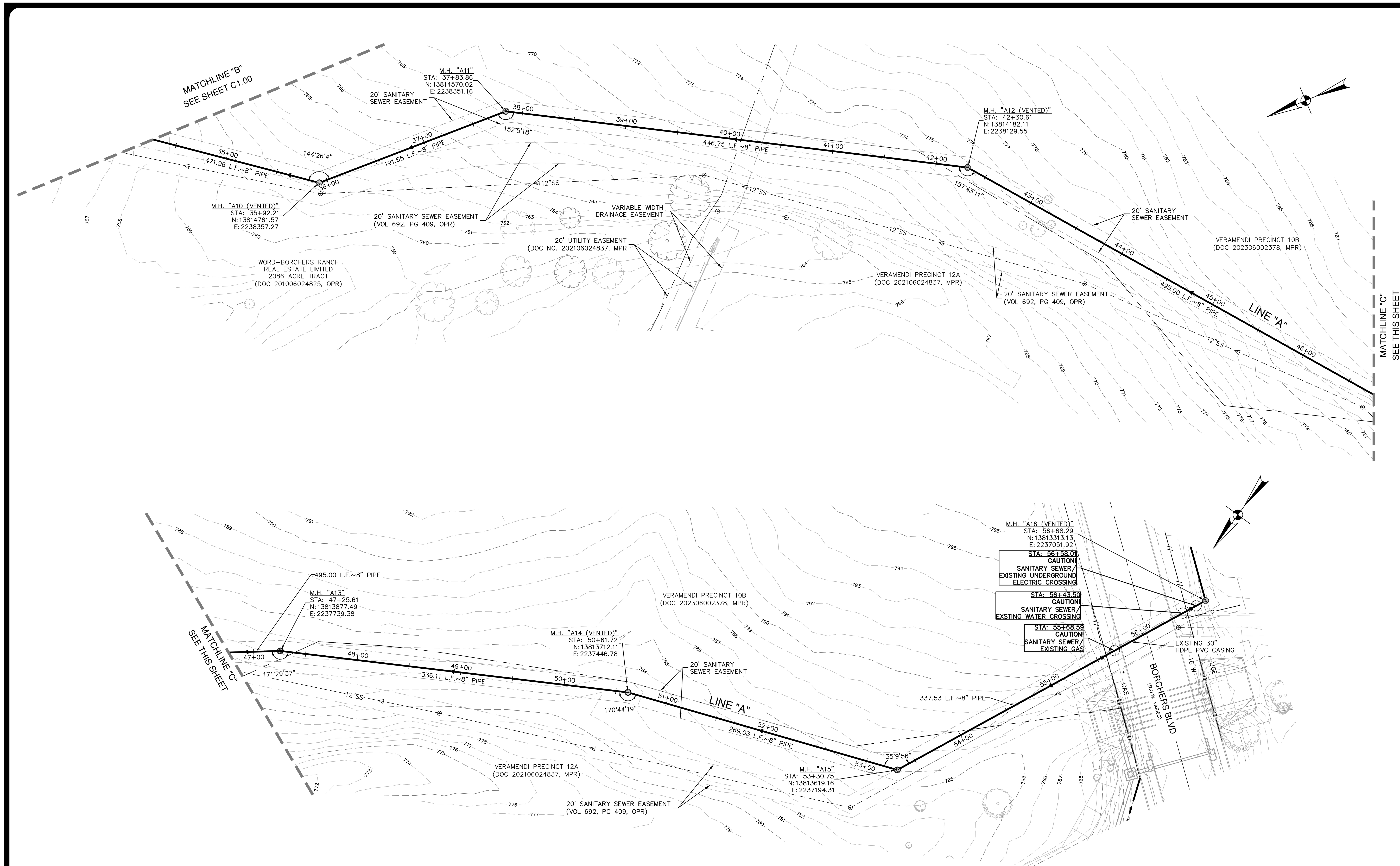

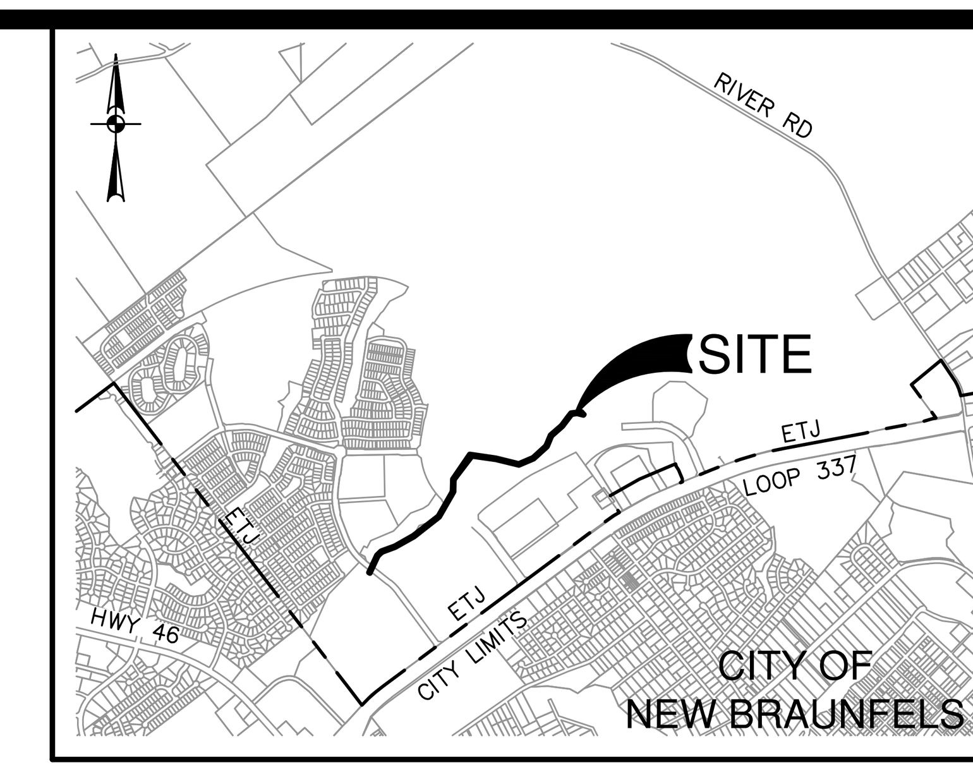

LOCATION MAP

NOT-TO-SCALE

SCALE: 1" = 50'

0' 50' 100' 150'

SEWER LEGEND

- PROJECT LIMITS
- EXISTING FIRE HYDRANT
- EXISTING WATER — W —
- EXISTING UNDERGROUND ELECTRIC — UGE —
- EXISTING GAS — G —
- EXISTING SEWER — SS —
- PROPOSED SEWER — SS — MANHOLE
- PROPOSED WATER — W — FIRE HYDRANT
- PROPOSED SEWER LATERAL — S
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- PROPOSED UNDERGROUND ELECTRIC — UGE —
- EXISTING TREE TO REMAIN

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WASTEWATER (NBU JOB NO. WW-_____)		
ITEM	UNIT	QUANTITY
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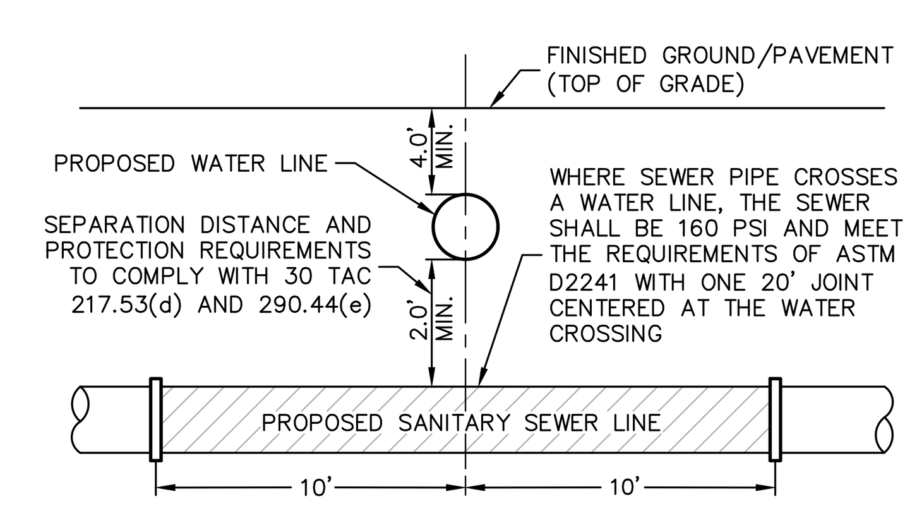
12" SANITARY SEWER PIPE	LF	1,126
LUEs	EA	1634
48" MANHOLES	EA	17



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

NO.	REVISION	DATE

5-16-2024

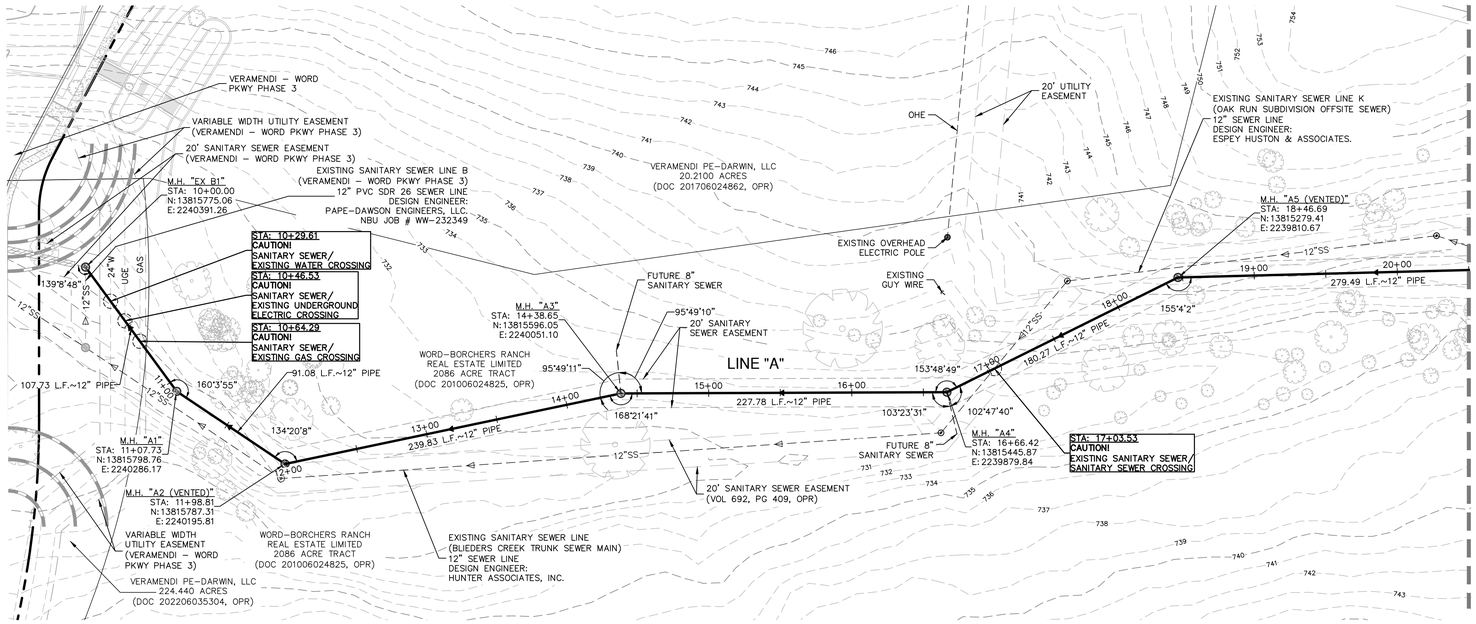
STATE OF TEXAS
JOCELYN PEREZ
98367
LICENSED
PROFESSIONAL ENGINEER

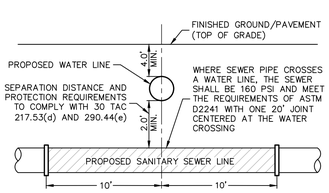
PAPE-DAWSON ENGINEERS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

VERAMENDI S8-S10
NEW BRAUNFELS, TEXAS

OVERALL SANITARY SEWER PLAN

PLAT NO. ________
JOB NO. 30001-80
DATE MAY 2024
DESIGNER CK
CHECKED CK DRAWN MG
SHEET C1.01





TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

SCALE: 1"= 50'

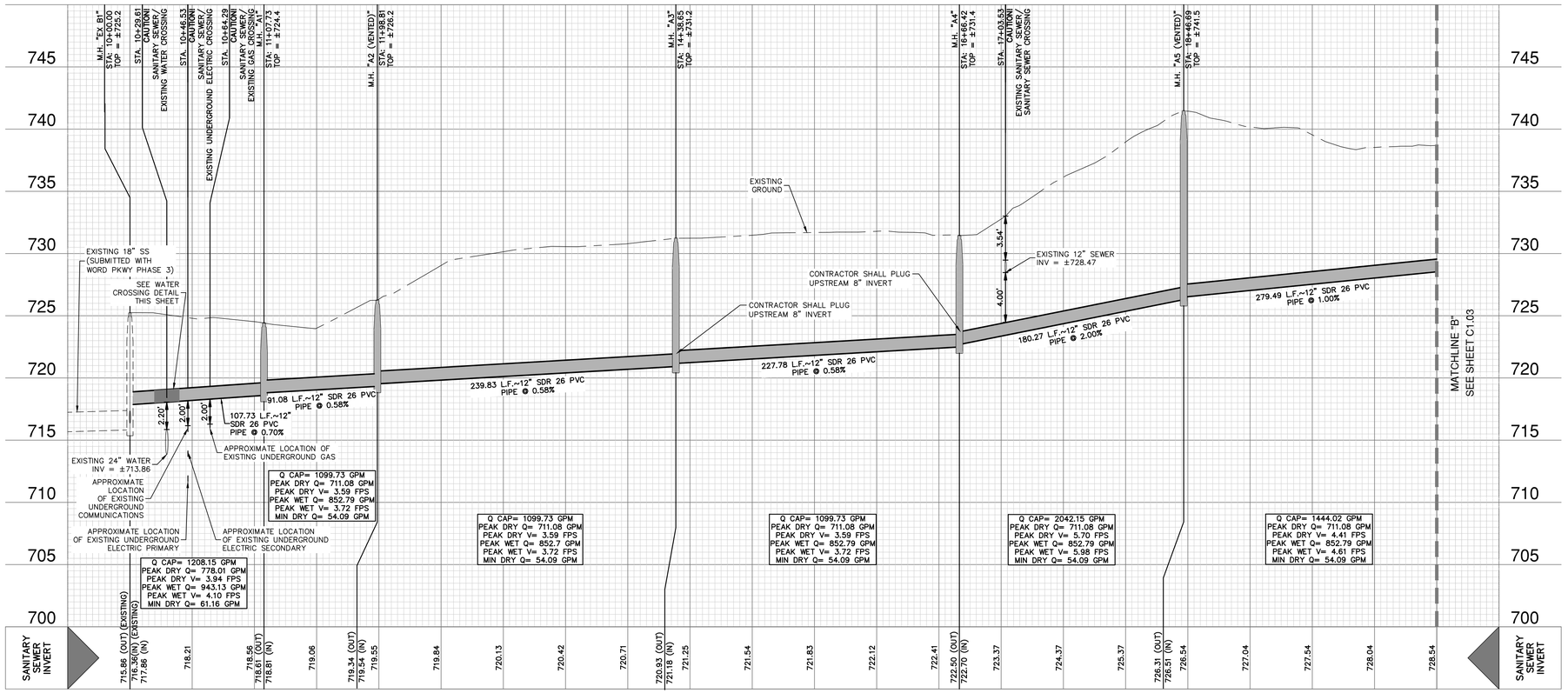
0' 50' 100' 150'

SEWER LEGEND

- PROJECT LIMITS
- EXISTING FIRE HYDRANT
- EXISTING WATER — W —
- EXISTING UNDERGROUND ELECTRIC — UGE —
- EXISTING GAS — G —
- EXISTING SEWER — SS —
- PROPOSED SEWER — SS — MANHOLE
- PROPOSED WATER — W — FIRE HYDRANT
- PROPOSED SEWER LATERAL — S
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- PROPOSED UNDERGROUND ELECTRIC — UGE —
- EXISTING TREE TO REMAIN

SANITARY SEWER LINE "A"
STA 10+00.00 TO 20+50.00

VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'



NOTES

1. SEWER PIPE WHERE WATER LINE CROSSES SHALL BE 160 P.S.I. AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT WATER MAIN.
2. NO VERTICAL STACKS ALLOWED FOR ANY LOTS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
3. WHEN HORIZONTAL DISTANCE BETWEEN SEWER PIPES AND WATER MAIN IS LESS THAN 9 FOOT OF SEPARATION, SEWER MAIN SHALL BE INSTALLED WITH 150 PSI (MIN) PRESSURE PIPE AND FITTINGS IN ACCORDANCE WITH NBU'S WATER CONNECTION POLICY IN THE VICINITY OF WATER MAINS. (SEE SEWER NOTES SHEET C1.10)
4. CONTRACTOR SHALL ENSURE THAT MANHOLES OUTSIDE OF PAVED AREAS ARE SET WITH TOP ELEVATIONS 2" ABOVE FINISHED GRADE WITH CONCRETE RING ENCASEMENT. CONTRACTOR SHALL ENSURE THAT MANHOLES IN PAVED AREAS ARE SET TO MATCH TOP OF FINISHED GRADE.
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NOTE:
FOR PAVEMENT DESIGN SECTION SEE GEOTECHNICAL ENGINEERING REPORT.

CAUTION!!

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NO.	REVISION	DATE

STATE OF TEXAS
JOCELYN PEREZ
98367
LICENSED
PROFESSIONAL ENGINEER
5–16–2024

PAPE-DAWSON ENGINEERS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5603
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #100288-00

VERAMENDI S8-S10
NEW BRAUNFELS, TEXAS
SANITARY SEWER LINE A - PLAN & PROFILE
STA 10+00.00 TO 20+50.00

PLAT NO.
JOB NO. 30001-80
DATE MAY 2024
DESIGNER CK
CHECKED CK DRAWN MG
SHEET C1.02

Date: May 16, 2024, 9:56 AM — User ID: MGonceres
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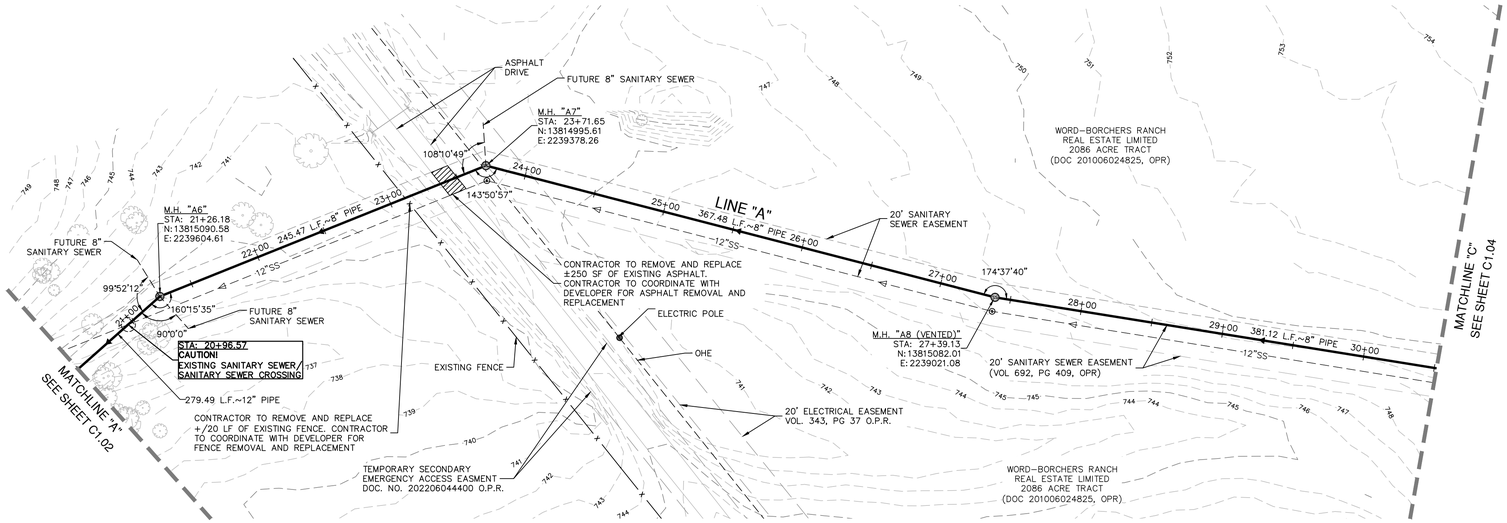
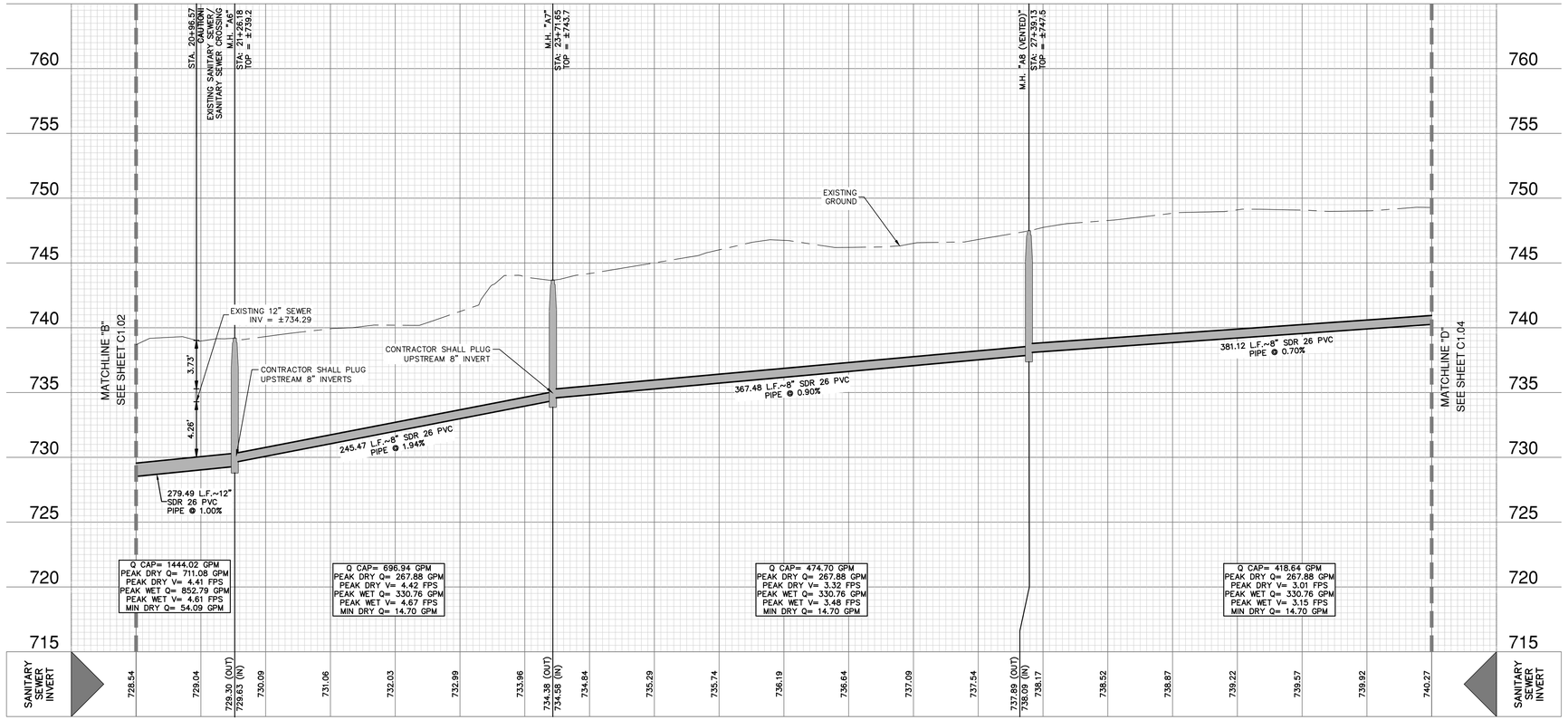
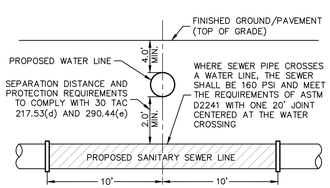


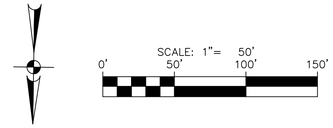
SANITARY SEWER LINE "A"
STA 20+50.00 TO 30+50.00

VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'





TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NOT-TO-SCALE



SEWER LEGEND

- PROJECT LIMITS
- EXISTING FIRE HYDRANT
- EXISTING WATER — W —
- EXISTING UNDERGROUND ELECTRIC — UGE —
- EXISTING GAS — G —
- EXISTING SEWER — SS —
- PROPOSED SEWER — SS — MANHOLE
- FIRE HYDRANT
- PROPOSED WATER — W —
- PROPOSED SEWER LATERAL — S —
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- PROPOSED UNDERGROUND ELECTRIC — UGE —
- EXISTING TREE TO REMAIN

NOTES

1. SEWER PIPE WHERE WATER LINE CROSSES SHALL BE 160 P.S.I. AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT WATER MAIN.
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NO.	REVISION	DATE

5-16-2024

STATE OF TEXAS
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98367
LICENSED
PROFESSIONAL ENGINEER

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672 INDEPENDENCE DR, STE 102 I NEW BRAUNFELS, TX 78132 I 830.632.5603
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #100288-00

VERAMENDI S8-S10
NEW BRAUNFELS, TEXAS
SANITARY SEWER LINE A - PLAN & PROFILE
STA 20+50.00 TO 30+50.00

PLAT NO.
JOB NO. 30001-80
DATE MAY 2024
DESIGNER CK
CHECKED CK DRAWN MG
SHEET C1.03

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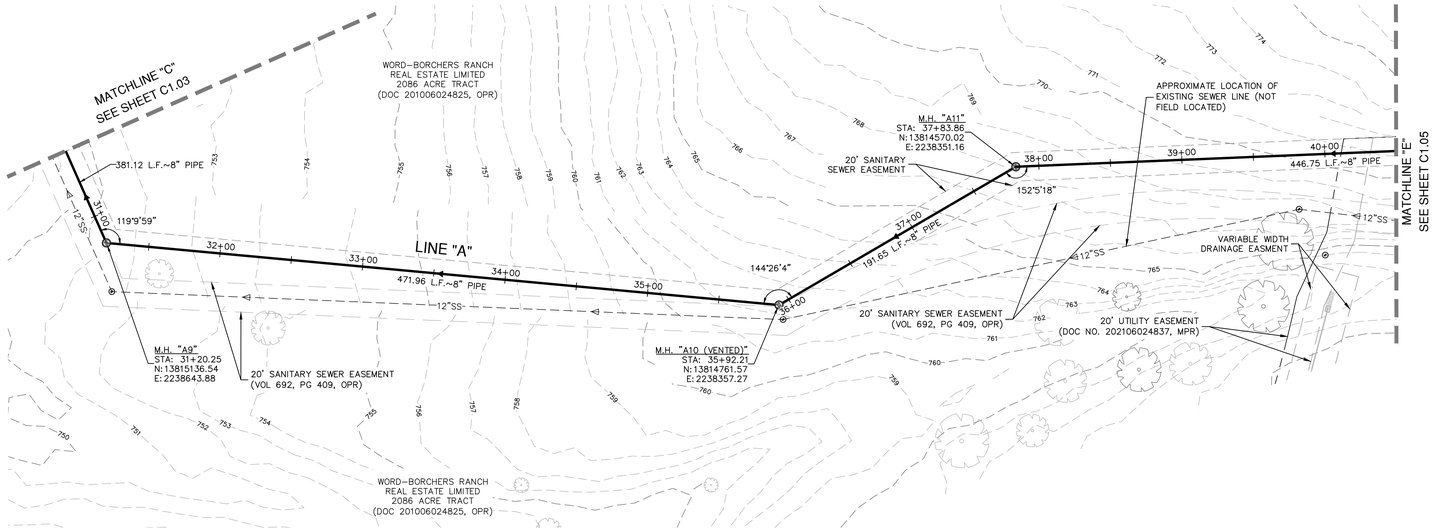

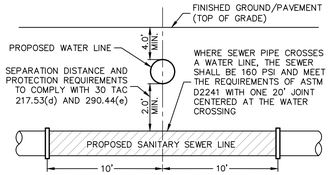

TYPICAL SANITARY
SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

SEWER LEGEND

PROJECT LIMITS

EXISTING FIRE HYDRANT

EXISTING WATER — W —

EXISTING UNDERGROUND ELECTRIC — UGE —

EXISTING GAS — G —

EXISTING SEWER — SS — MANHOLE

PROPOSED SEWER — SS —

FIRE HYDRANT

PROPOSED WATER — W —

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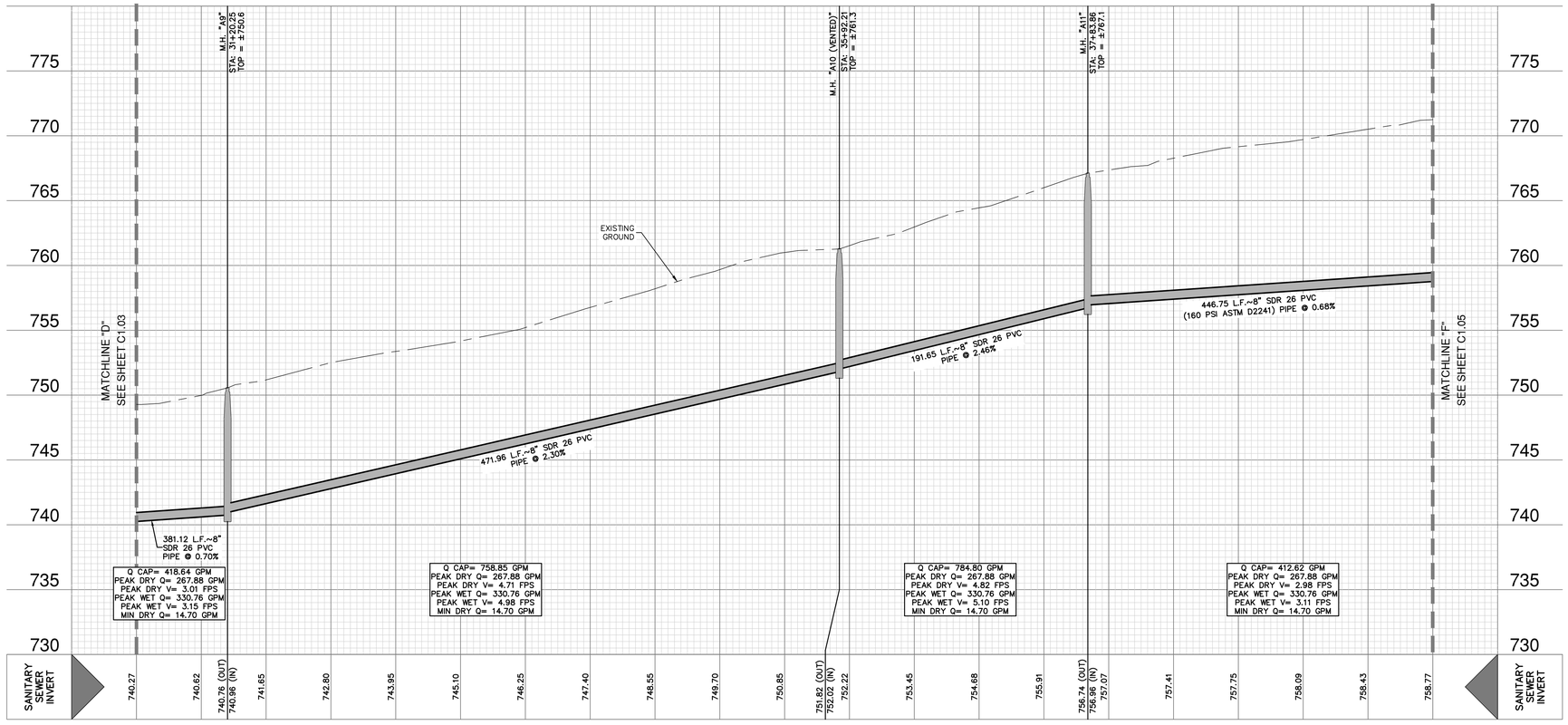

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672 INDEPENDENCE DR, STE 102 I NEW BRAUNFELS, TX 78132 I 830.632.5603
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #100288800

VERAMENDI S8-S10

NEW BRAUNFELS, TEXAS

SANITARY SEWER LINE A - PLAN & PROFILE
STA 30+50.00 TO 40+50.00

PLAT NO.
JOB NO. 30001-80
DATE MAY 2024
DESIGNER CK
CHECKED CK DRAWN MG
SHEET C1.04

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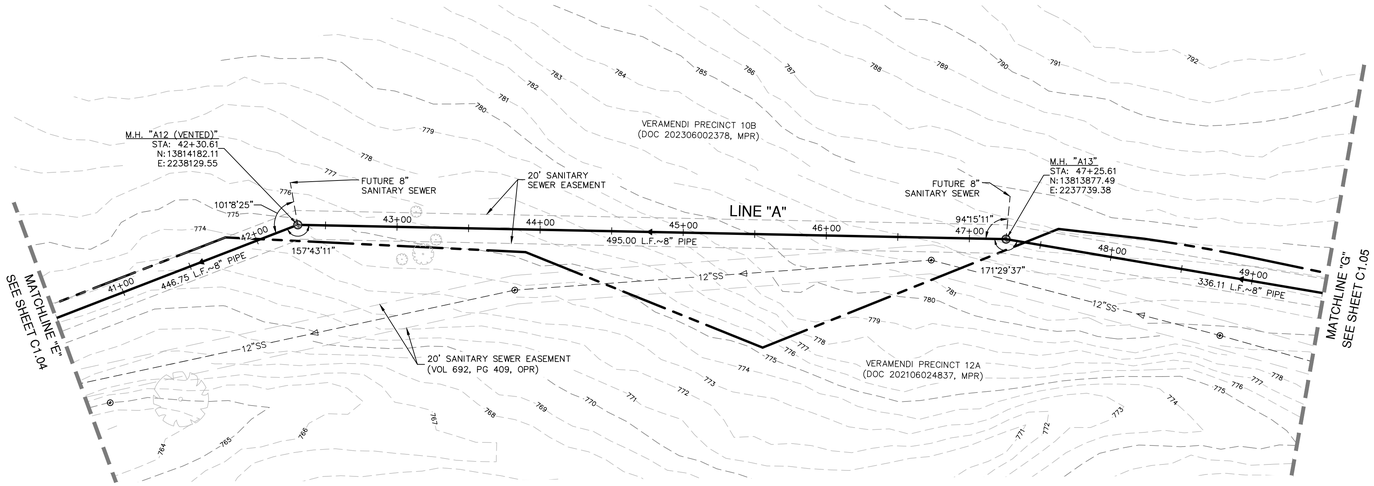

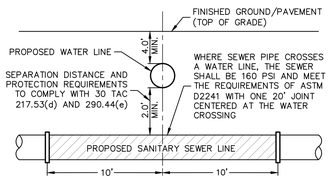

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

SEWER LEGEND

- PROJECT LIMITS
- EXISTING FIRE HYDRANT
- EXISTING WATER — W —
- EXISTING UNDERGROUND ELECTRIC — UGE —
- EXISTING GAS — G —
- EXISTING SEWER — SS — MANHOLE
- PROPOSED SEWER — SS —
- FIRE HYDRANT
- PROPOSED WATER — W —
- PROPOSED SEWER LATERAL — S —
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
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- EXISTING TREE TO REMAIN

SANITARY SEWER LINE "A"
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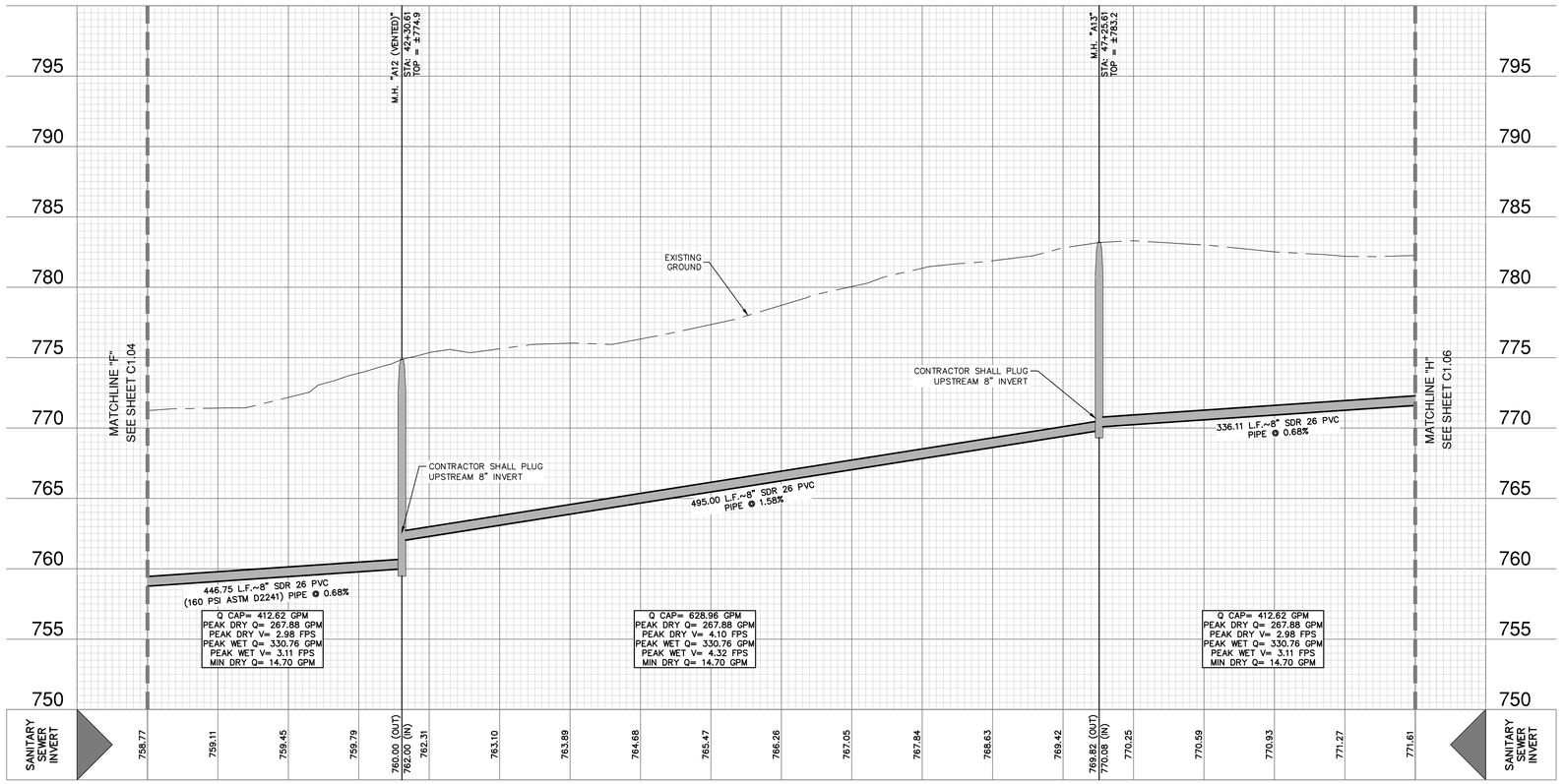

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TRENCH EXCAVATION SAFETY PROTECTION:

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 COMPLY 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.

NO.	REVISION	DATE

5-16-2024

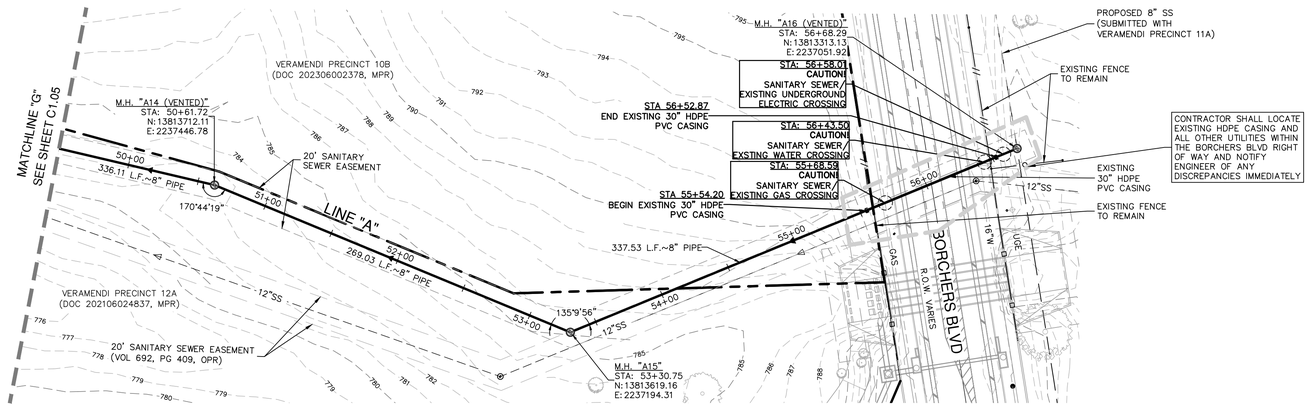
STATE OF TEXAS
JOCELYN PEREZ
98367
LICENSED
PROFESSIONAL ENGINEER

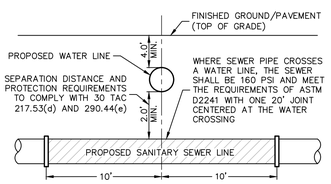
PAPE-DAWSON ENGINEERS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5603
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #100288800

VERAMENDI S8-S10
NEW BRAUNFELS, TEXAS

SANITARY SEWER LINE A - PLAN & PROFILE
STA 40+50.00 TO 49+50.00

PLAT NO.
JOB NO. 30001-80
DATE MAY 2024
DESIGNER CK
CHECKED CK DRAWN MG
SHEET C1.05





TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

SEWER LEGEND

PROJECT LIMITS

EXISTING WATER — EXISTING FIRE HYDRANT — W

EXISTING UNDERGROUND ELECTRIC — UGE

EXISTING GAS — G

EXISTING SEWER — SS — MANHOLE

PROPOSED SEWER — SS

PROPOSED WATER — FIRE HYDRANT — W

PROPOSED SEWER LATERAL — S

PROPOSED STORM DRAIN

EXISTING STORM DRAIN

PROPOSED UNDERGROUND ELECTRIC — UGE

EXISTING TREE TO REMAIN

SANITARY SEWER LINE "A"
STA 49+50.00 TO 56+68.29

VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'

NOTES

1. SEWER PIPE WHERE WATER LINE CROSSES SHALL BE 160 P.S.I. AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT WATER MAIN.
2. NO VERTICAL STACKS ALLOWED FOR ANY LOTS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
3. WHEN HORIZONTAL DISTANCE BETWEEN SEWER PIPES AND WATER MAIN IS LESS THAN 9 FOOT OF SEPARATION, SEWER MAIN SHALL BE INSTALLED WITH 150 PSI (MIN) PRESSURE PIPE AND FITTINGS IN ACCORDANCE WITH NBU'S WATER CONNECTION POLICY IN THE VICINITY OF WATER MAINS. (SEE SEWER NOTES SHEET C1.10)
4. CONTRACTOR SHALL ENSURE THAT MANHOLES OUTSIDE OF PAVED AREAS ARE SET WITH TOP ELEVATIONS 2" ABOVE FINISHED GRADE WITH CONCRETE RING ENCASEMENT. CONTRACTOR SHALL ENSURE THAT MANHOLES IN PAVED AREAS ARE SET TO MATCH TOP OF FINISHED GRADE.
5. ALL SEWER PIPES SHALL BE 8" PVC (SDR 26), UNLESS OTHERWISE NOTED.
6. CONTRACTOR IS TO VERIFY EXISTING INVERT OF SANITARY SEWER MAIN AND ALERT ENGINEER IMMEDIATELY OF ANY DIFFERENCE FROM INVERT SHOWN ON PLANS.
7. CONTRACTOR SHALL PROTECT ALL EXISTING FENCES. ANY FENCE DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT THEIR EXPENSE.
8. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES AND DRAINAGE STRUCTURES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES PRIOR TO CONSTRUCTION TO VERIFY SIZE, GRADE, AND LOCATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DEVIATIONS FROM PLANS PRIOR TO BEGINNING CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR, AT HIS EXPENSE.
9. SEE THIS SHEET FOR TYPICAL SANITARY SEWER/WATER CROSSING DETAIL.
10. IF A CONFLICT EXISTS BETWEEN THE VARIOUS SUBMITTED DOCUMENTS (ENGINEERING CALCULATIONS, PROJECTED SPECIFICATIONS, PROJECTED PLANS, ADDENDUMS, ETC.), THE FOLLOWING DOCUMENTS TAKE PRECEDENT: SPECIFICATIONS GOVERN OVER PLANS, SPECIAL CONDITIONS GOVERN OVER SPECIFICATIONS AND PLANS. ADDENDUMS TAKE PRECEDENCE OVER ALL.
11. LAST 20 L.F. OF 8" STUB-OUT SHALL BE CONSTRUCTED OF P.V.C. SDR 26 (160 P.S.I.) PRESSURE PIPE.
12. ALL SEWER PIPE LATERALS SHALL BE SDR 26 (CLASS 160) PVC PIPE.
13. SERVICES SHALL HAVE A MINIMUM OF THIRTY-SIX (36) INCHES OF COVER.

NOTE:
FOR PAVEMENT DESIGN SECTION SEE GEOTECHNICAL ENGINEERING REPORT.

CAUTION!!

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NO.	REVISION	DATE

5-16-2024

STATE OF TEXAS
JOCELYN PEREZ
98367
LICENSED
PROFESSIONAL ENGINEER

PAPE-DAWSON ENGINEERS
672 INDEPENDENCE DR, STE 102 I NEW BRAUNFELS, TX 78132 I 830.632.5603
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #100288-00

VERAMENDI S8-S10
NEW BRAUNFELS, TEXAS
SANITARY SEWER LINE A - PLAN & PROFILE
STA 49+50.00 TO 56+68.29

PLAT NO.
JOB NO. 30001-80
DATE MAY 2024
DESIGNER CK
CHECKED CK DRAWN MG
SHEET C1.06

Date: May 16, 2024, 10:01 AM - User ID: MGanceres
File: P:\30001\80\design\Civil\SSA-30001-80.dwg

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

Edwards Aquifer Protection Program Construction Notes – Legal Disclaimer

The following/listed "construction notes" are intended to be advisory in nature only and do not constitute an approval or conditional approval by the Executive Director, nor do they constitute a comprehensive listing of rules or conditions to be followed during construction. Further actions may be required to achieve compliance with TCEQ regulations found in Title 30, Texas Administrative Code, Chapters 213 and 217, as well as local ordinances and regulations providing for the protection of water quality. Additionally, nothing contained in the following/listed "construction notes" restricts the powers of the Executive Director, the commission or any other governmental entity to prevent, correct, or curtail activities that result or may result in pollution of the Edwards Aquifer or hydrologically connected surface waters. The holder of any Edwards Aquifer Protection Plan containing "construction notes" is still responsible for compliance with Title 30, Texas Administrative Code, Chapters 213 or any other applicable TCEQ regulation, as well as all conditions of an Edwards Aquifer Protection Plan through all phases of plan implementation. Failure to comply with any condition of the Executive Director's approval, whether or not in contradiction of any "construction notes," is a violation of TCEQ regulations and any violation is subject to administrative rules, orders, and penalties as provided under Title 30, Texas Administrative Code § 213.10 (relating to Enforcement). Such violations may also be subject to civil penalties and injunction. The following/listed "construction notes" in no way represent an approved exception by the Executive Director to any part of Title 30 Texas Administrative Code, Chapters 213 and 217, or any other TCEQ applicable regulation.

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

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

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

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

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

6. If any sensitive features are discovered during the wastewater line trenching activities, all regulated activities near the sensitive feature must be suspended immediately. The applicant must immediately notify the appropriate regional office of the TCEQ of the feature discovered. A geologist's assessment of the location and extent of the feature discovered must be reported to that regional office in writing and the applicant must submit a plan for ensuring the structural integrity of the sewer line or for modifying the proposed collection system alignment around the feature. The regulated activities near the sensitive feature may not proceed until the

executive director has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality while maintaining the structural integrity of the line.

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

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

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

   The diameter of the manholes must be a minimum of four feet and the manhole for entry must have a minimum clear opening diameter of 30 inches. These dimensions and other details showing compliance with the commission's rules concerning manholes and sewer line/manhole inverts described in 30 TAC §217.55 are included on Plan Sheet C4.10.

   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: ______________________.

    If pipe flexure is proposed, the following method of preventing deflection of the joint must be used: ______________________.

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

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

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

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

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

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

15. All sewer lines must be tested in accordance with 30 TAC §217.57. The engineer must retain copies of all test results which must be made available to the executive director upon request. The engineer must certify in writing that all wastewater lines have passed all required testing to the appropriate regional office within 30 days of test completion and prior to use of the new collection system. Testing method will be:
    (a) For a collection system pipe that will transport wastewater by gravity flow, the design must specify an infiltration and exfiltration test or a low-pressure air test. A test must conform to the following requirements:
        (1) *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) A pipe must be pressurized to 3.5 pounds per square inch (psi) greater than the pressure exerted by groundwater above the pipe.
                (ii) Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 psi gauge to 2.5 psi gauge is computed from the following equation:

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

Where:

T = time for pressure to drop 1.0 pound per square inch gauge in seconds
K = 0.000419 X D X L, but not less than 1.0
D = average inside pipe diameter in inches

L = length of line of same size being tested, in feet
Q = rate of loss, 0.0015 cubic feet per minute per square foot internal surface

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

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

(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 ASTMs, 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 a pipe. In this case, the ID of the pipe, for the purpose of determining the OD of the mandrel, must equal be the average outside diameter minus two minimum wall thicknesses for OD controlled pipe and the average inside diameter for ID controlled pipe.
            (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 odd number of 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 a case-by-case basis.
    (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 2.0 minutes and with all valves closed, the vacuum is at least 9.0 inches of mercury.

17. All private service laterals must be inspected and certified in accordance with 30 TAC §213.5(c)(3)(I). After installation of and, prior to covering and connecting a private service lateral to an existing organized sewage collection system, a Texas Licensed Professional Engineer, Texas Registered Sanitarian, or appropriate city inspector must visually inspect the private service lateral and the connection to the sewage collection system, and certify that it is constructed in conformity with the applicable provisions of this section. The owner of the collection system must maintain such certifications for five years and forward copies to the appropriate regional office upon request. Connections may only be made to an approved sewage collection system.

Austin Regional Office	San Antonio Regional Office
12100 Park 35 Circle, Building A	14250 Judson Road
Austin, Texas 78753-1808	San Antonio, Texas 78233-4480
Phone (512) 339-2929	Phone (210) 490-3096
Fax (512) 339-3795	Fax (210) 545-4329

THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.

WASTEWATER NOTES:

1. The contractor shall maintain service to existing wastewater system at all times during construction.
2. A minimum of 8" wastewater pipe and fittings (P.V.C. SDR-26, ASTM, D-3034, D-3212, F-477) are required on new installation.
3. All residential wastewater service laterals shall be extended to the property line and a cleanout shall be installed at the property line. Services to lots will extend four (4) feet past the underground electric conduit if electric is installed in the front easement. All sewer cleanouts that lead to NBU mains shall be installed with a protective utility shroud and pivoting marker pole during time of construction.
4. Pipe bedding of wastewater lines shall be manufactured sand or pea gravel as per NBU specifications.
5. Secondary backfill of wastewater 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.
6. All wastewater pipes shall have compression or mechanical joints as per 30 TAC §217.53 (c) (2).
7. For wastewater lines less than 24" in diameter, select initial backfill material shall be placed in two lifts.
   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.
8. 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 third manhole in sequence shall have an alternate means of venting. 30 TAC §213.5 (c) (3) (A) and 30 TAC §217.55 (o).
9. All manholes shall be constructed so that the top of the ring is two inches (2") above surrounding ground except when located in paved area. In paved areas, the manhole ring shall be flush with pavement.
10. All new manholes, unless approved by NBU Engineering, are to have covers with 32" openings.
11. Wastewater pipe connections to pre-cast manholes will be compression joints or mechanical "boot type" joint as approved by NBU.
12. Wastewater lines shall be tested from manhole to manhole.
13. In areas where a new wastewater manhole is to be constructed over an existing wastewater system, it shall be the contactor'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).
14. Where the minimum 9 foot separation distance between wastewater lines and water lines / mains cannot be maintained, the installation of wastewater 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 §217.53 (d) (3) (A) (i).
15. No testing will be performed prior to 30 days from complete installation of the wastewater lines. The following sequence will be strictly adhered to:
    a. Pull mandrel
    b. Perform Air test
    c. Cleaning of any debris
    d. Flushing of system
    e. TV Inspection (within 72 hours of flushing)
16. A minimum of 3 feet of cover is to be maintained over the wastewater main and laterals at subgrade, otherwise concrete encasement will be required.
17. Wastewater main connections made directly to existing manholes will require successful testing of the manhole in accordance with NBU Connection & Construction Policy Manual.
18. TCEQ and EPA require erosion and sedimentation control for construction of wastewater 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.
19. All manholes not within paved streets shall have locking concrete collar to secure ring and cover to manhole cone per NBU Detail drawing #329.
20. 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.

CITY OF NEW BRAUNFELS UTILITY NOTES

1. NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.

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. UTILITY TRENCH COMPACTION – 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.

NBU WATER CONNECTION POLICY 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, EXCEPTING 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 FENCES, CURBS, 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 PERMANENTLY PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN 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 (8), 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:
    19.1. WATER MAINS AND SERVICES
    19.2. 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 COMPACTION WITH STREET R.O.W.

1. ALL UTILITY TRENCH COMPACTION TEST WITHIN THE STREET PAVEMENT SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEO-TECHNICAL ENGINEER.

2. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE.

3. EACH LAYER OF MATERIAL SHALL BE COMPACTED AS SPECIFIED AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEXT METHODS TEX-113-E, TEX-114-E, TEX-115-E.

4. 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.

5. 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.

NO.	REVISION	DATE

5-16-2024
STATE OF TEXAS
JOCELYN PEREZ
98367
LICENSED
PROFESSIONAL ENGINEER

PAPE-DAWSON ENGINEERS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

VERAMENDI S8-S10
NEW BRAUNFELS, TEXAS
SANITARY SEWER NOTES

PLAT NO. ____
JOB NO. 30001-80
DATE MAY 2024
DESIGNER CK
CHECKED CK DRAWN MG
SHEET C1.10

Date: May 16, 2024, 10:02 AM – User ID: MGonceres
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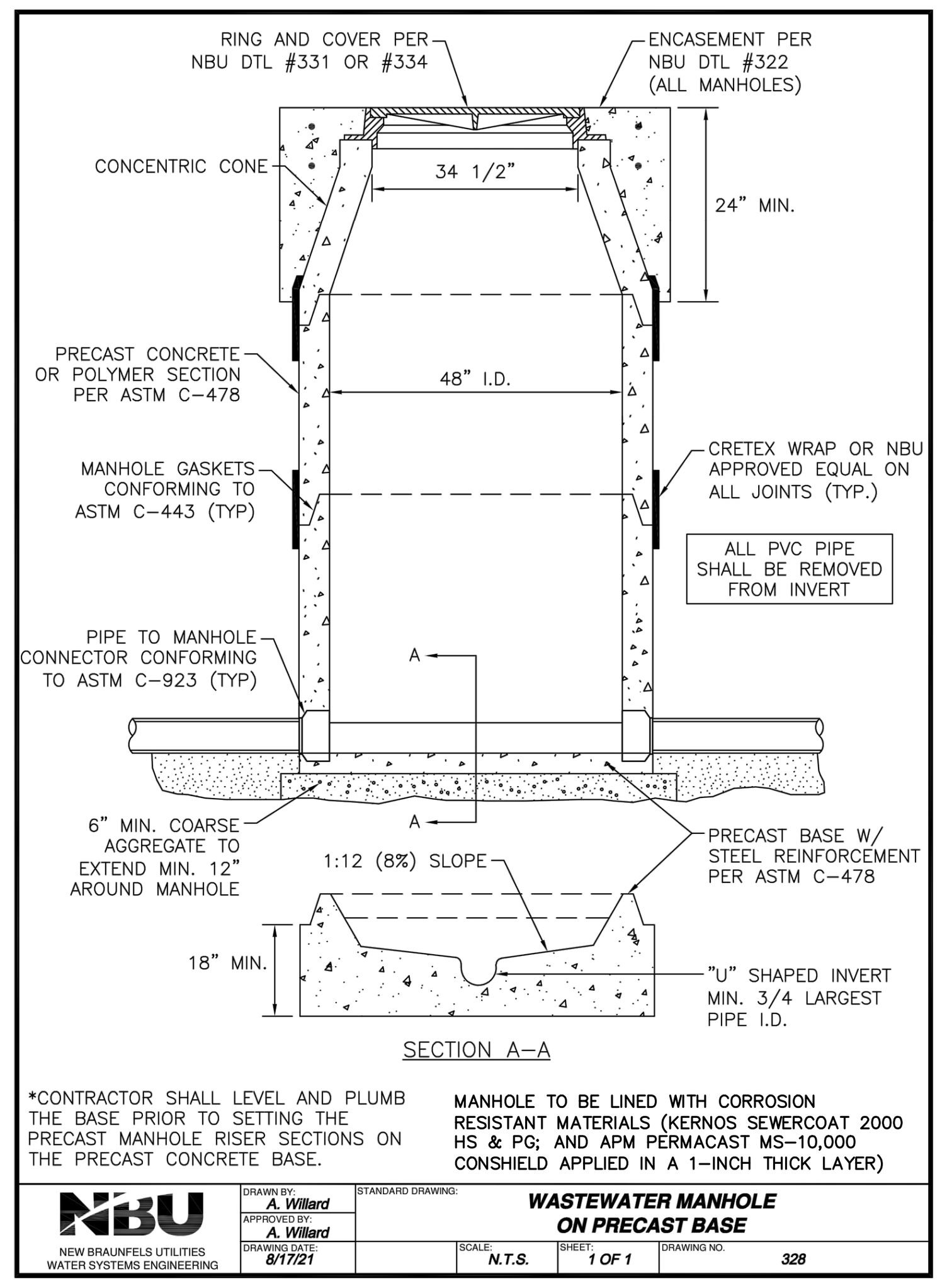
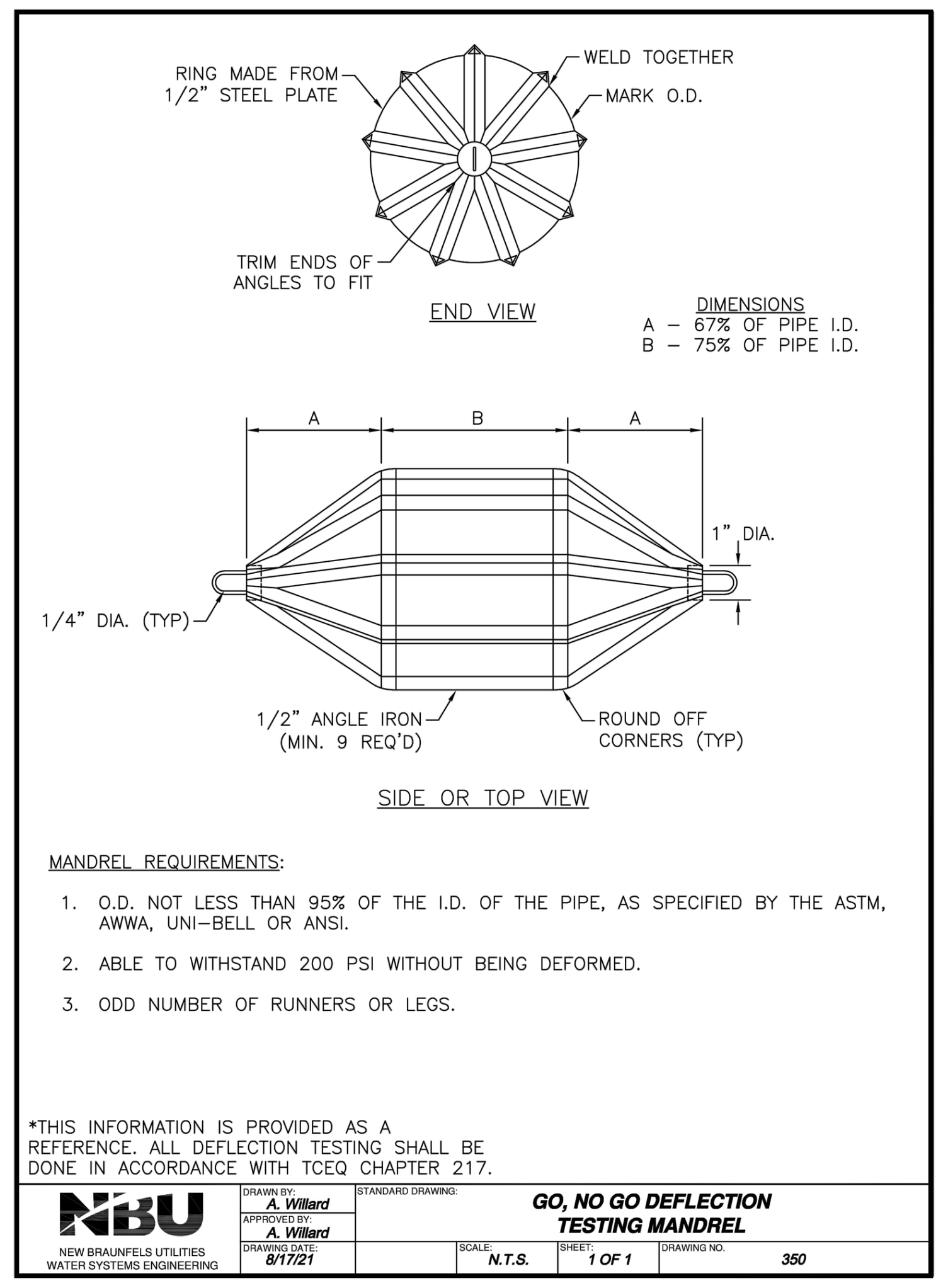
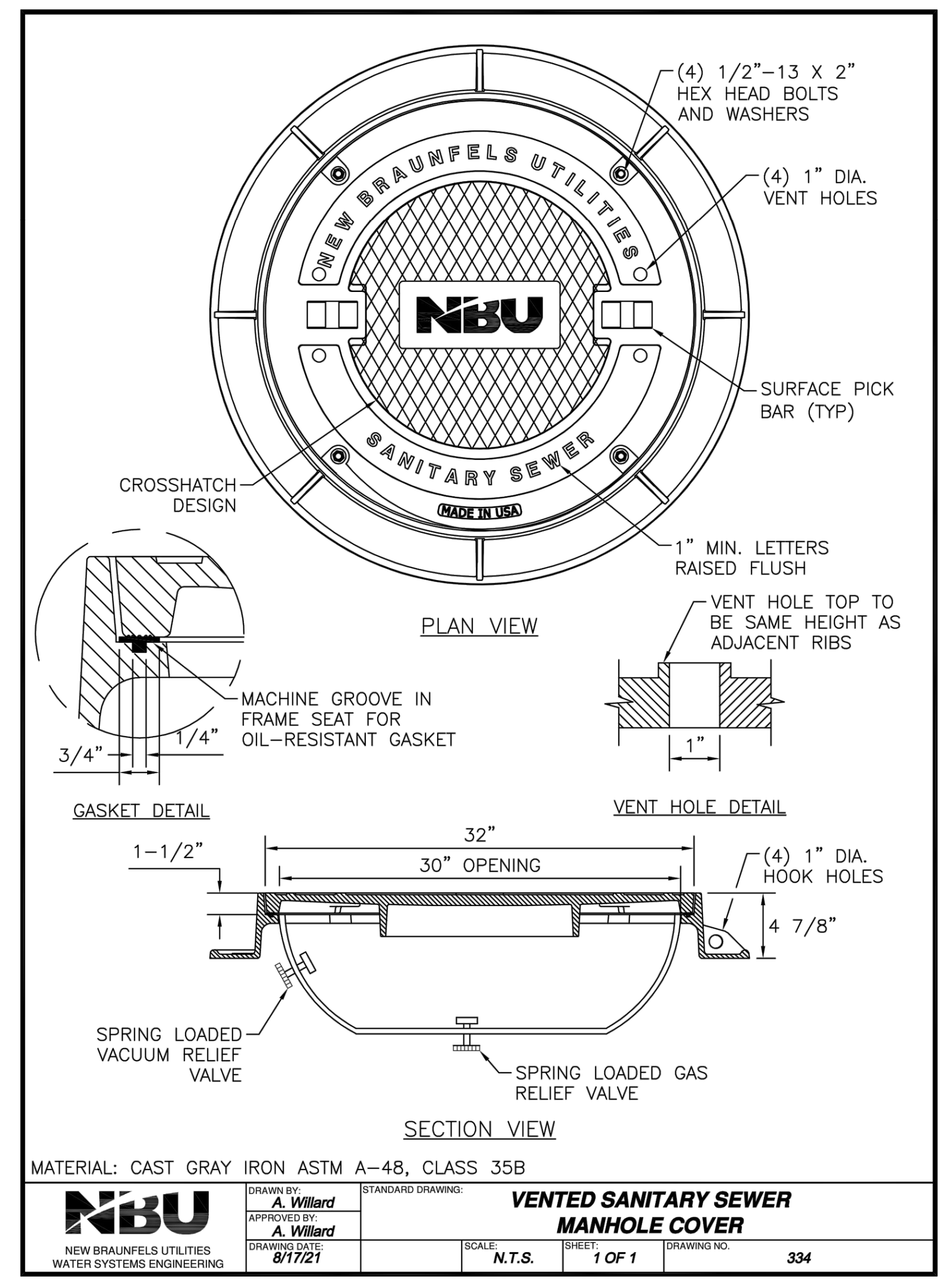
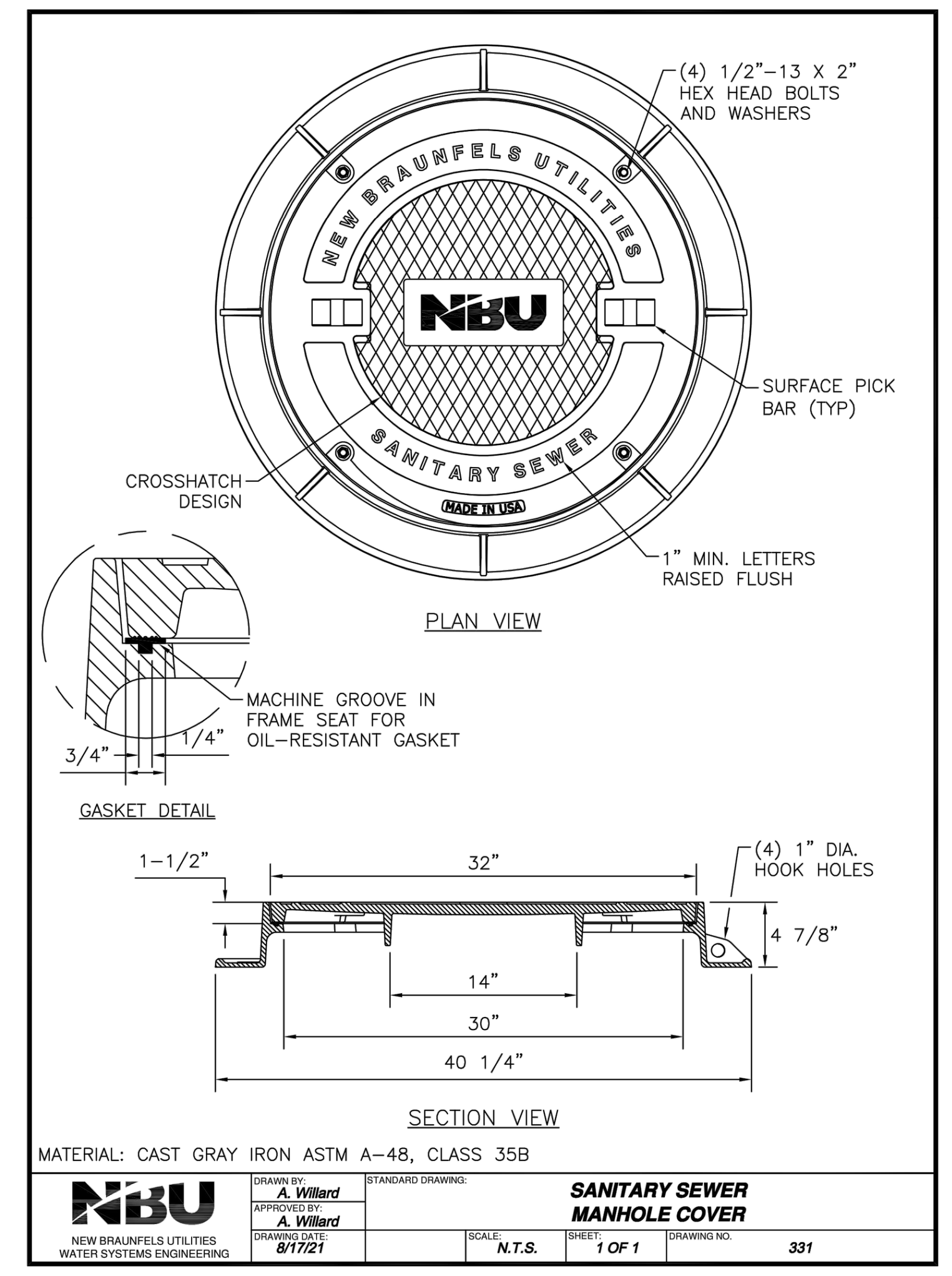
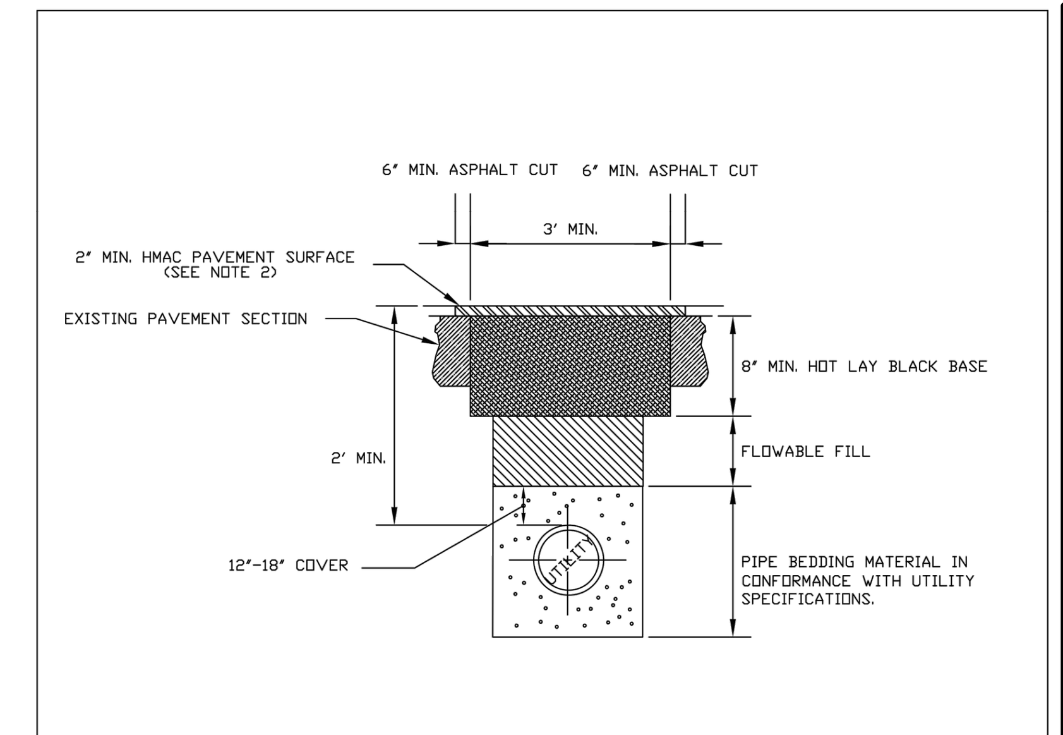










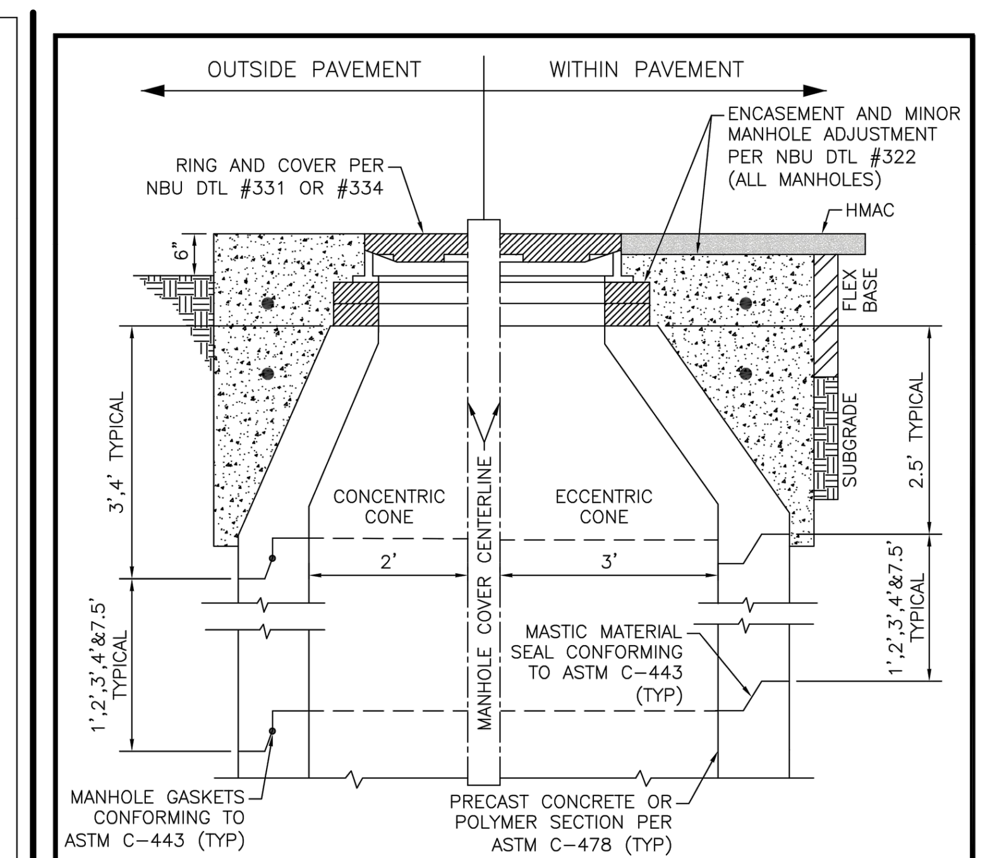
NOTES:

1. 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.
2. REPLACEMENT HMAC SURFACE LAYER SHALL BE OF THE TYPE AND THICKNESS BASED ON FUNCTIONAL CLASSIFICATION.
   A) MIN. 2"HMAC TYPE "D"FOR TRENCH REPAIRS IN LOCAL/RESIDENTIAL STREETS.
   B) MIN. 3"HMAC TYPE "C"FOR TRENCH REPAIRS IN COLLECTOR/ARTERIAL STREETS.
3. DAMAGED PAVEMENT OUTSIDE THE TRENCH CUT SHALL BE REMOVED AND REPLACED
4. PRIME AND TACK COAT ALL EXPOSED EDGES AND SURFACES.
5. HOT LAY BLACK BASE LAYED IN 8"LIFTS @ 95% COMPACTION.
6. 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.
7. CALICHE OR EXISTING MATERIAL SHALL NOT BE USED TO BACKFILL THE UTILITY EXCAVATION.

TRENCH REPAIR DETAIL		CITY OF NEW BRAUNFELS ENGINEERING DIVISION 424 S. CASTELL AVE. NEW BRAUNFELS, TEXAS 78130 PHONE: 830 221 4020 FAX: 830 626 3600
ISSUE DATE: APRIL 2015	SCALE: N.T.S	
DRAWN BY: AMF	CONTACT: GF	

SANITARY SEWER PIPE LAID IN TRENCH (WITHIN PAVEMENT)

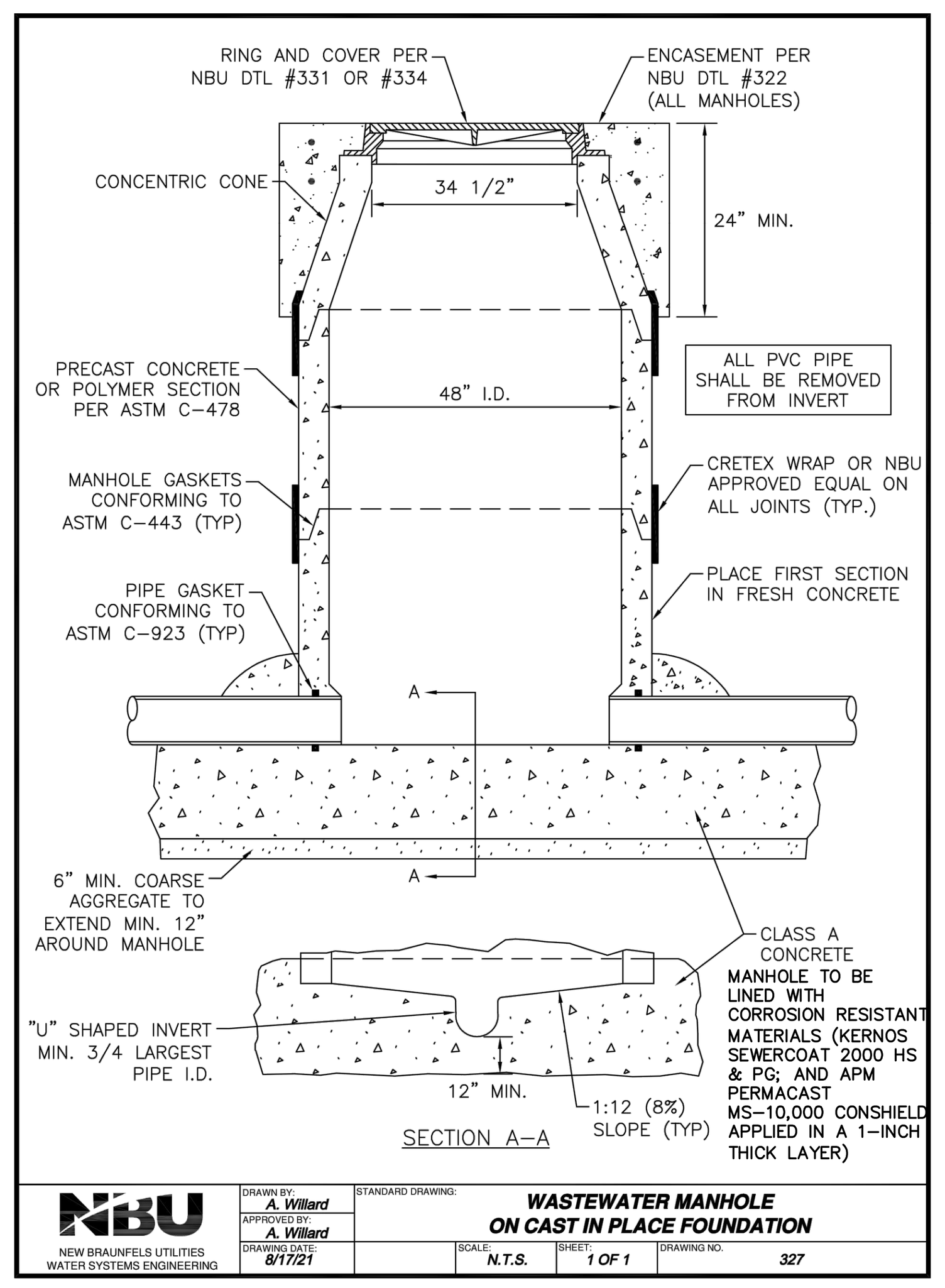
NOT TO SCALE

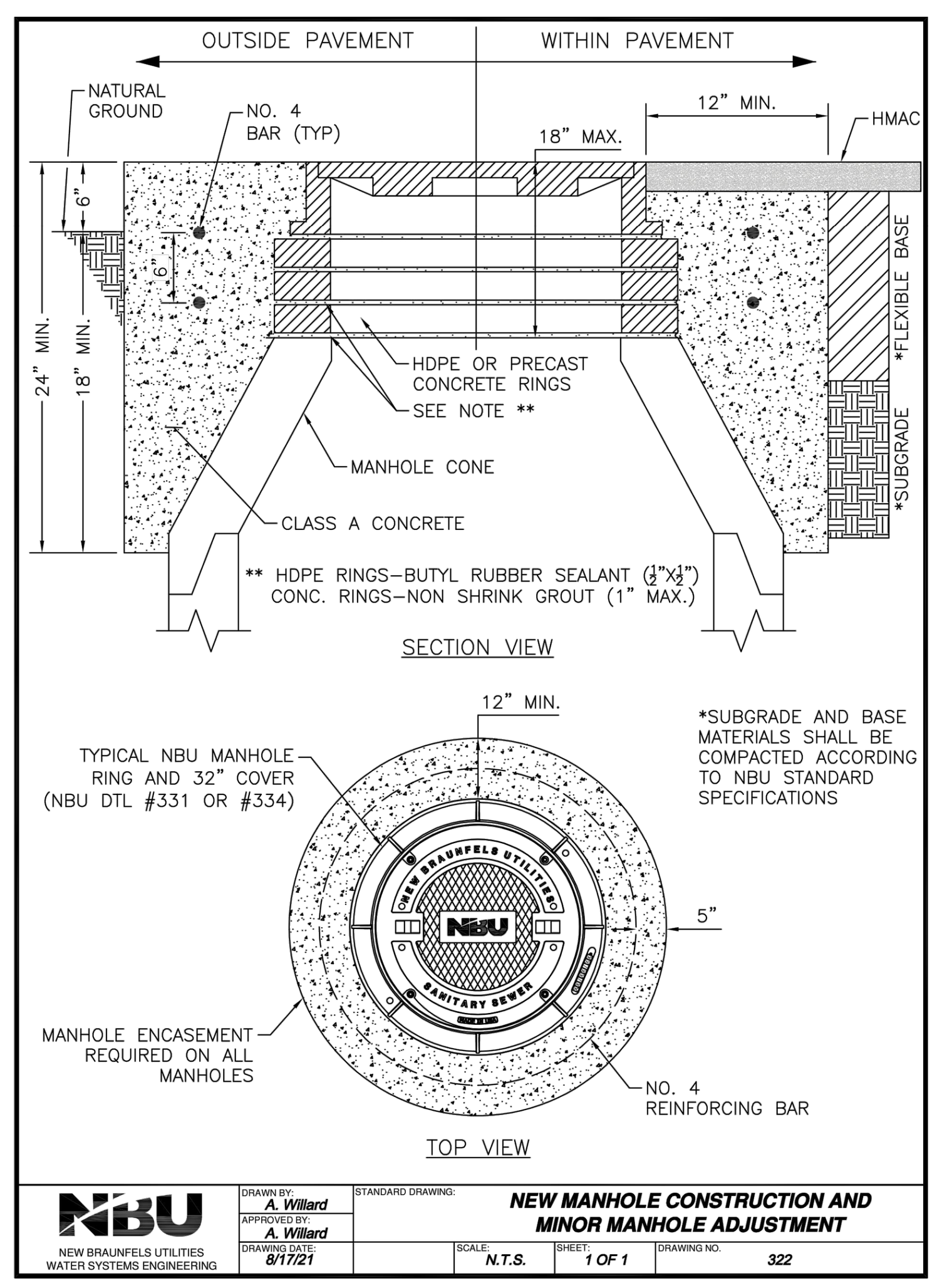


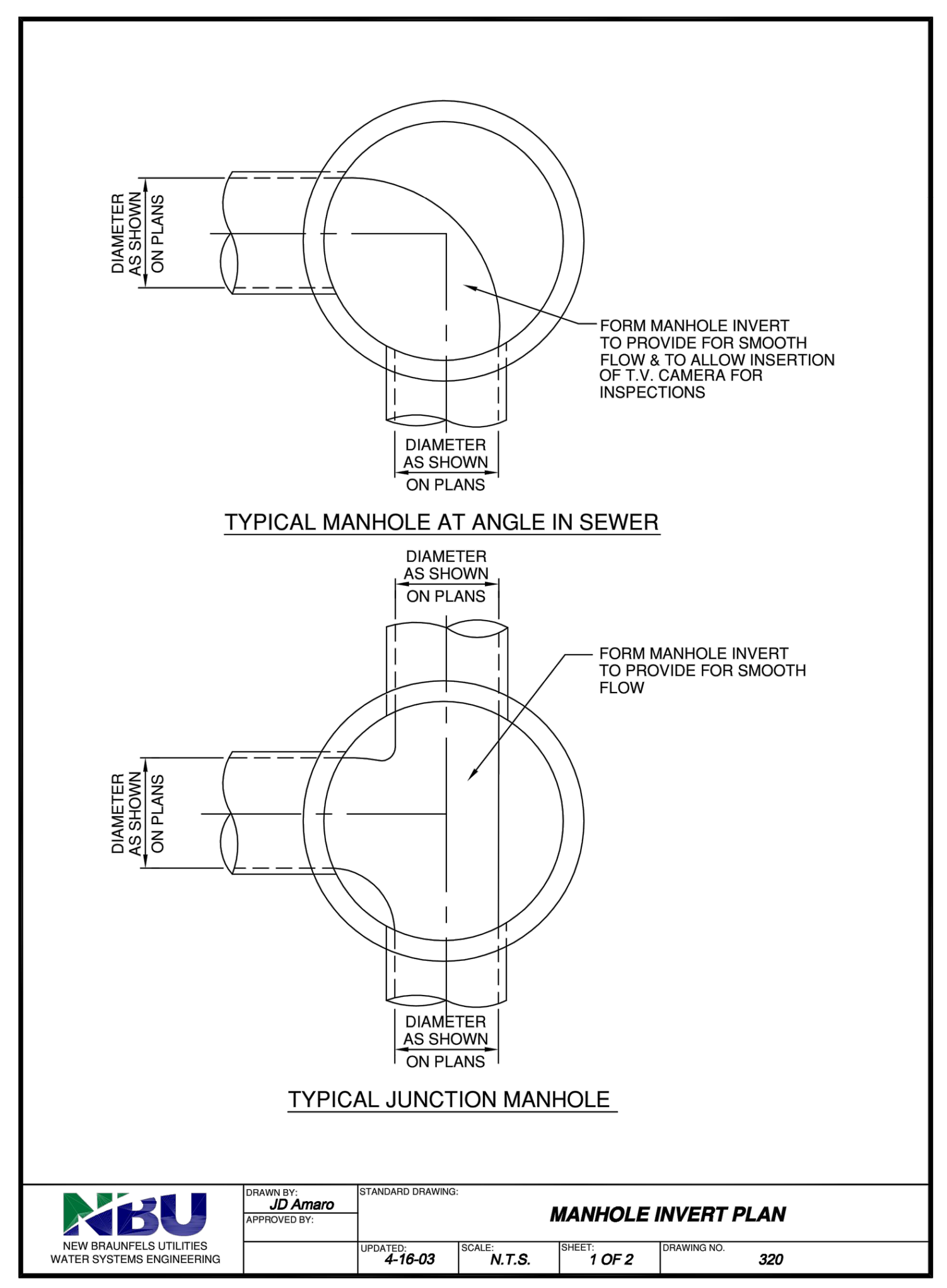
NOTES:

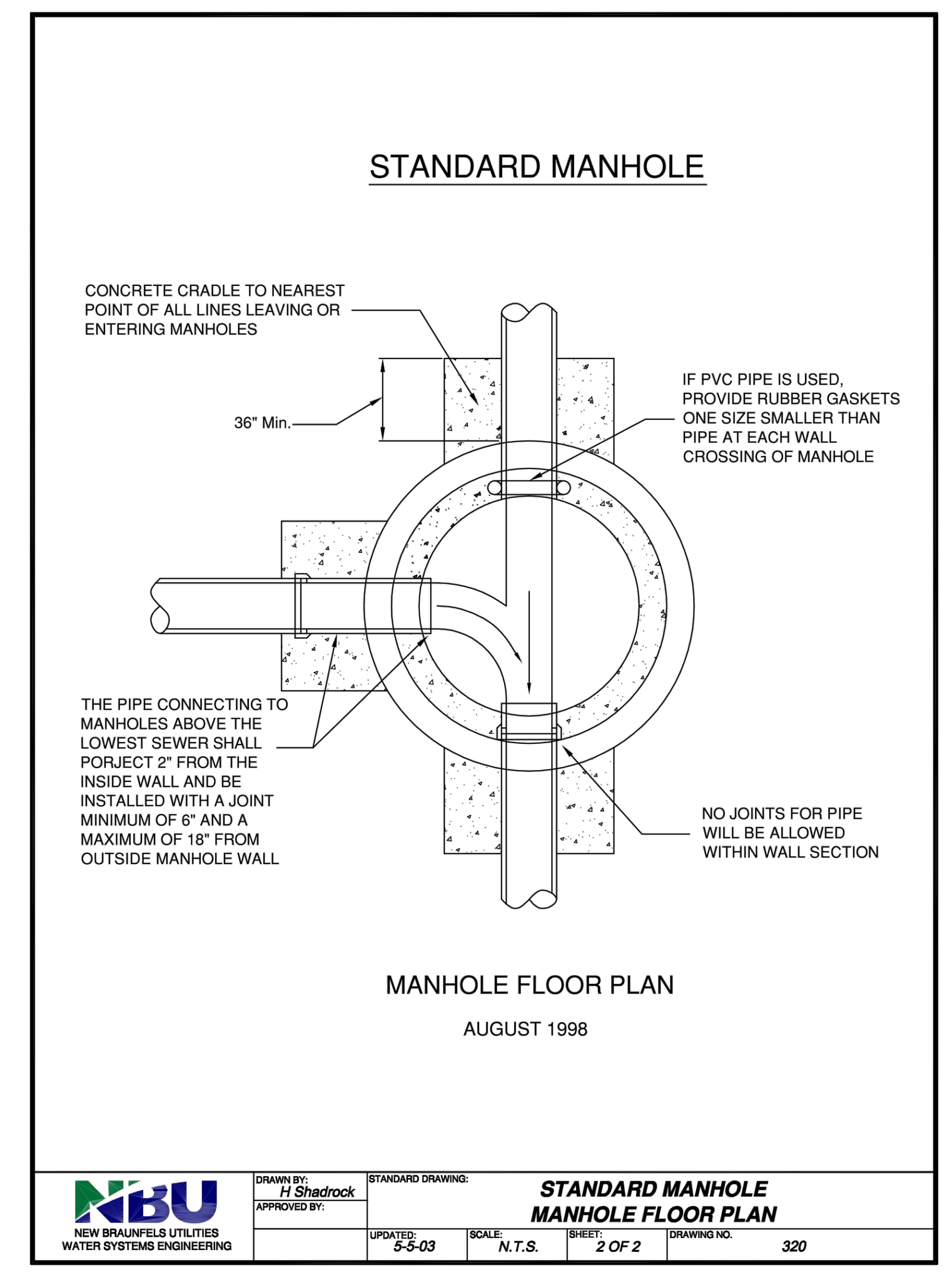
1. MANHOLE SECTIONS TEMPORARILY REMOVED FOR ROADWAY CONSTRUCTION MAY BE REUSED ONLY WITH THE WRITTEN APPROVAL OF THE INSPECTOR. GASKETS SHALL NOT BE REUSED.
2. ANY COMBINATION OF REMOVING THE CONCRETE RINGS, AND / OR THE MANHOLE CONE, AND/OR THE STRAIGHT RISER SECTION OF THE MANHOLE SHALL BE ACCEPTABLE TO TEMPORARILY LOWER THE MANHOLE GRADE FOR ROADWAY RECONSTRUCTION.
3. WHILE THE MANHOLE IS TEMPORARILY LOWERED, A SHEET OF STEEL SUITABLE TO SUPPORT ALL IMPOSED LOADS SHALL BE USED TO COVER THE OPENING. THE STEEL PLATE SHALL BE SET IN MORTAR TO PREVENT LEAKAGE.
4. SUBGRADE AND BASE MATERIALS SHALL BE COMPACTED TO 95% AND 100% DENSITIES, RESPECTIVELY, COMPACTION SHALL BE BY MECHANICAL TAMPING TO THE DENSITIES SPECIFIED.
5. MANHOLE SHALL BE SET SO RING AND COVER MATCH STREET SLOPE.

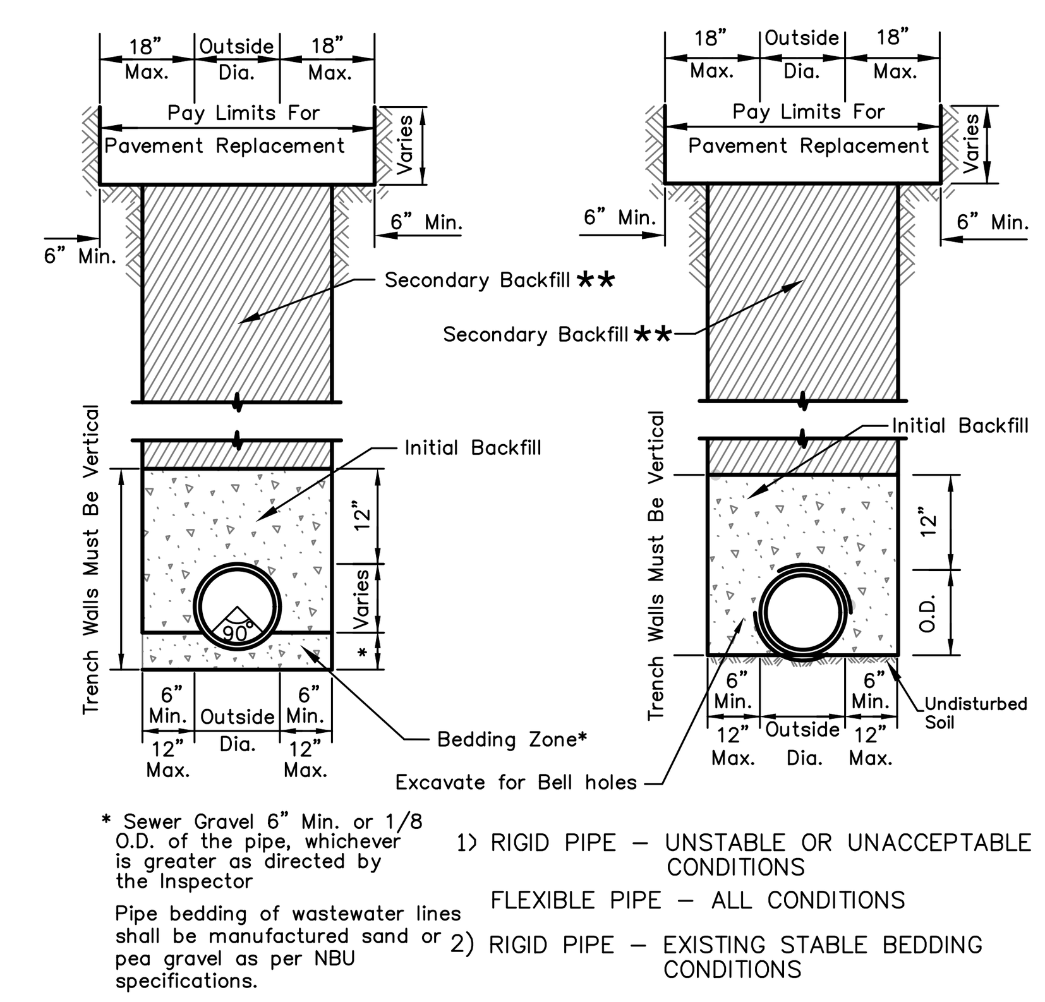
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWN BY: A. Willard APPROVED BY: A. Willard DRAWING DATE: 8/17/21	STANDARD DRAWING: MAJOR MANHOLE ADJUSTMENT	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO. 321











** 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

CITY OF NEW BRAUNFELS NOTES

1. NO VALVES, HYDRANTS, ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.
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.
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NO.	REVISION	DATE

5-16-2024
STATE OF TEXAS — JOCELYN PEREZ — 98367 — LICENSED PROFESSIONAL ENGINEER

PAPE-DAWSON ENGINEERS
1672 INDEPENDENCE DR, STE 102 | NEW BRAUNFELS, TX 78132 | 830.632.5633
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

VERAMENDI S8-S10
NEW BRAUNFELS, TEXAS
SANITARY SEWER DETAILS

PLAT NO.
JOB NO. 30001-80
DATE MAY 2024
DESIGNER CK
CHECKED CK DRAWN MG
SHEET C1.20

Date: May 16, 2024, 10:02 AM – User ID: MConcepcion
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